

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

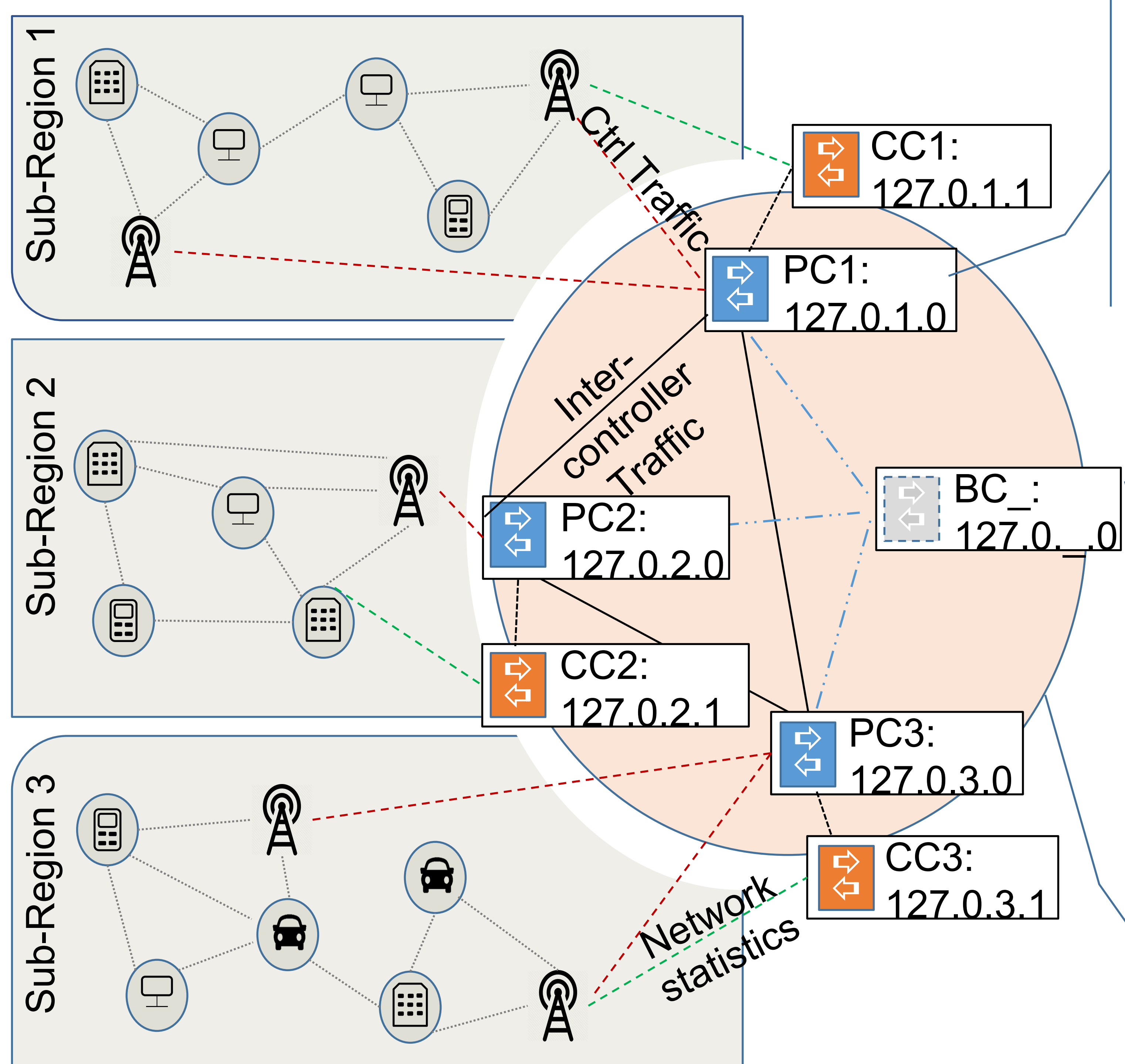
- 5G networking environments (mobile broadband)
- Campus/University (WI-FI coverage over a campus)

**Motivation:** A plethora of technologies from Internet of Things (IoT) devices to smart phones, 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

