

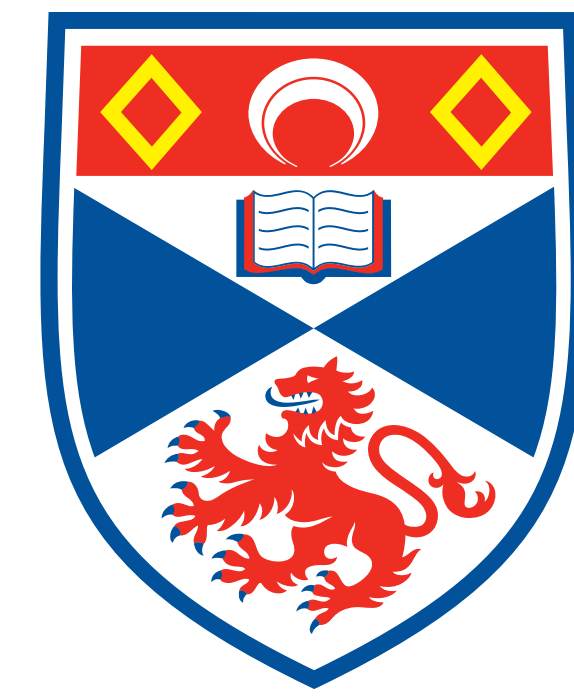
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# CS4099 DEMO

## Ubiquitous Communication for the Internet of Things

### An Identifier-Locator addressing split overlay network

School of Computer Science  
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## Background

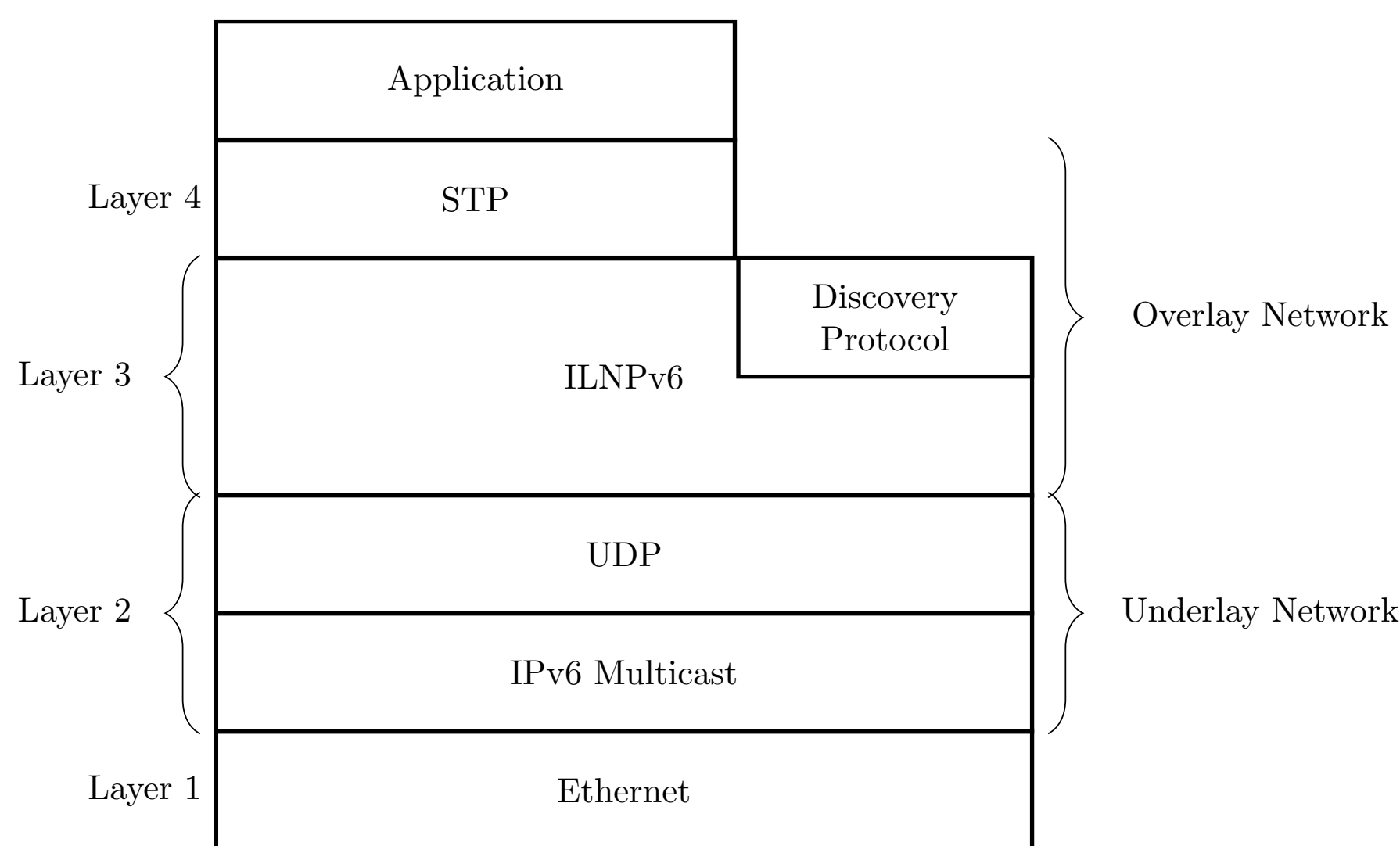
- Ubiquitous Computing and the Internet of Things.
- Mobility in IP.
  - Overloading of IP address semantics.
  - Entanglement of layers.
- Identifier-Locator Network Protocol (ILNP).

