

École d'été RESCOM 2014

On Estimating the End-to-End Bandwidth in Multi-Transceiver Multi-Hop Cognitive Radio Networks

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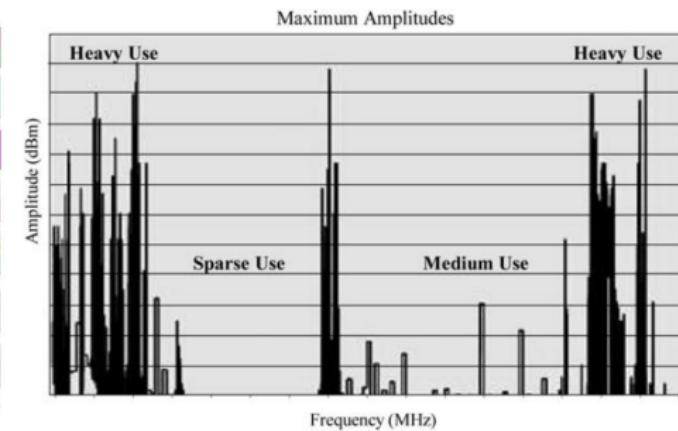
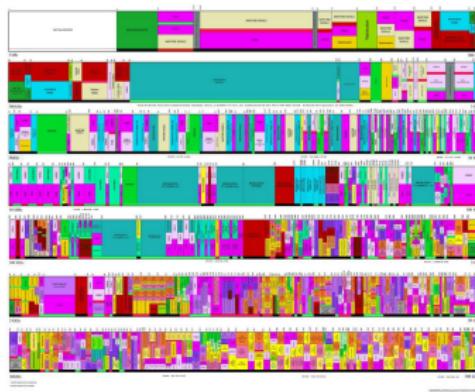


A brief overview of Cognitive Radio networks (1/2)

Emergence of Cognitive Radio networks

- ① Software Defined Radio technologies
- ② Increasing demand for wireless capacity

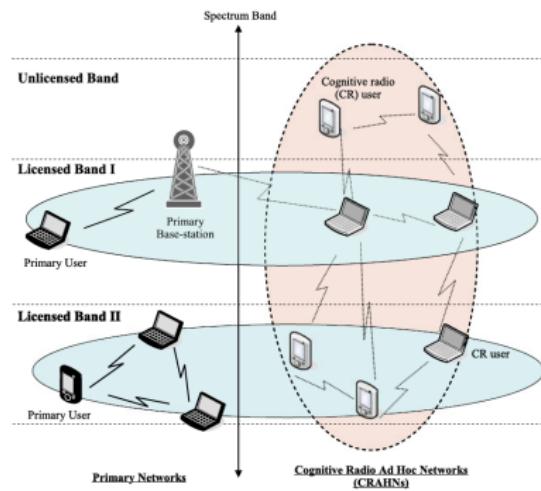
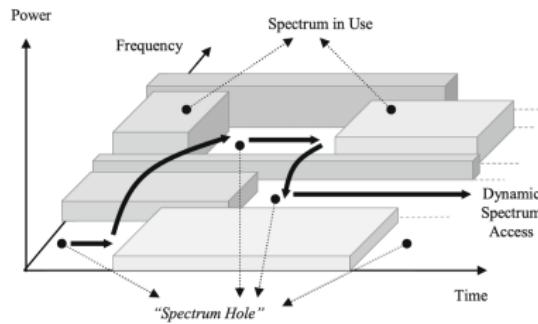
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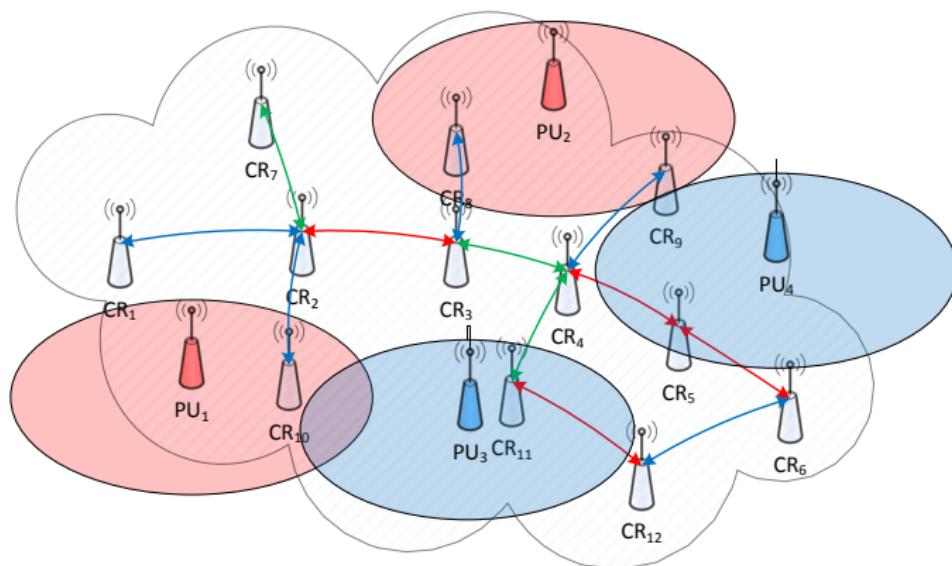
A brief overview of Cognitive Radio networks (2/2)

