CS4099 Demo

Ubiquitous Communication for the Internet of Things
An Identifier-Locator addressing split overlay network

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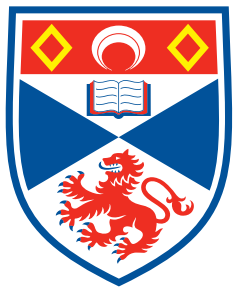


Background

- Ubiquitous Computing and the Internet of Things (IoT)
- Mobility in IP
  - Overloading of IP address semantics
  - Entanglement of layers
- Identifier-Locator Network Protocol (ILNP)

An Identifier-Locator Overlay Network

- Userspace and Python
- Focus on protocol design and interaction
- Evaluated with experimental analysis in IoT (Raspberry Pis)

Overlay Network Stack

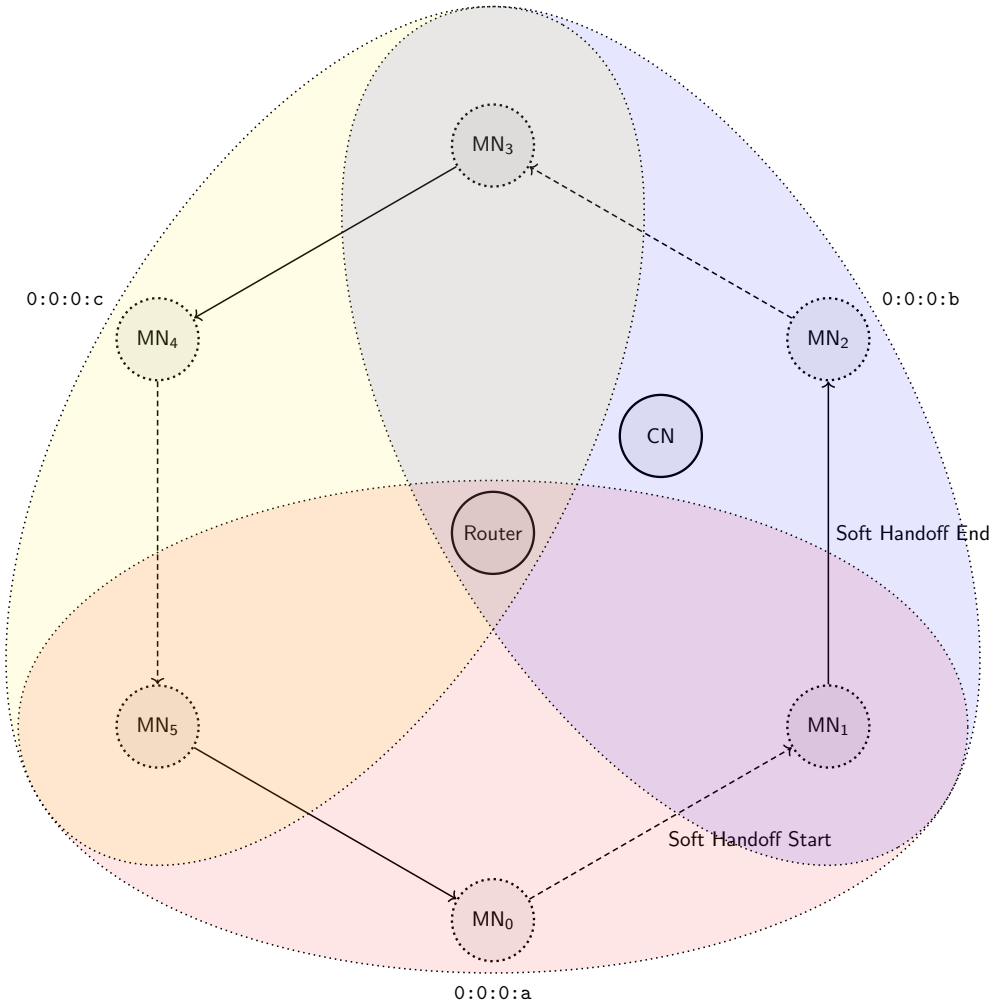
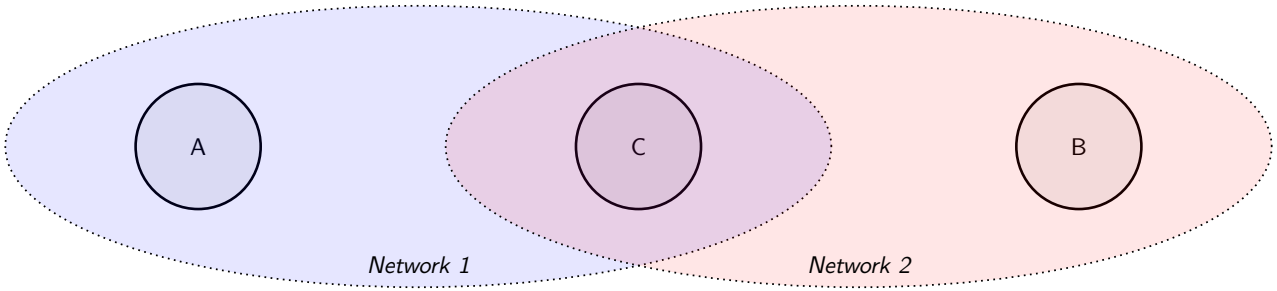
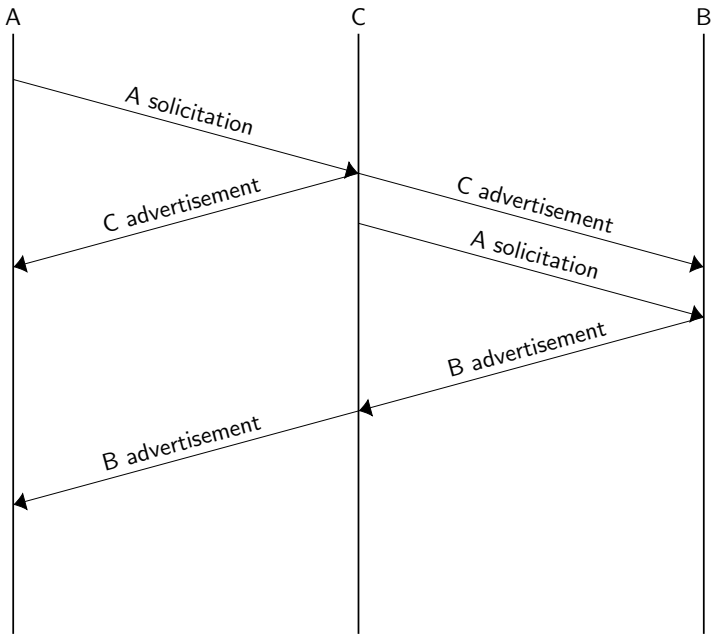