Protocol layer	ILNP	IP
Application	FQDN	FQDN, IP address
Transport	Identifier, $I$	IP address
Network	Locator, $L$	IP address
(interface)	dynamic binding	IP address

ILNP and IP use of names

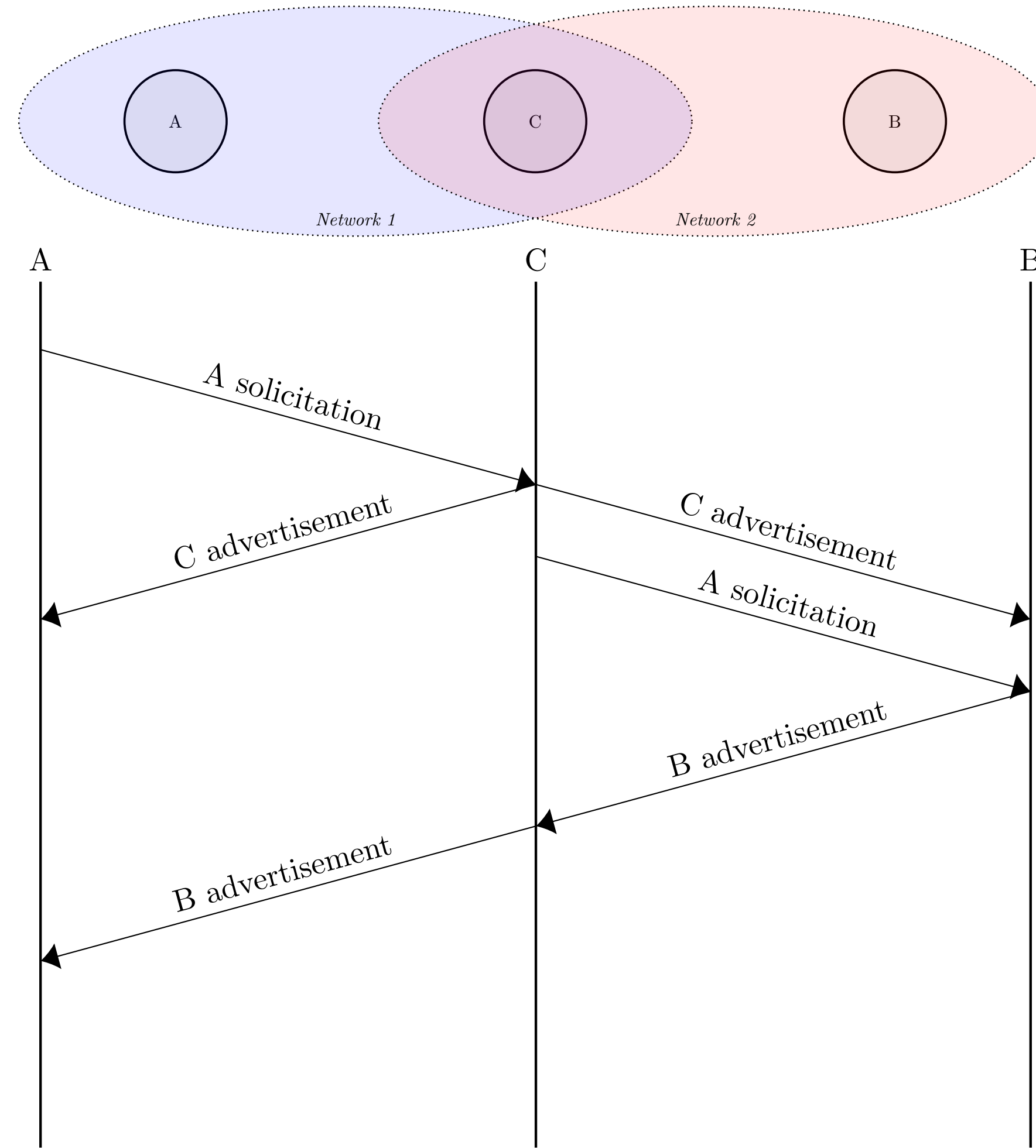
## An ILNP Overlay Network

- Created in userspace with Python.
- Focus on protocol design and interaction.