Cognitive Radio principle

- Fixed Spectrum Allocation \Rightarrow **Dynamic Spectrum Access**
- Opportunistic Spectrum Access based on Spectrum Sensing result



Problem & Contribution (1/2)

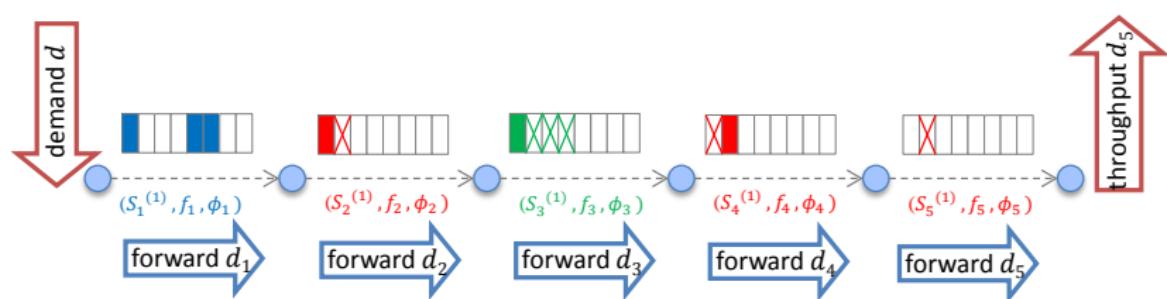


⇒ Available end-to-end bandwidth estimation in TDMA-based multi-transceiver multi-hop cognitive radio networks

Problem & Contribution (2/2)

Cognitive Radio network characteristics

- Intra-path interferences
- TDMA access with Randomized slot scheduling



Main Contribution

⇒ Centralized Exponential Time to **Distributed Linear Time** algorithm

Results & Performance Evaluation

Achievable End-to-End Throughput

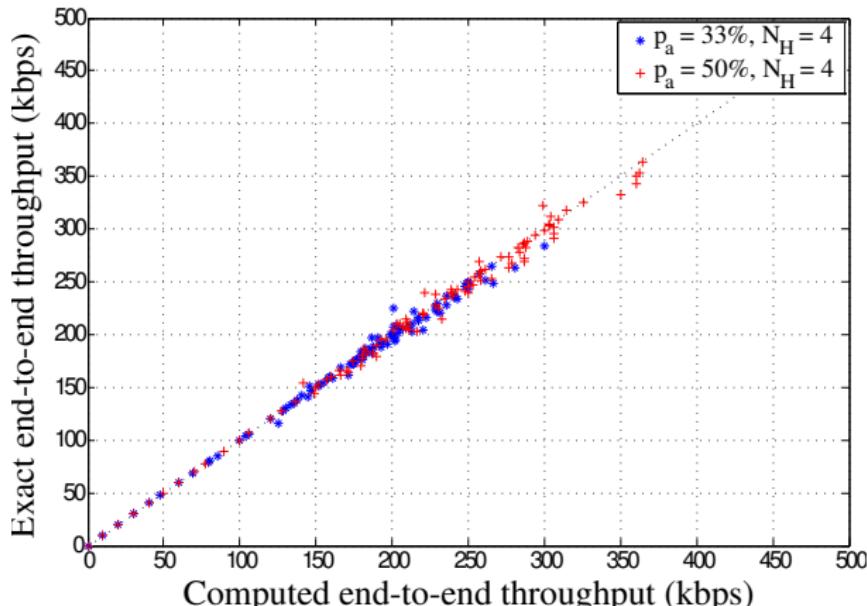


FIGURE 1: Numerical verification for $u = 10\%$ of the correctness of the algorithm for computing the average throughput.