Figure: Physical Testbed

Discovery Protocol Example



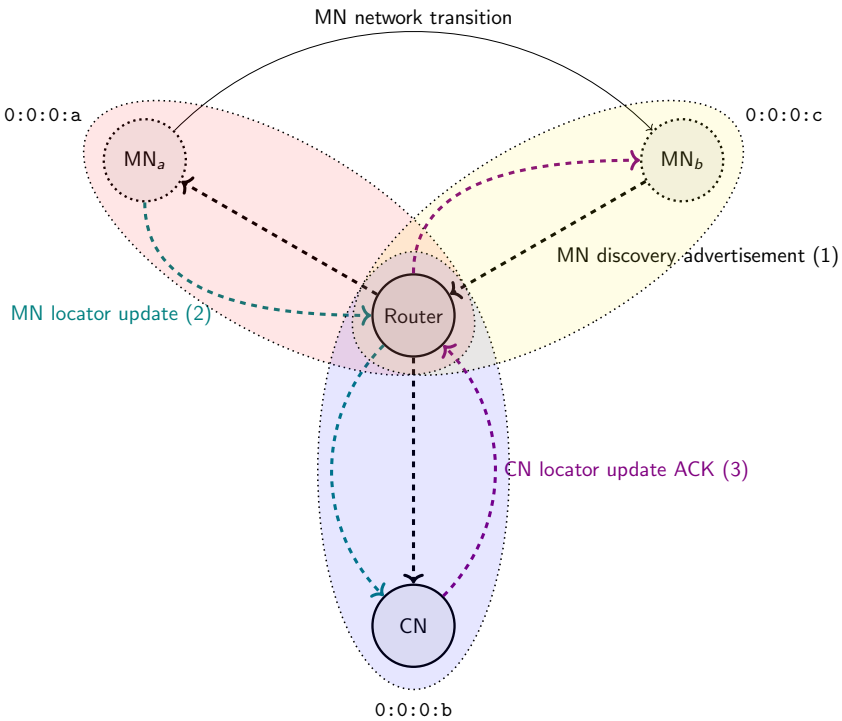
(a) Network Topology



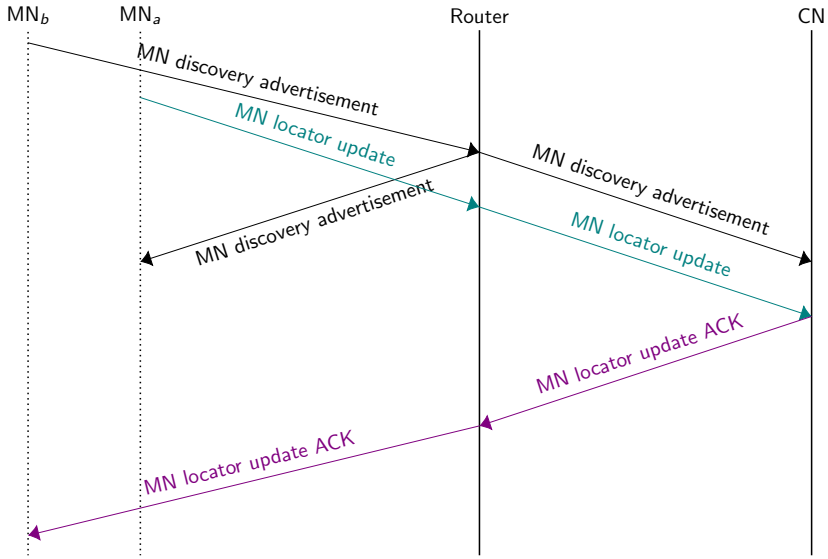
(b) Sequence Diagram