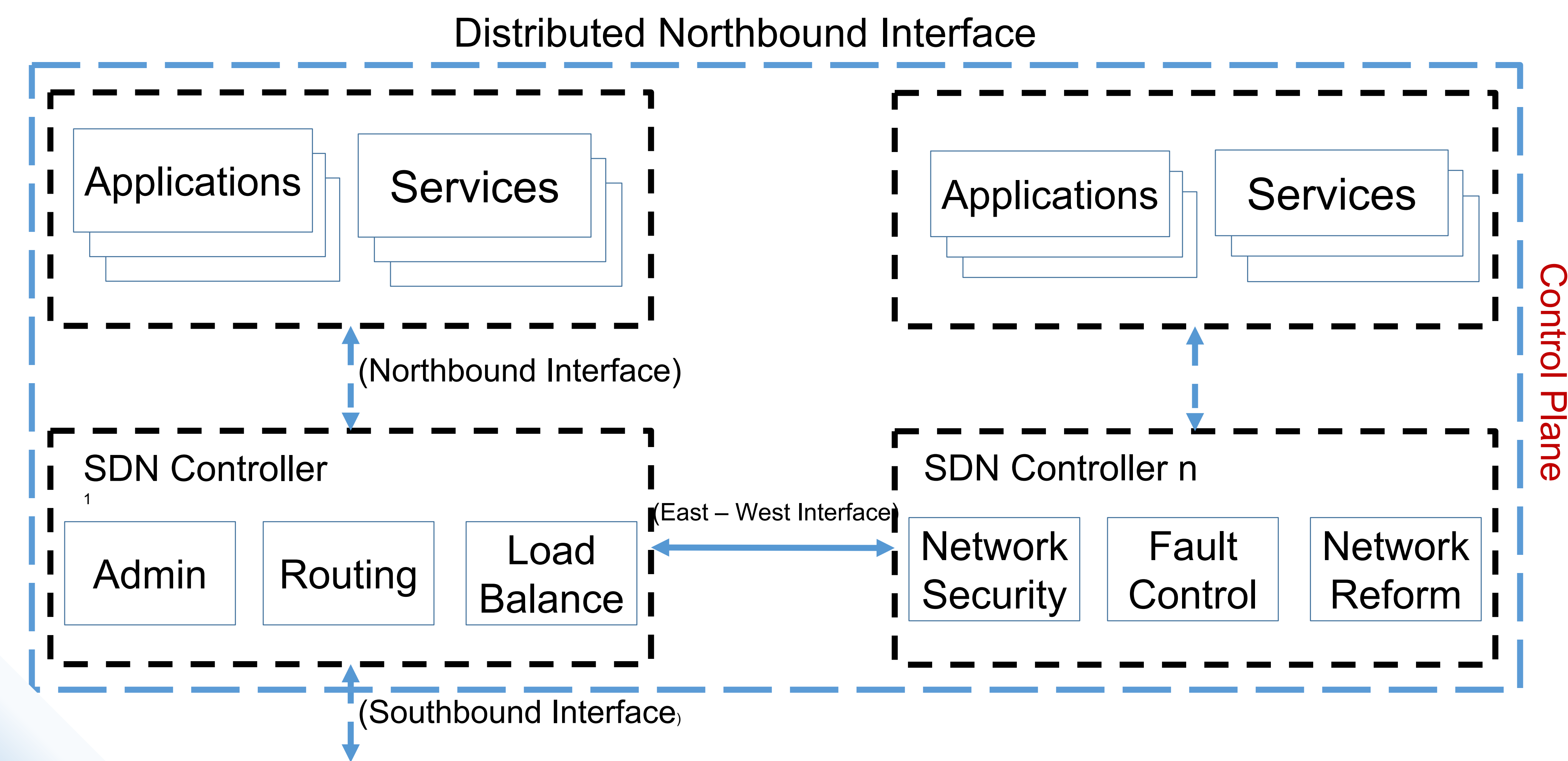
## Hybrid Distributed & Decentralized SDN Environment Summary



