ApplTestTool

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- application layer traffic generators
- used for testing protocols and wireless communication models
- modules
  - Script Appl Layer – scripted unit tests
  - Ensemble Appl Layer – statisitcal tests
  - Oracle Routing – neighbor management (static)
  - also methods and tools – make things easier

- simple transmit scenarios with timing constraints
  - `time`, `src-host`, `dest-host`
- generate unit tests systematically
  - e.g. host[0] receives frame during backoff
  - e.g. host[1] senses channel during host[0] rx-tx turnaround
- check results (log and .sca/.vec files) manually
  - make notes; use omnet config and script tools
  - use large timing values, large differences
  - little bit of trial and error on timing (rng)

- statistical tests - scaling behavior
- synchronized transmission
  - backoff statistics
- exponential interarrival times
  - broadcast, central host, or random neighbor
- tests
  - memory leaks
  - internal consistency of statistics

Results

SICS

- implementation
  - trivial
  - mobility-fw (omnet++3.x)
  - MiXiM (omnet++4.x)
- ucsma (incl. IEEE 802.15.4 for mobility-fw)
  - 94 unit tests
  - issues in ucsma, also existing SnrDecider, SnrEval
  - often highlights ambiguity in specificication
- MiXiM
  - issues in ieee802154Narrow

- random number generators
  - much better in opp4
  - non-random numbers
- dummy hosts (multiple kinds)
  - create interference
- cross layer control
  - set frame parameters from applLayer
- community commitment to testing and tools
  - include tests with release