Figure: Discovery Protocol Example

Locator Update Example



(a) Network Topology



(b) Sequence Diagram

Figure: Locator Update Example

Physical Testbed

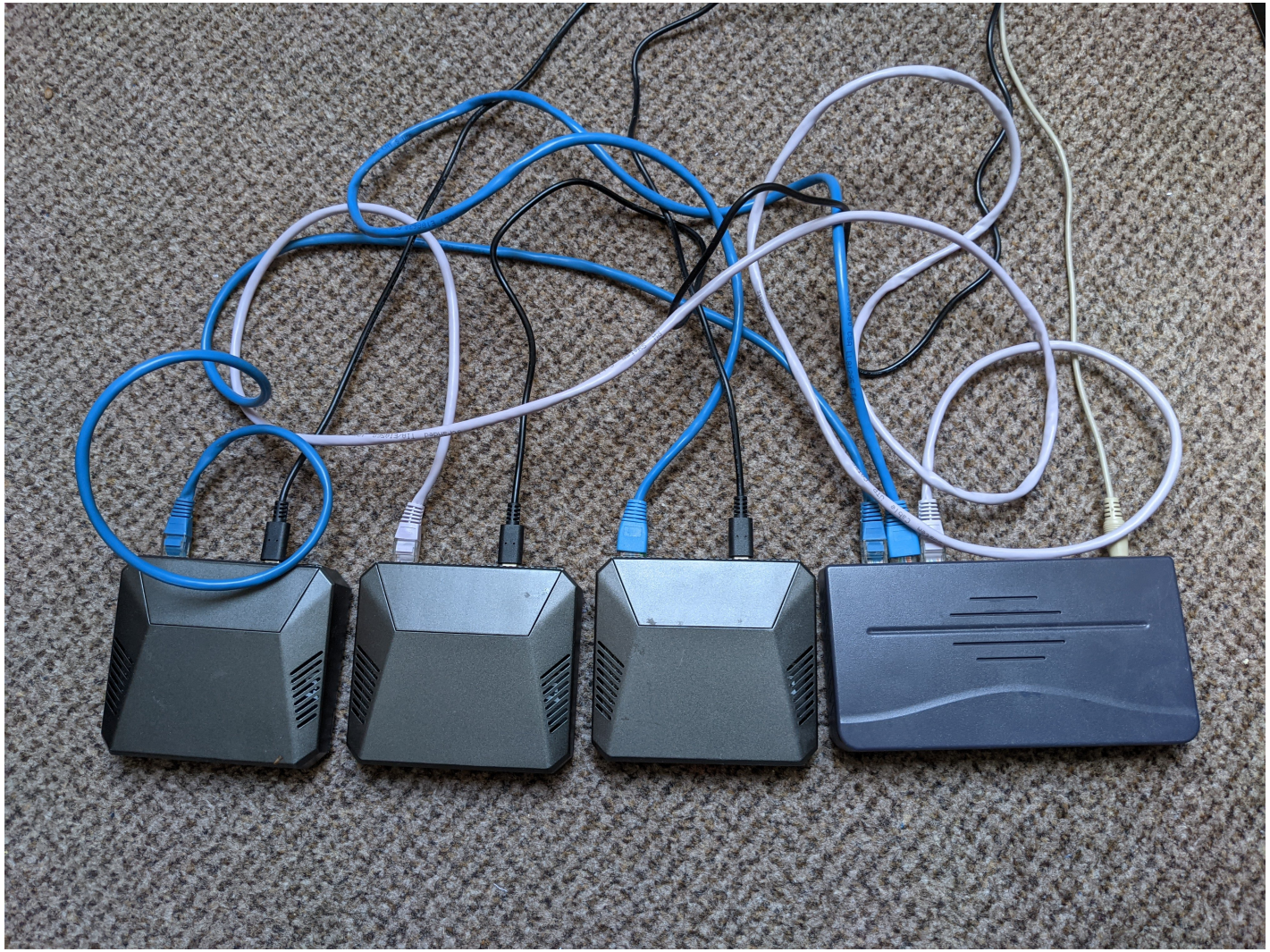


Figure: Physical Testbed

Experiment Virtual Topology

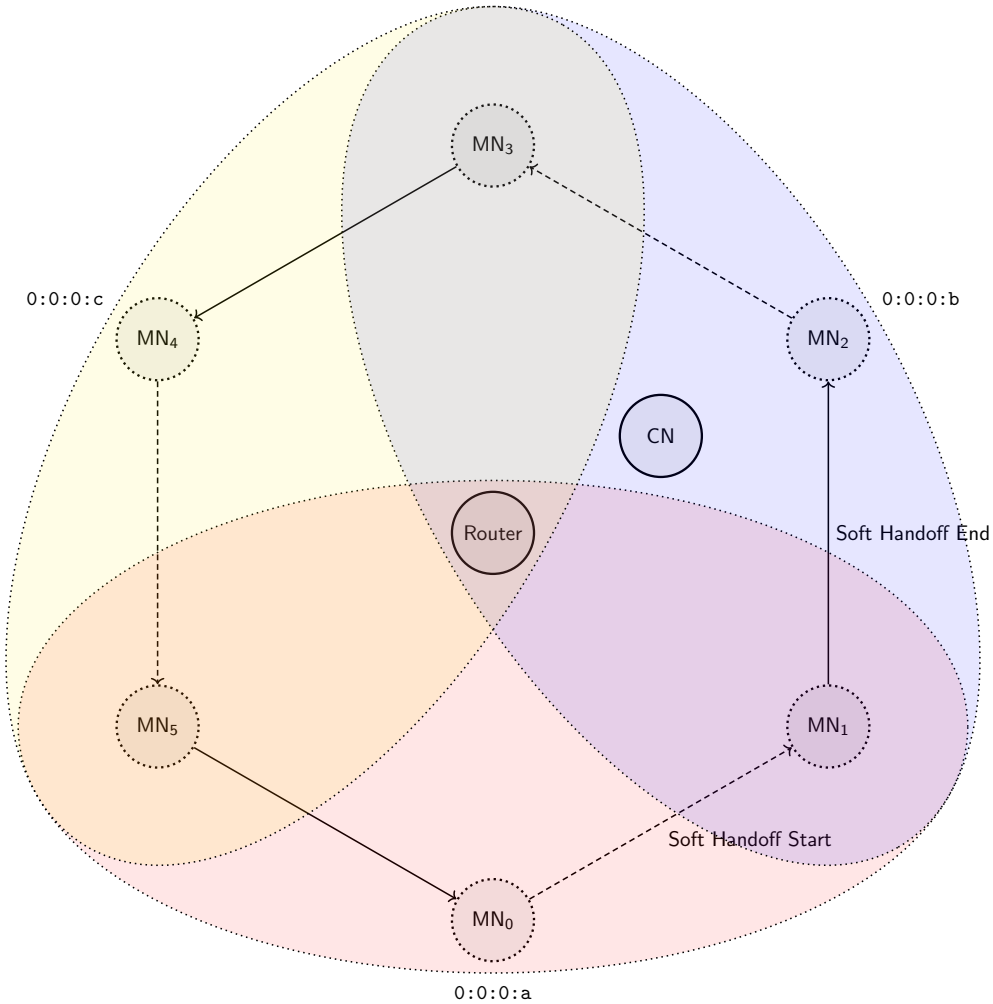
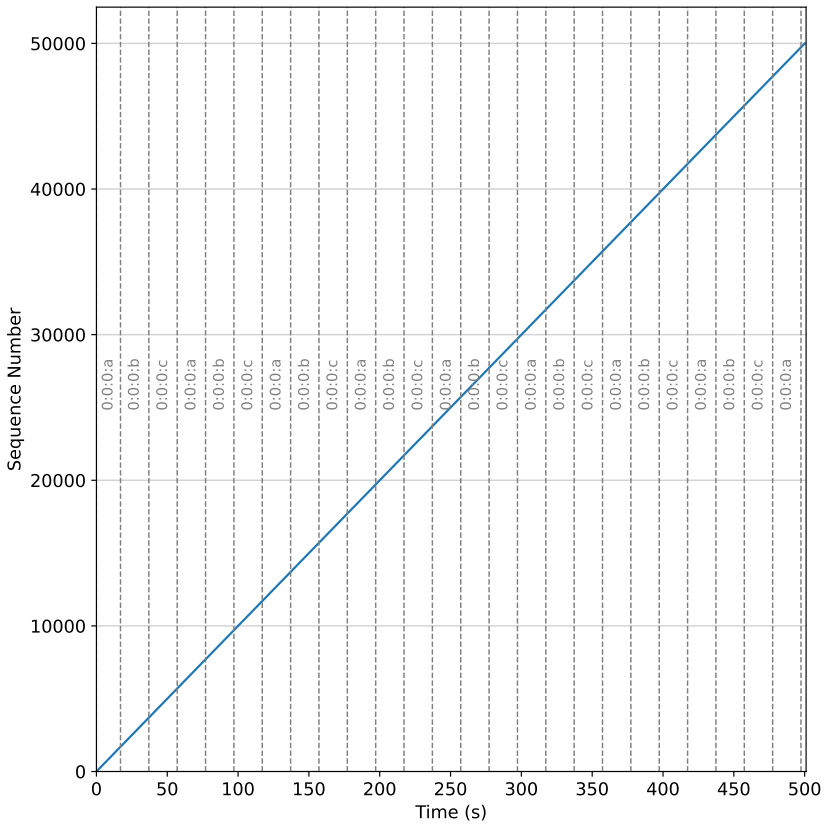