**Parent Controller:** Primary task of network management.  
**Child Controller:** Primary task to monitor and secure the network

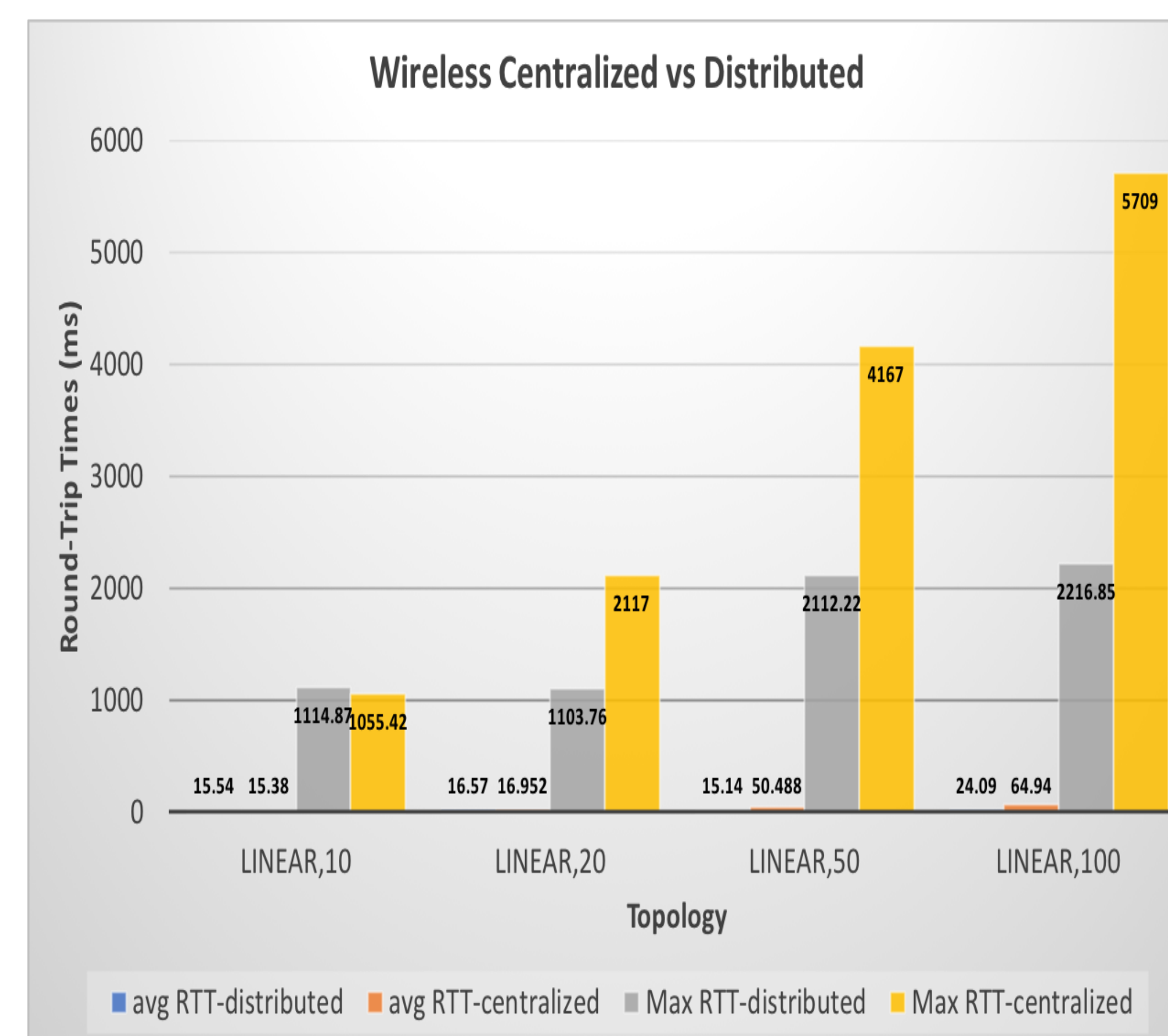
**Blank, non-active controller:** only initialized if a parent controller requires additional assistance or replacing

