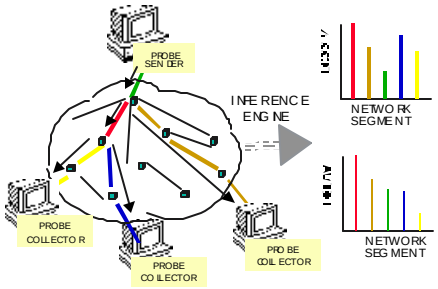
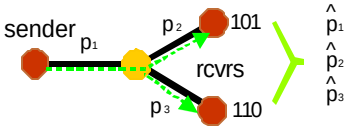
Network measurement

http://www-net.cs.umass.edu

MINC: Multicast Inference of Network-Internal Characteristics

- Goal: link-level characteristics from end-end measurements
- network management, adaptive app's
- multicast -> correlated traces
- exploit correlation to infer performance





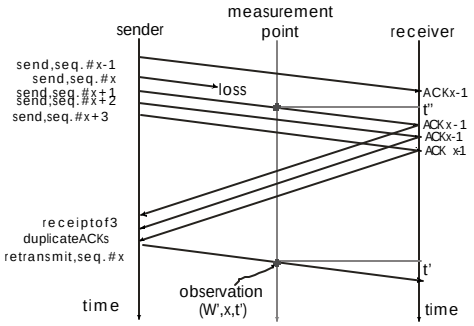
Results:

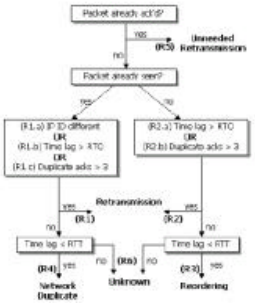
- link-level performance estimators
- topology identifiers
- unicast extension
- validation, NIMI implementation

Measurement in the Middle:

infer end-end performance from measurements taken at single point within network

- large number of flows observable
- MINC-like inference using aggregate traffic
- challenge: inferring sender state





Current Work:

- characterizing out-of-sequence packets in Sprint backbone
- 14M flows, 3,400 AS
- 5% packet mis-sequencing, few pathologies

Continuous-time Hidden Markov Models:

- Goal: model complex end-end behavior using Markov model, traces
- use in simulation: trace-based and model-driven
- performance measures: end-end delay, loss
- infer CTHMM model parameters from traces: EM algorithm