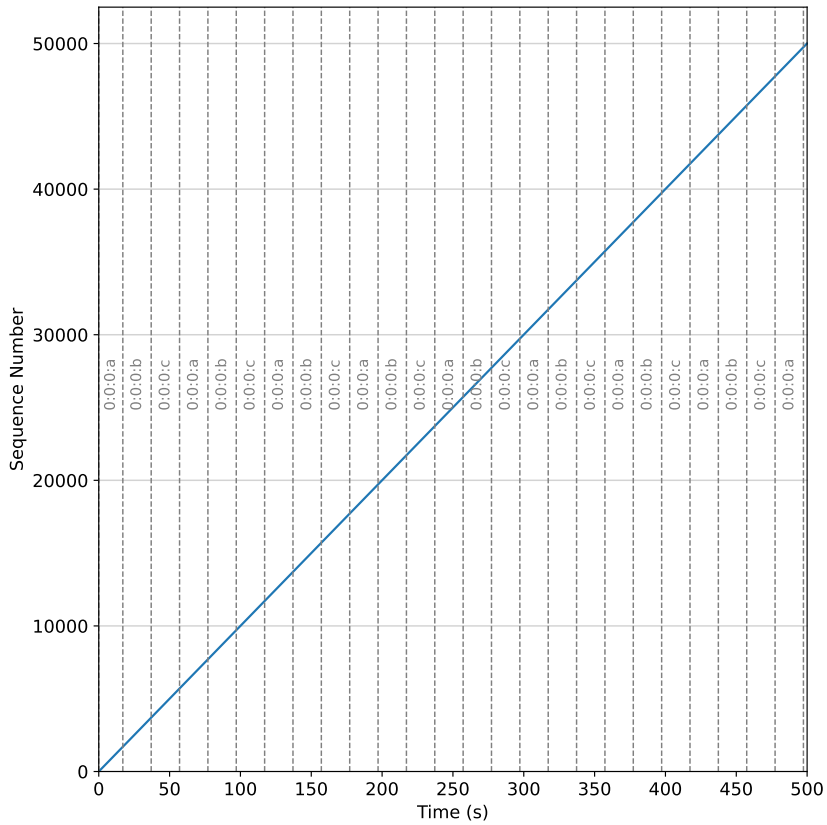
Figure: Experiment Virtual Topology

Heartbeat Demo

Experiment Results



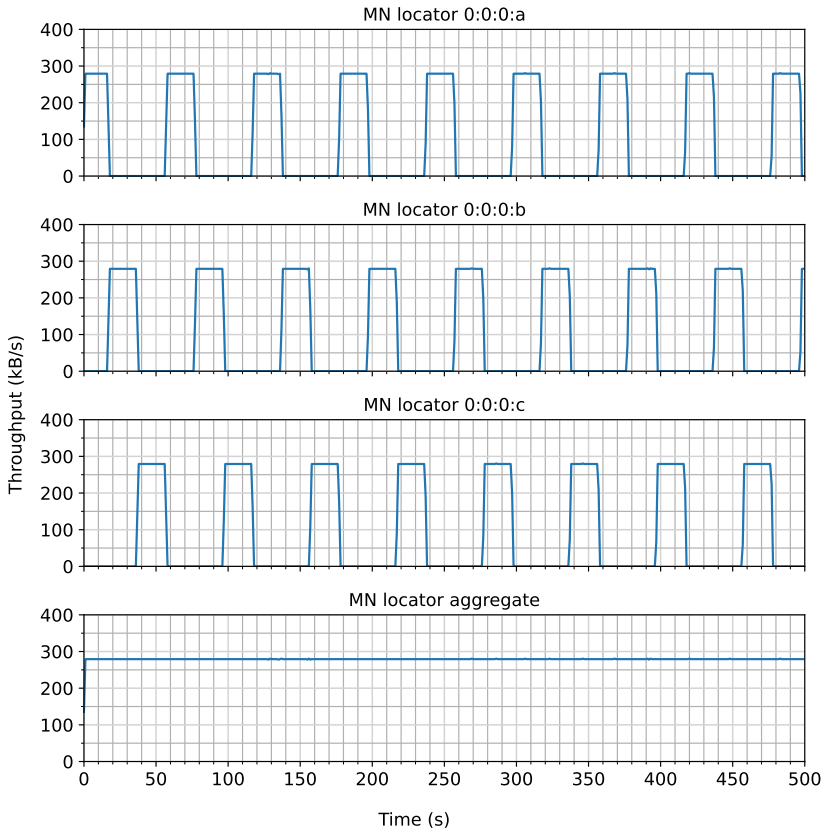
(a) Received sequence numbers vs Time on MN



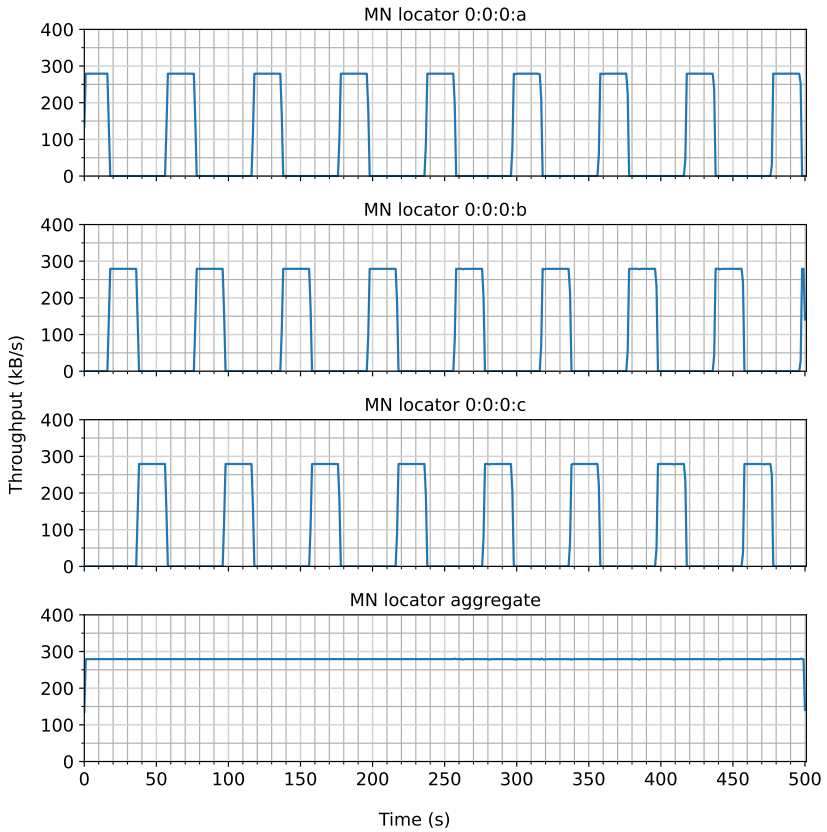
(b) Received sequence numbers vs Time on CN

