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Experiments of some performance issues with IEEE 802.11 in ad hoc networks

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Context and objective

■ Context

- Ad hoc networks
- 802.11 (DCF mode)
- Performance issues with 802.11 in ad hoc context
 - Simulation results
 - Few experimental results

■ Objective

- Are the performance issues of 802.11 still exist in real ad hoc networks?



Performance issues with 802.11

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- When the medium is overloaded
- Three main categories
 - Long time unfairness
 - Short time unfairness
 - Overall performance degradation

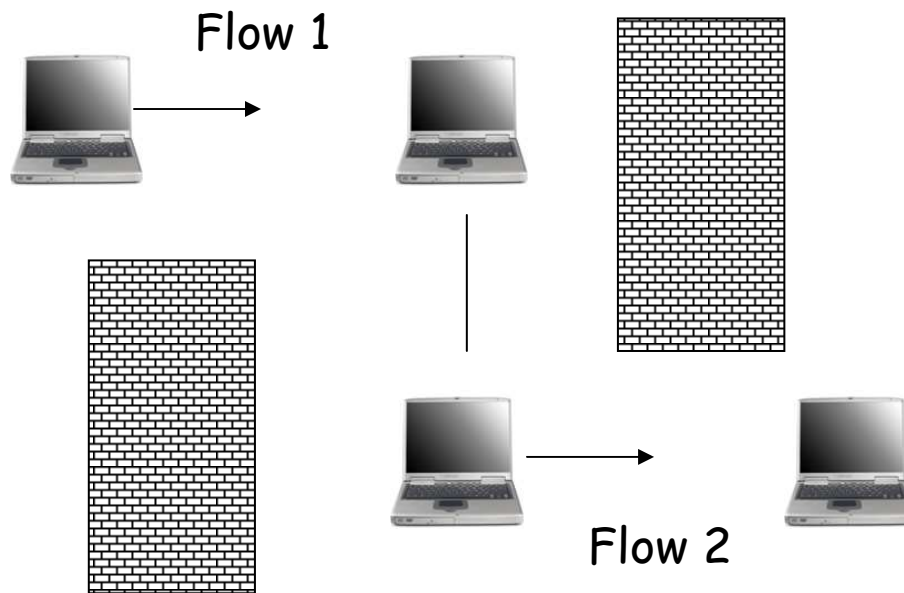


Experimental framework

- **Forwarding**
 - Broadcast and unicast packets
 - 2 / 11 Mb/s
- **Simulator NS2**
 - Modified AODV
 - Static routing
 - 2 / 11 Mb/s
- **Long and short term unfairness**



