# User-Centric Network MIMO With Dynamic Clustering

# ABSTRACT


- Recent advances have demonstrated the potential of network MIMO (netMIMO), which combines a practical number of distributed antennas as a virtual netMIMO AP (nAP) to improve spatial multiplexing of an WLAN. Existing solutions, however, either simply cluster nearby antennas as static nAPs, or dynamically cluster antennas on a per-packet basis so as to maximize the sum rate of the scheduled clients.
- To strike the balance between the above two extremes, in this paper, we present the design, implementation and evaluation of FlexNEMO, a practical two-phase netMIMO clustering system. Unlike previous perpacket clustering approaches, FlexNEMO only clusters antennas when client distribution and traffic pattern change, as a result being more practical to be implemented.

# CONT…

- A medium access control protocol customized for uplink transmissions is then designed to allow the clients at the center of nAPs to have a higher probability to gain uplink access opportunities, but still ensure long-term fairness among clients.
- By combining ondemand clustering and priority-based access control, FlexNEMO not only improves antenna utilization, but also optimizes the channel condition for every individual client. We evaluated our design via both test bed experiments on USRPs and trace-driven emulations. The results demonstrate that FlexNEMO can deliver 94.7% and 93.7% throughput gains over static antenna clustering in a 4-antenna test bed and 16-antenna emulation, respectively.

## EXISTING SYSTEM

Recent advances have investigated the advantages of multiuser MIMO (MU-MIMO) systems for both downlink and uplink scenarios. Later designs further involve multiple AP-client pairs in concurrent transmissions in a distributed way. The gain is, however, bounded by the maximal number of antennas at any node due to the lack of coordination.

# PROPOSED SYSTEM

FlexNEMO is a netMIMO system that flexibly clusters distributed antennas into several nAPs. The distributed antennas of a virtual MIMO node should be synchronized to avoid intercarrier interference in OFDM.

There have been many synchronization mechanisms, such as IEEE 1588 , proposed recently to meet this requirement. Our work can be combined with any of those synchronization approaches. The antennas in each nAP forward the received wireless samples to a backend server for decoding.

# 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

## SOFTWARE REQUIREMENTS

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

# REFERENCES

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[3] Q. Yang et al., “BigStation: Enabling scalable real-time signal processingin large mu-MIMO systems,” in Proc. ACM SIGCOMM, Aug. 2013, pp. 399–410.