Figure: Experiment 3 MN<->CN: Received sequence numbers vs Time

Experiment Results



(a) Throughput in 1s buckets vs Time on CN

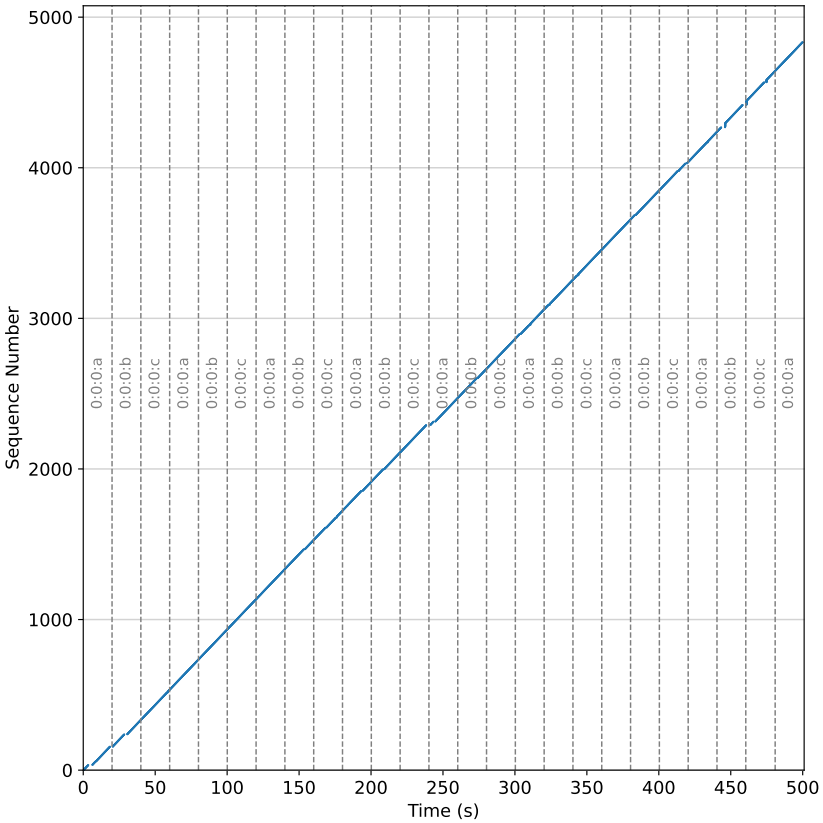


(b) Throughput in 1s buckets vs Time on MN