**Distributed Store:** shared global view of all sub-regions. Inter-controller communications

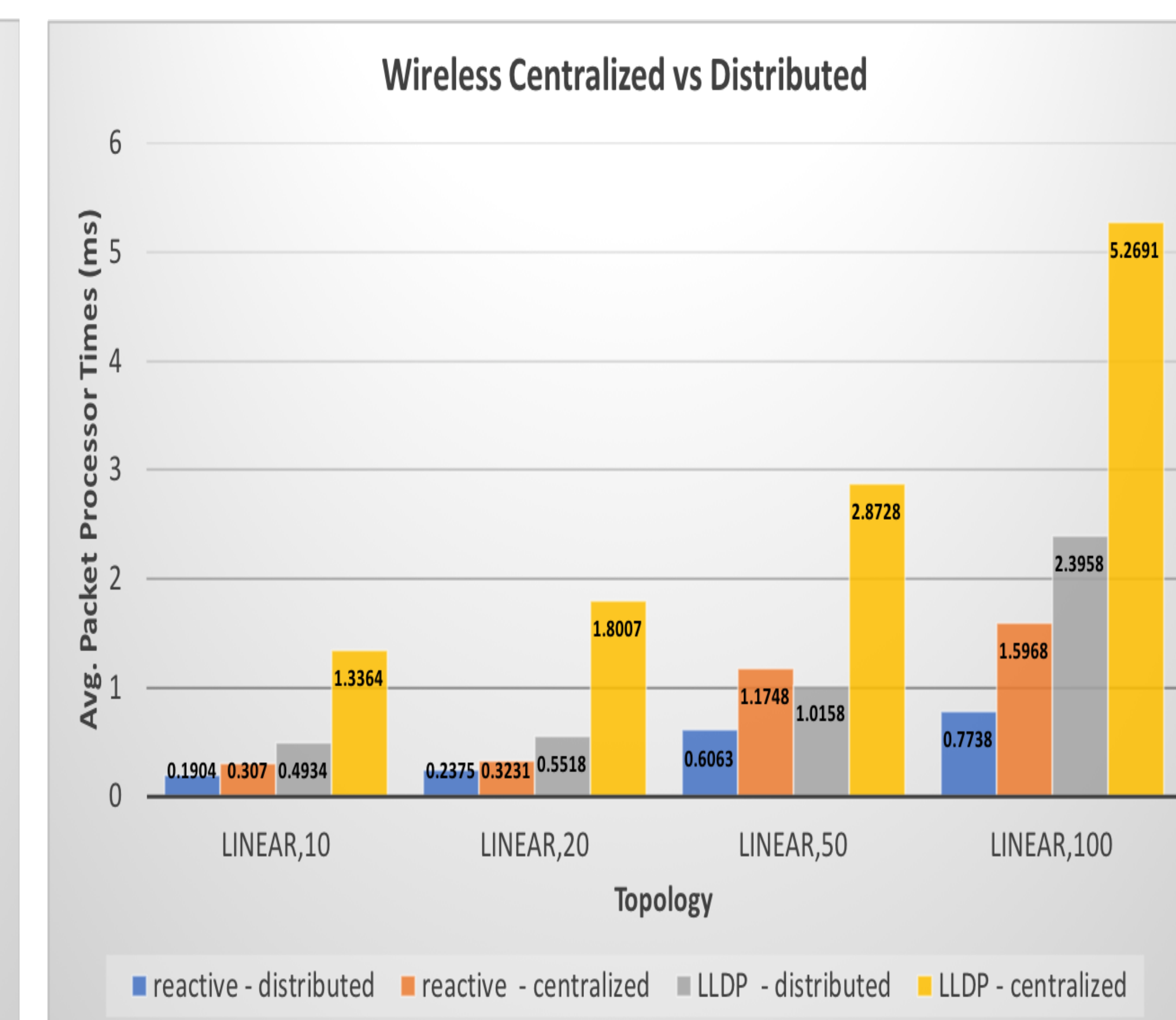


Distributed approach integrates into wireless communication systems for improved resource management, and fault tolerance of mobile nodes

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.