Evaluation of the BRuIT protocol

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Architectures de Réseaux de Services
Context: QoS for ad hoc networks

- Ad hoc networks
  - IEEE 802.11
  - Medium overloaded
    - Unpredictable use of the radio medium

- QoS for ad hoc networks
  - Mechanisms to provide guarantees
  - BRuIT [Chaudet and Guérin Lassous, EW 2002]
    - Bandwidth Reservation under Interferences
BRuIT

- Share of the medium with 802.11
  - Carrier sensing range
  - Twice the communication range
    - Simulation / experimentation (at 2Mb/s)

- Principles of BRuIT
  - Routing + reservation
    - On-demand: AODV-like
    - Flooding of a request
    - Admission control
    - Reply on the reverse path + reservation
  - Admission control
    - Used bandwidth per node: all the traffic on the 2-hop neighborhood
Why two hops?

- Two hops ≠ twice the communication range
- How many nodes are undetected?
  - Random geometric graphs

One hop - Max: 70%

Two hops - Max: 50%
Why not three hops?

undetected
Max: 48 %

“Over-detected”
Max: 40%
Evaluation of BRuIT

- **Simulation**
  - NS-2 version 2.27
  - Random geometric graphs from 10 to 100 nodes
  - 5 to 30 flows of 80kbit/s
  - Average over 100 simulations
  - Comparison with AODV
    - Impact of admission control
    - Impact of guarantees

- **Admission rate of BRuIT**
  - Between 50% and 60% compared to AODV
  - The difference increases with the network load

- **Establishment time**
  - Around 100 ms
  - Between 20% and 40% slower than AODV
Evaluation of BRuIT

- **Route length**
  - Between 50% and 100% longer than the shortest path (AODV 10% longer than the shortest path)
  - Load balance with BRuIT

- **Signaling load**
  - Comparable
    - BRuIT: Hello packets
    - AODV: Route reconstruction
  - BRuIT more stable

- All the curves are available in the paper