Figure: Experiment 3 MN<->CN: Throughput in 1s buckets vs Time

Questions?

Bonus: System Stability Issues



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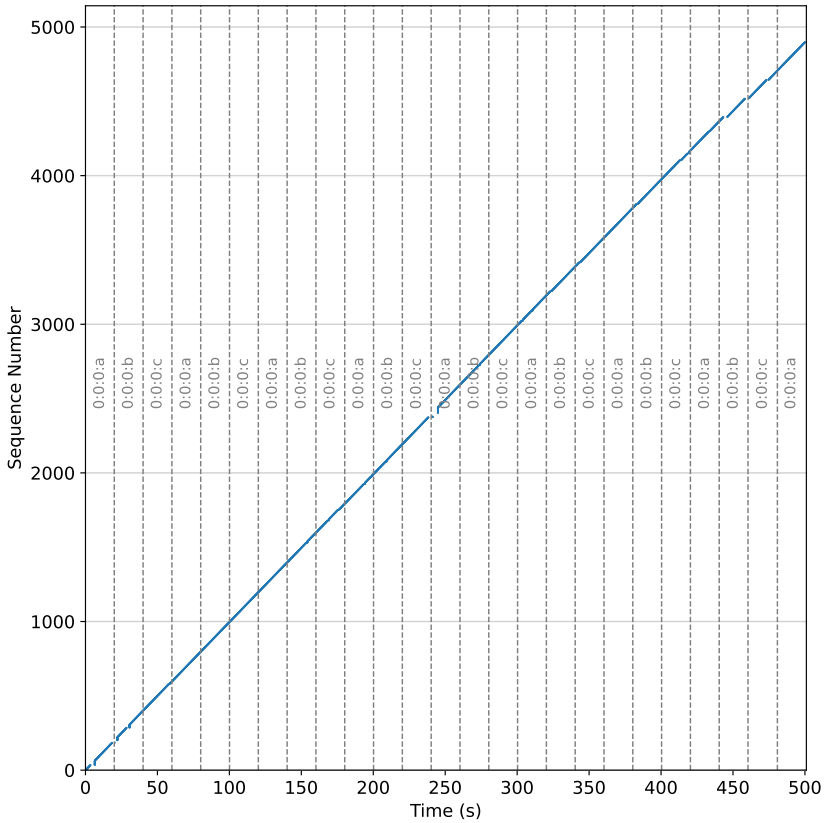
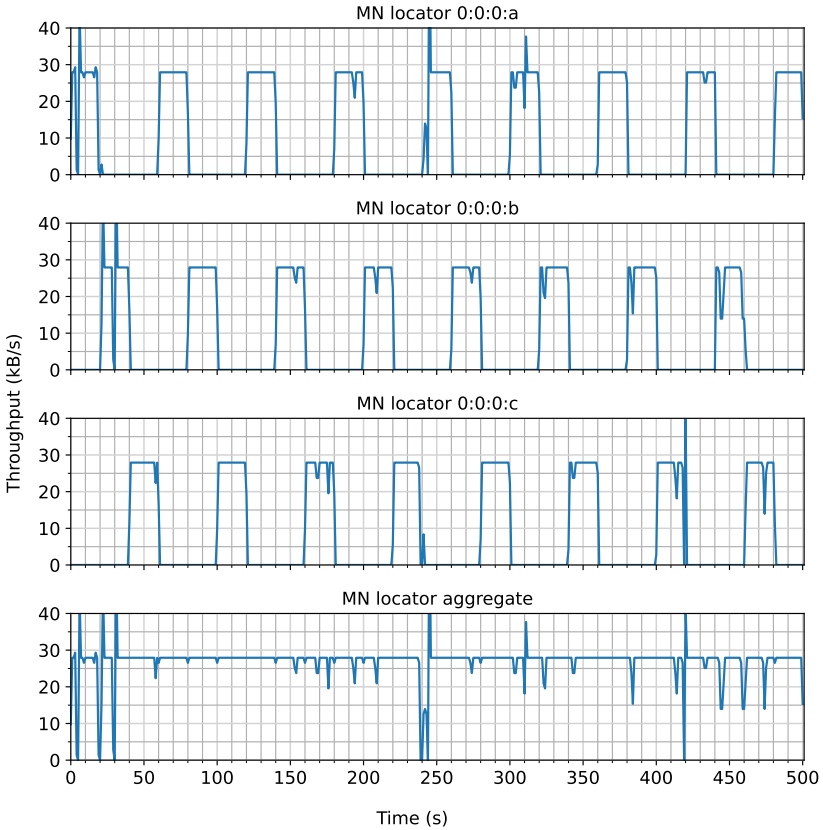


