Project Description: Software-defined WAM Systems can provide application-specific Quality-of-Service (QoS) to users, while also managing a dynamically changing environment.

- 5G networking environments (mobile broadband)
- Campus/University (WI-FI coverage over a campus)

Motivation: A plethora of technologies from Internet of Things (IoT) devices to smartphones, iPads, and laptops to Unmanned Air Vehicles (UAVs) and Small Satellites require interoperability and on-demand communication paths. Can overload centralized controller architecture.

Contributions:
- Developed hybrid distributed & decentralized controller architecture
- Develop controller optimization & placement model
- Poster Focus: Benchmarking to identify parameters that correlate with controller failure

Hybrid Distributed & Decentralized SDN Environment Summary

Parent Controller:
- Primary task of network management.

Child Controller:
- Primary task to monitor and secure the network

Blank, non-active controller: only initialized if a parent controller requires additional assistance or replacing

Distributed Store:
- Shared global view of all sub-regions.

Distributed approach integrates into wireless communication systems for improved resource management, and fault tolerance of mobile nodes

Distributed Northbound Interface

Round Trip Times

Packet Processor Service Times

Discussion: In larger network topologies, utilizing the distributed design can reduce LLDP and reactive packet processing times by 55% and 52% while the average and max RTT decreased by 44% and 61% in wireless scenarios.