- Evaluated with experimental analysis in IoT scenario (Raspberry Pis).



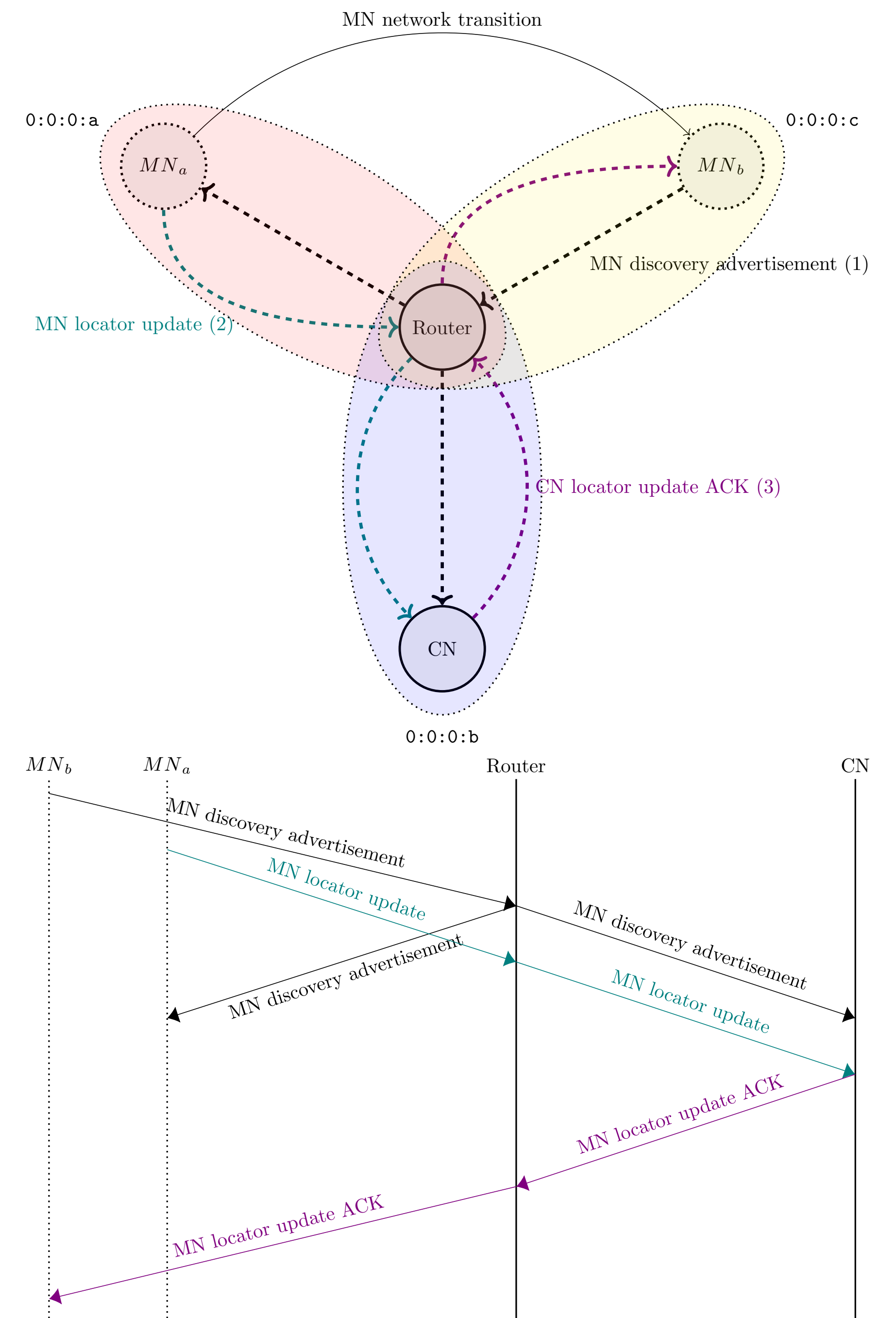
## Discovery Protocol Example

- Similar to IPv6 Neighbour Discovery.
- Includes hostname resolution.
- Packets used for backwards learning.
- Bootstarts network by populating forwarding table.