(b) Received sequence numbers vs Time on CN

Figure: System Issues Experiment 3 CN<->MN Received sequence numbers vs Time

Bonus: System Stability Issues



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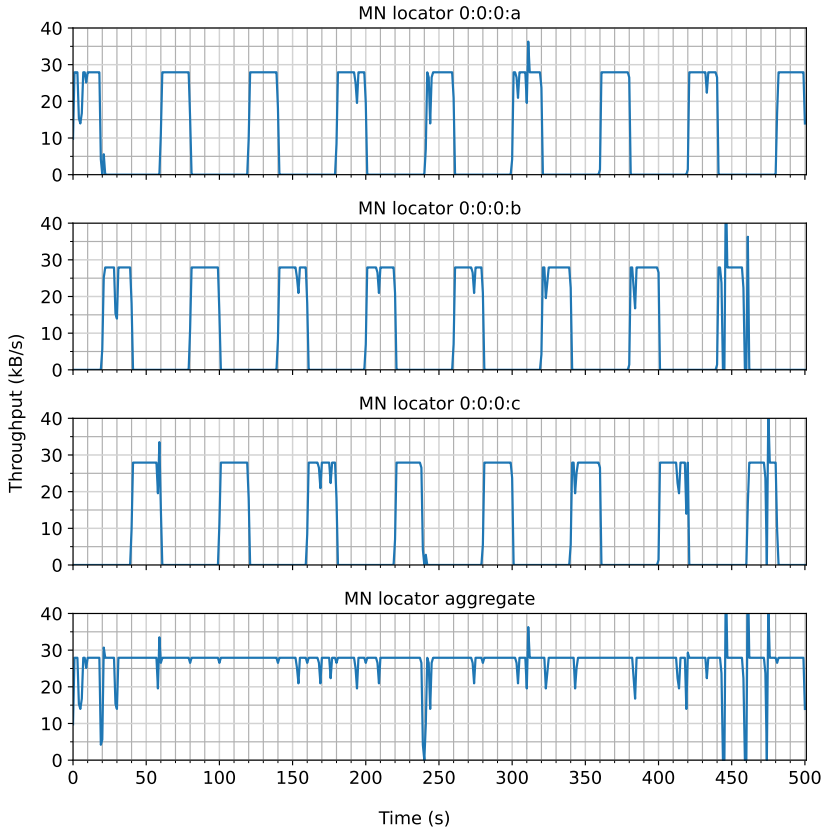

(b) Throughput in 1s buckets vs Time on MN

Figure: System Issues Experiment 3 CN<->MN Throughputs in 1s buckets vs Time