

**STABILITY AND DYNAMIC CONTROL OF  
UNDERLAY MOBILE EDGE NETWORKS**

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# ABSTRACT

- This paper studies the stability and dynamic control of underlay mobile edge networks. First, the stability region for a multiuser edge network is obtained under the assumption of full channel state information. This result provides a benchmark figure for comparing performance of the proposed algorithms.
- Second, a centralized joint flow control and scheduling algorithm is proposed to stabilize the queues of edge devices while respecting the average and instantaneous interference power constraints at the core access point. This algorithm is proven to converge to a utility point arbitrarily close to the maximum achievable utility within the stability region.



## CONT....

- Finally, more practical implementation issues such as distributed scheduling are examined by designing efficient scheduling algorithms taking advantage of communication diversity. The proposed distributed solutions utilize minislots for contention resolution and achieve a certain fraction of the utility optimal point.
- The performance lower bounds for distributed algorithms are determined analytically. The detailed simulation study is performed to pinpoint the cost of distributed control for mobile edge networks with respect to centralized control.



## EXISTING SYSTEM

- In the previous section, we characterize the stability region by obtaining maximum rates that an interference-aware edge network can support. In this section, we will present a dynamic control algorithm that will solve a NUM problem while stabilizing the network layer queues in an edge network.
- To do so, we follow a cross-layer design approach. In the lower layer, the scheduling policy ensures network stability and satisfies the interference requirements.

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# PROPOSED SYSTEM

- The proposed algorithm will be called Channel-Aware Distributed Scheduler (CADS) that operates based on the local queue size and channel state information at each edge device pair.
- Obtain analytical performance bounds on the dynamic control of the edge network based on the proposed channel aware distributed schedulers. Now, the utility optimal point achieved through a centralized scheduler can no longer be guaranteed due to availability of limited information in the distributed mode of operation.

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# HARDWARE REQUIREMENTS

- Processor - Pentium-IV
- Speed - 1.1 Ghz
- RAM - 256MB(min)
- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

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## SOFTWARE REQUIREMENTS

- Tool - Network Simulator-2
- Operating system - LINUX
- Front end - OTCL (Object Oriented Tool Command Language)

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# REFERENCES

- [1] Cisco, “Cisco Visual Networking Index: Global Mobile Data Traffic Forecast, 2015-2020,” White Paper, Jan. 2016.
- [2] M. Chiang and T. Zhang, “Fog and IoT: An overview of research opportunities,” IEEE Internet Things J., to appear.
- [3] R. Kelly, “Internet of things data to top 1.6 zettabytes by 2020,” Campus Technology, Accessed on Dec. 9, 2016.

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