Results & Performance Evaluation

Admission Control Performance

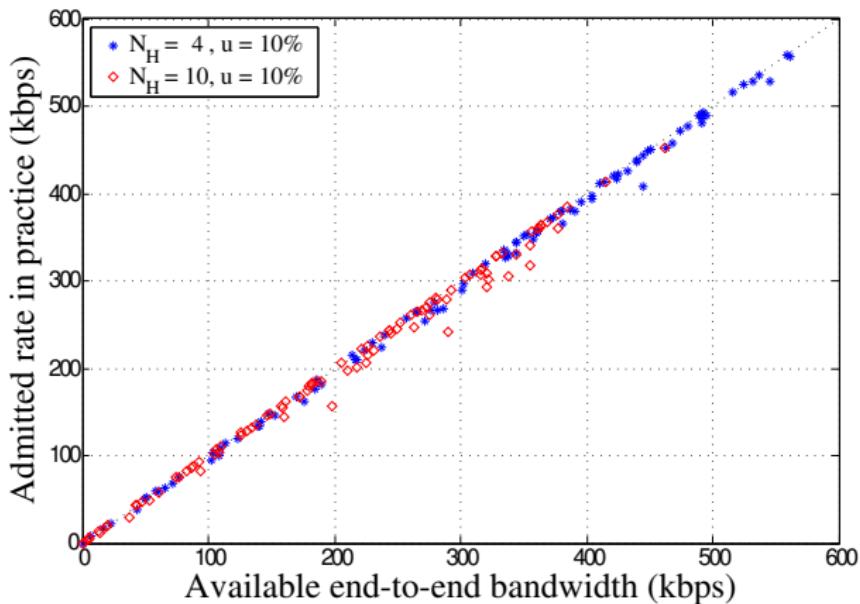


FIGURE 2: Admission control performance for the case of $u = 10\%$ after only 10 numerical experiments.

Results & Performance Evaluation

Cognitive Radio Effect

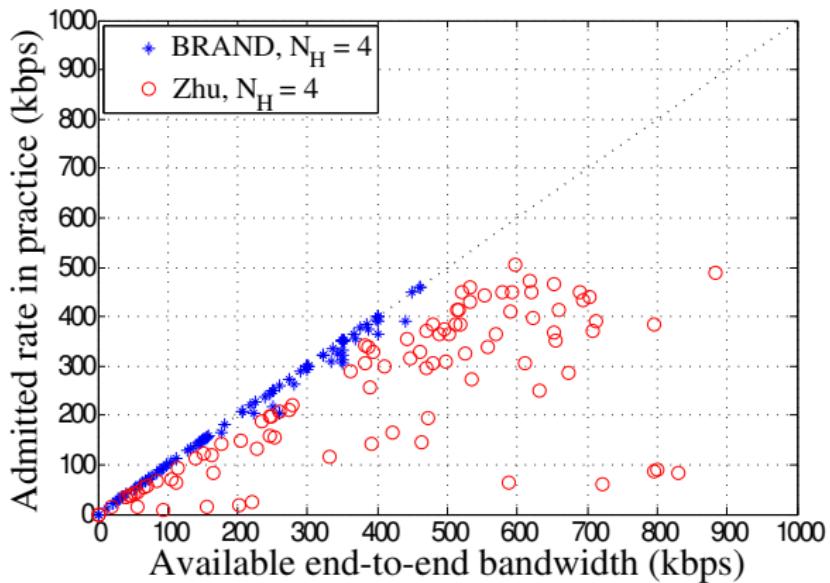


FIGURE 3: Evaluation of both PU activity and multi-rates effects for the cases of $u = 20\%$.

Questions ?