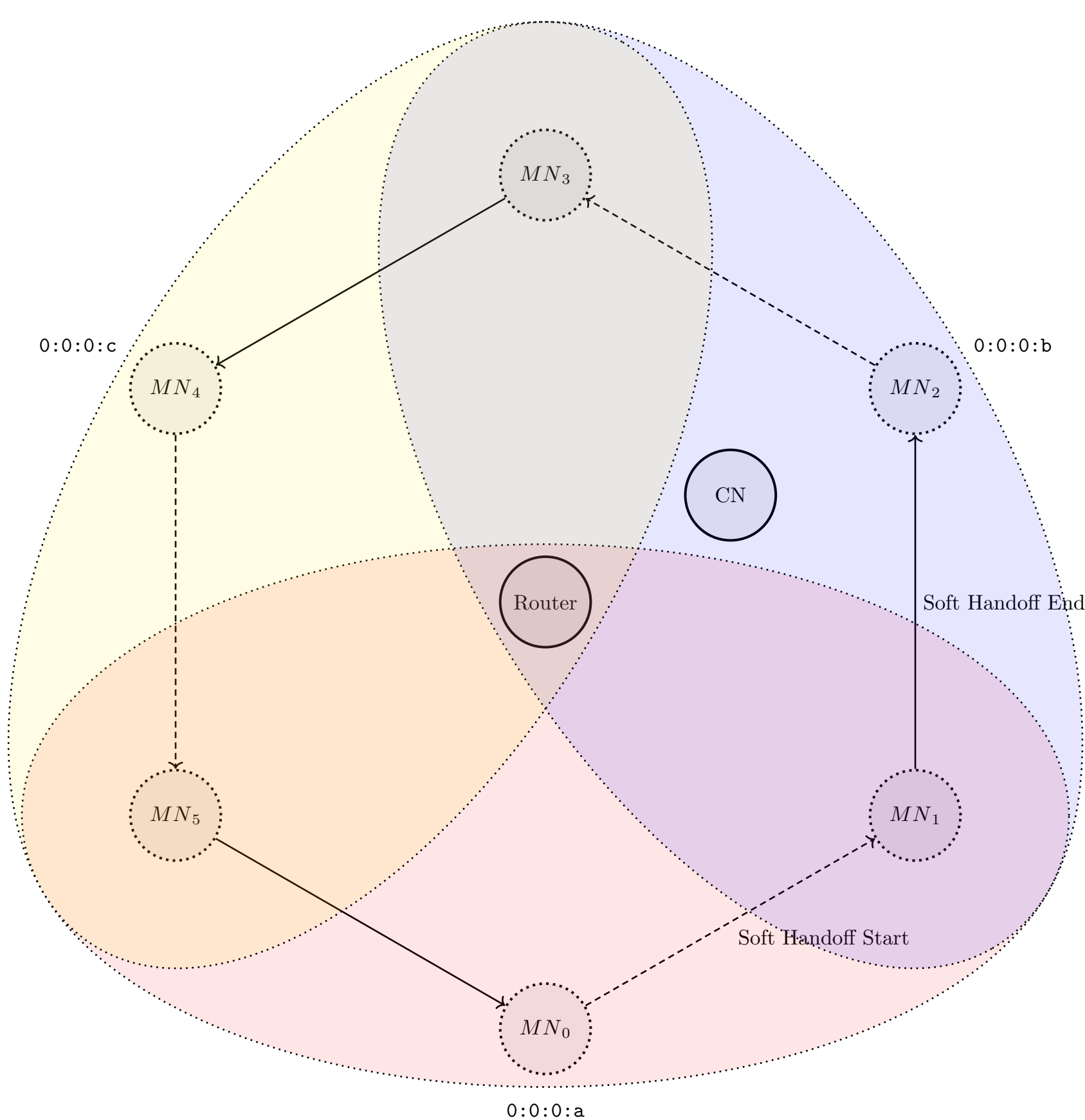


## Locator Update Protocol Example

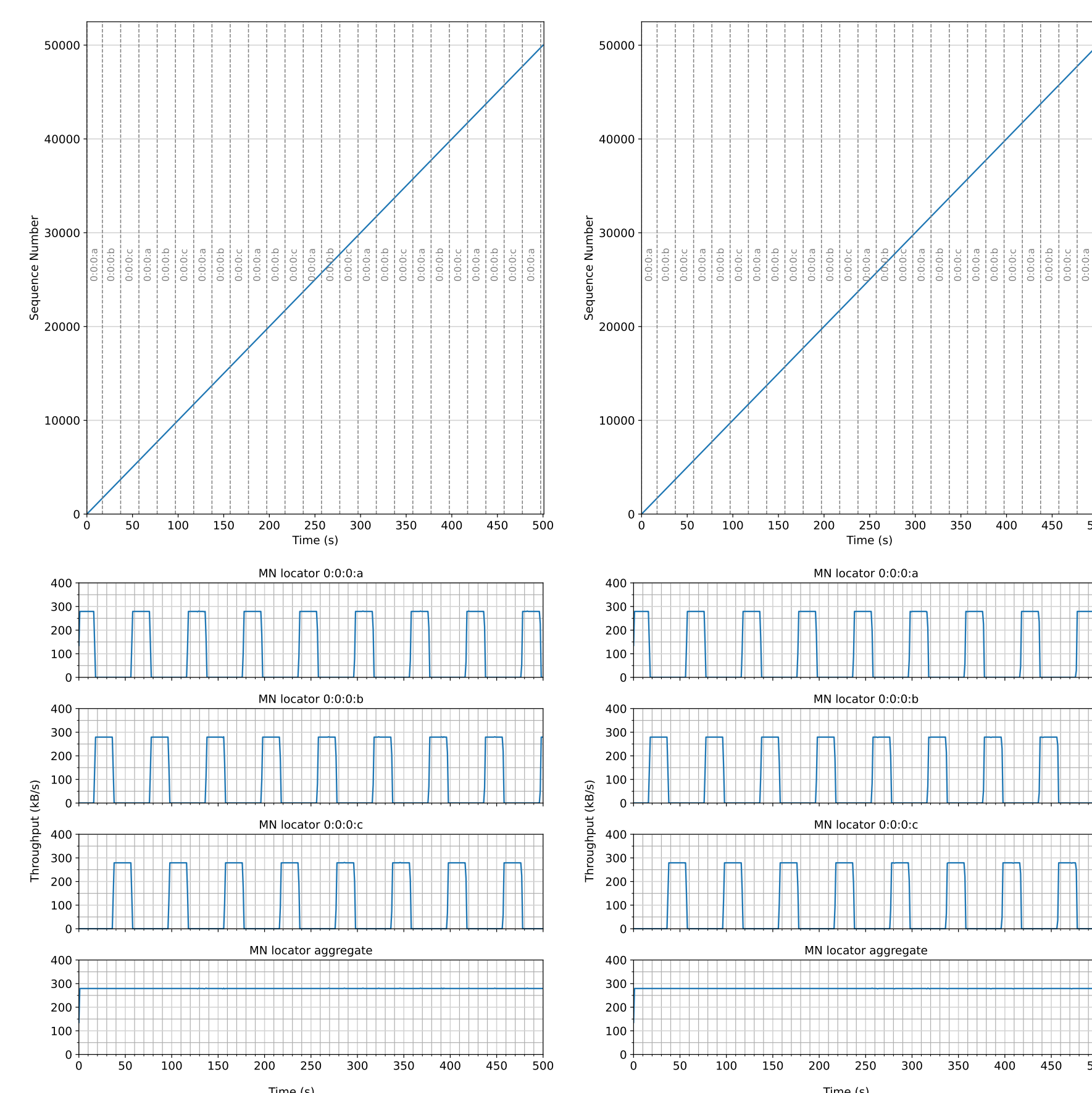
- ILNP supports seamless connectivity through soft handoffs for layer 3 network transitions.
- MN discovery advertisement is for CN to learn where to forward packets to the new locator ( $0:0:0:c$ ).
- Locator update informs all hosts in a unicast communication session with MN of new locator.