Another impact of the hidden node configuration

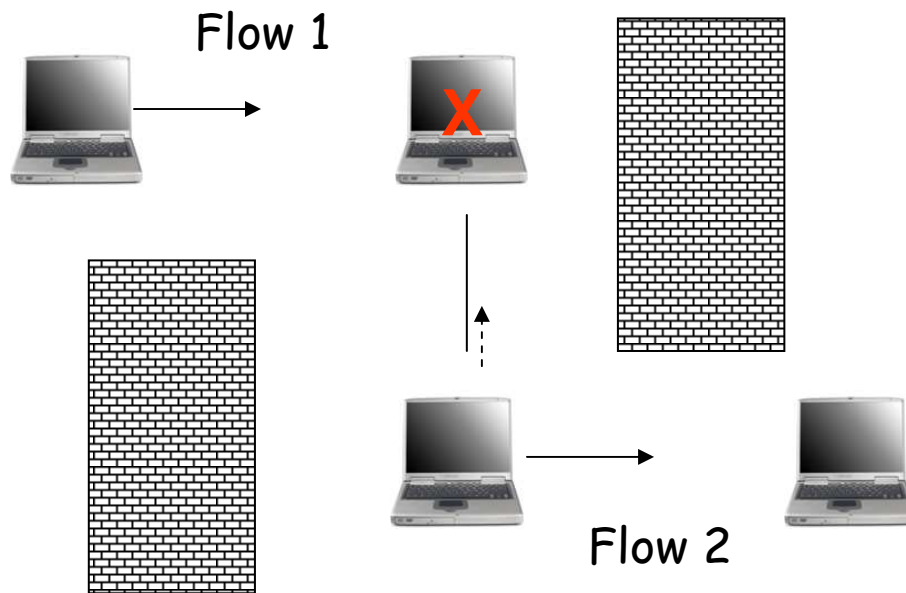


Bensaou et al. 2000

The rate of Flow 1 is very low, even if higher with RTS/CTS



Another impact of the hidden node configuration

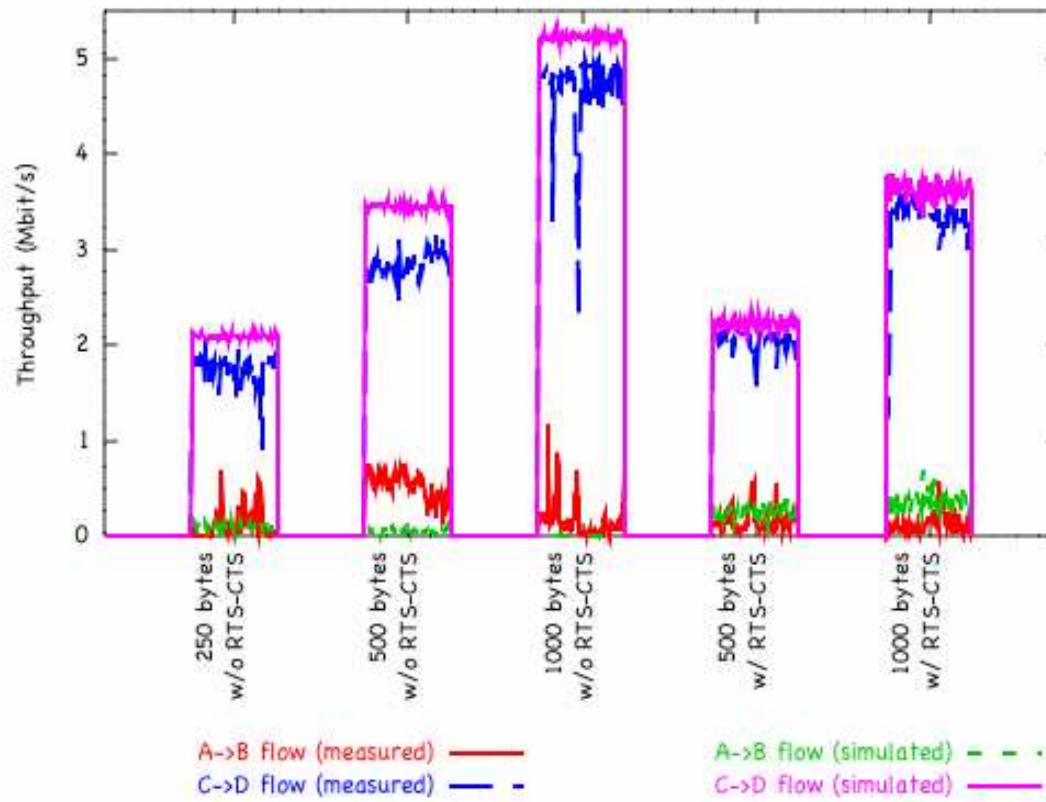


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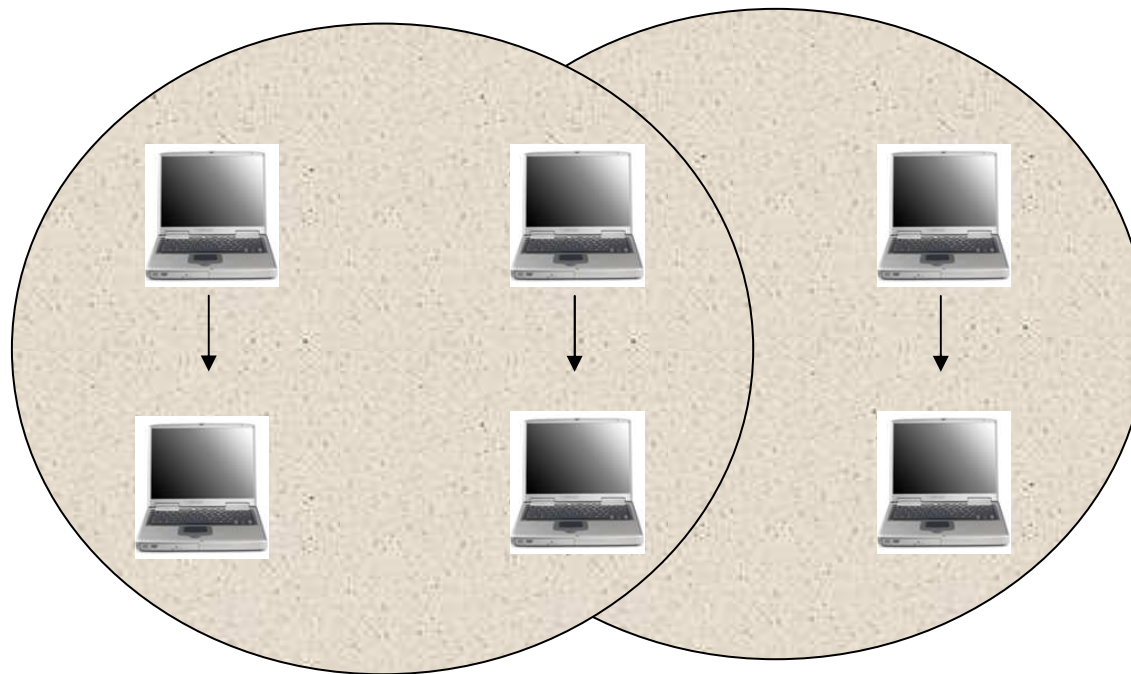


Results





The three pairs scenario



Dhoutaut and Guérin 2002

The rate of the central pair is very low



