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Time Alignment over 5G Network Edge

Motivation:

In recent years commercial deployment of 5G networks has increased significantly, offering users a network with a much greater bandwidth, and lower latencies. This gives way to new possibilities for applications such as extended reality, industrial automation, autonomous vehicles, and IoT. For these applications to work, the network must support tight time synchronization to fully use the capabilities of 5G. For this to work, the important feature of 5G networks is to provide different network slices for the different classes of applications. As each application may require different timing requirements. So the goal for our project is to create this network slicing, to allow these different applications to all work simultaneously.

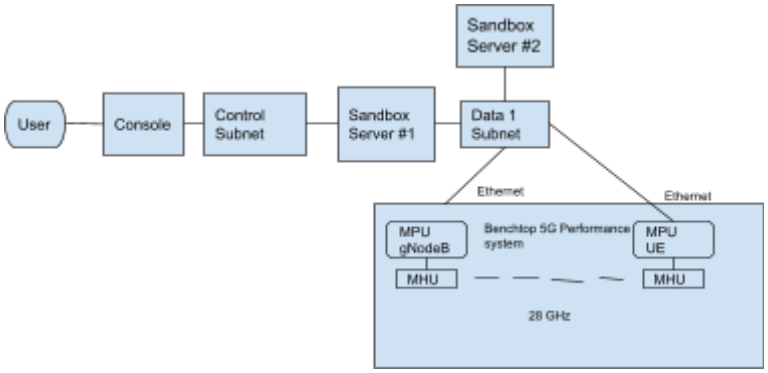
Design Goals:

The goal for our project is to characterize the basic time synchronization protocol, such as NTP, over different 5G network slices.

Deliverables:

The deliverables for our project are to simulate different 5G network slices using a hardware testbed. To characterize network propagation delays over the network slices we simulate, and then compare data-plane and control-plane exchange.

System Blocks:



HW/SW Requirements:

1. Sign up for a remote 5G testbed access
2. GUI Web Server
3. VPN Tunnel or SSH Tunnel

Team Members responsibilities:
Zachary Grimes - Networking, Writing
Robbe De Lange - Algorithm Design, Writing
Burak Yanbul - Research, Writing
Joseph Fitzgerald - Software, Writing

Project Timeline:
Week of 10/3: Background Research
10/10: Background Research + get familiar with 5G testbed
10/17: Testing 5G on Inter Digital System-Research for anything else
10/24: Start writing process - Still working on researching different material
10/31: Troubleshooting/debugging week
11/7: Keep testing different testbeds - working on robustness of code
11/14: Final tests data
11/21:Gather all data to include in write up - Making sure everything that is needed has been collected(data, research, links, etc)
11/28: Finalizing final paper- proofreading, working on graphs, and making the paper robust
12/5: Final draft

References:

[1] Getting Started with InterDigital 5G NR Performance System