## Experiment Setup

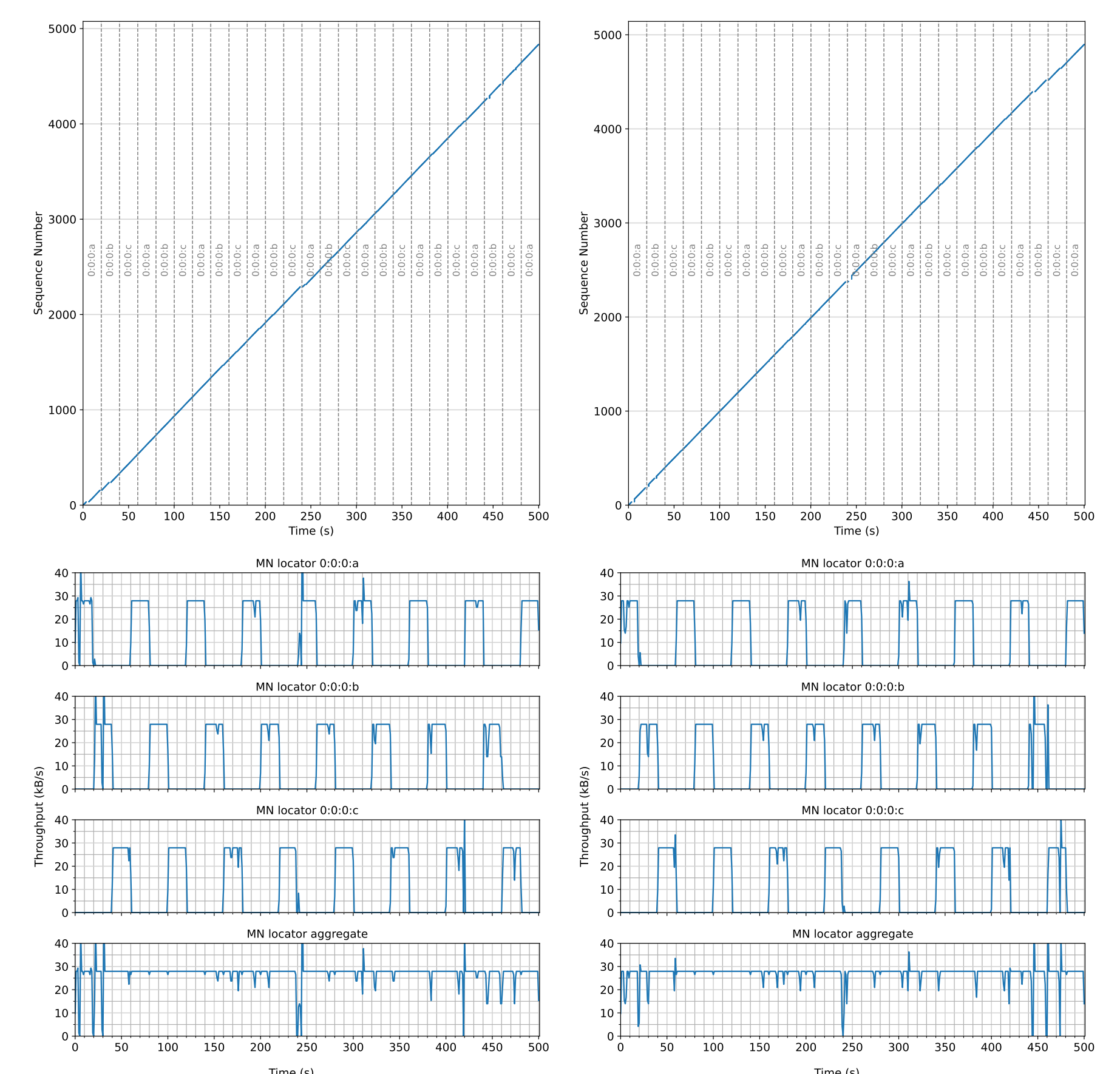


## Experiment 3 MN<->CN



- Bidirectional flow of 1388 byte packets between CN and MN every 10ms.
- Smooth receipt of sequence numbers across network transitions.
- Rectangular throughputs for each locator shows distinct separation between locator uses.
- Aggregate throughput shows smooth connectivity across network moves.

## Systems Stability Issues



- This is exactly what we *don't* want to see: gaps in sequence numbers, and drops & spikes in throughput.
- This was caused by disk I/O resulting in processes being suspended, due to poor write performance when flushing page cache.