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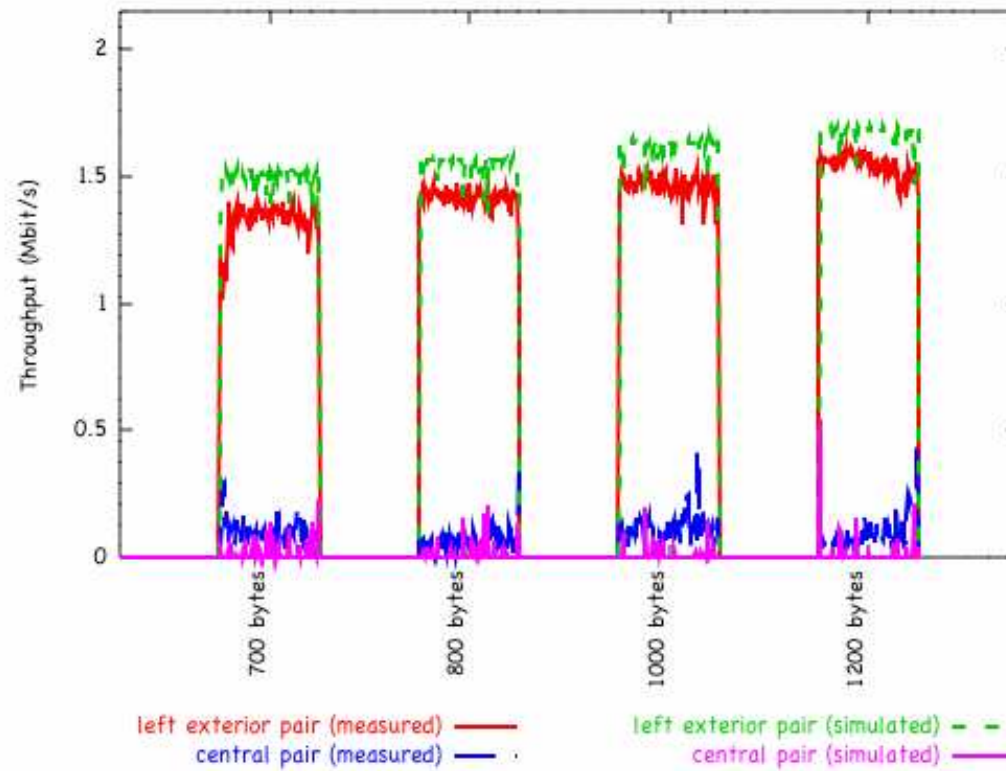
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Results

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Conclusion

- Evaluation of some performance issues with 802.11 in real multihop wireless networks
- The tested scenarios are less unfair in practise

- It seems that the EIFS is not triggered
- Radio instability
- Capture effect



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