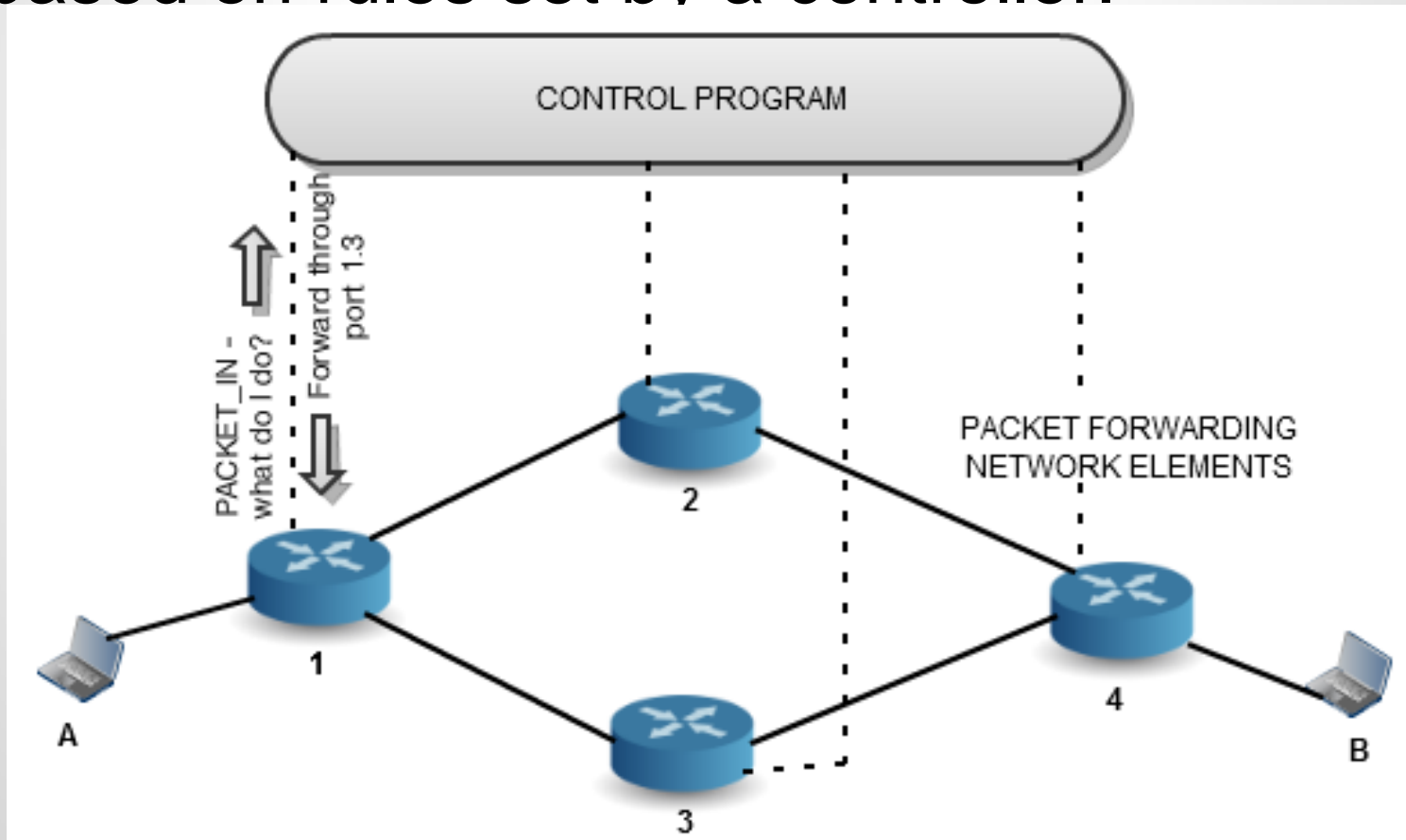# OpenFlow Implementation of Mobility First

WINLAB Summer Internship
Aravind Krishnamoorthy

OpenFlow Architecture

- Dumb network elements forwarding packets based on rules set by a controller.

Floodlight and Click

- FLOODLIGHT - Java based OpenFlow controller from Big Switch.
- CLICK - Software router upon which custom routing modules can be built.

- Getting familiar with Floodlight API and building simple modules.
- Running test experiments on ORBIT with the Click implementation of Mobility First.

OpenFlow Packet Handling

```
▼ OpenFlow Protocol
  ▼ Header
      Version: 0x01
      Type: Packet In (AM) (10)
      Length: 88
      Transaction ID: 0
  ▼ Packet In
      Buffer ID: 288
      Frame Total Length: 70
      Frame Recv Port: 1
      Reason Sent: No matching flow (0)
    ▼ Frame Data: 33330000000200000000000386dd6000000000103afffe80...
      ▶ Ethernet II, Src: 00:00:00_00:00:03 (00:00:00:00:00:03), Dst: IPv6mcast_00:00:00:02 (33:33:00:00:00:02)
      ▼ Internet Protocol Version 6, Src: fe80::200:ff:fe00:3 (fe80::200:ff:fe00:3), Dst: ff02::2 (ff02::2)
        ▶ 0110 .... = Version: 6
        ▼ .... 0000 0000 .... .... .... .... .... = Traffic class: 0x00000000
            .... 0000 00.. .... .... .... .... .... = Differentiated Services Field: Default (0x00000000)
            .... .... ..0. .... .... .... .... .... = ECN-Capable Transport (ECT): Not set
            .... .... ...0 .... .... .... .... .... = ECN-CE: Not set
          .... .... .... 0000 0000 0000 0000 0000 = Flowlabel: 0x00000000
          Payload length: 16
          Next header: ICMPv6 (0x3a)
          Hop limit: 255
          Source: fe80::200:ff:fe00:3 (fe80::200:ff:fe00:3)
          [Source SA MAC: 00:00:00_00:00:03 (00:00:00:00:00:03)]
```
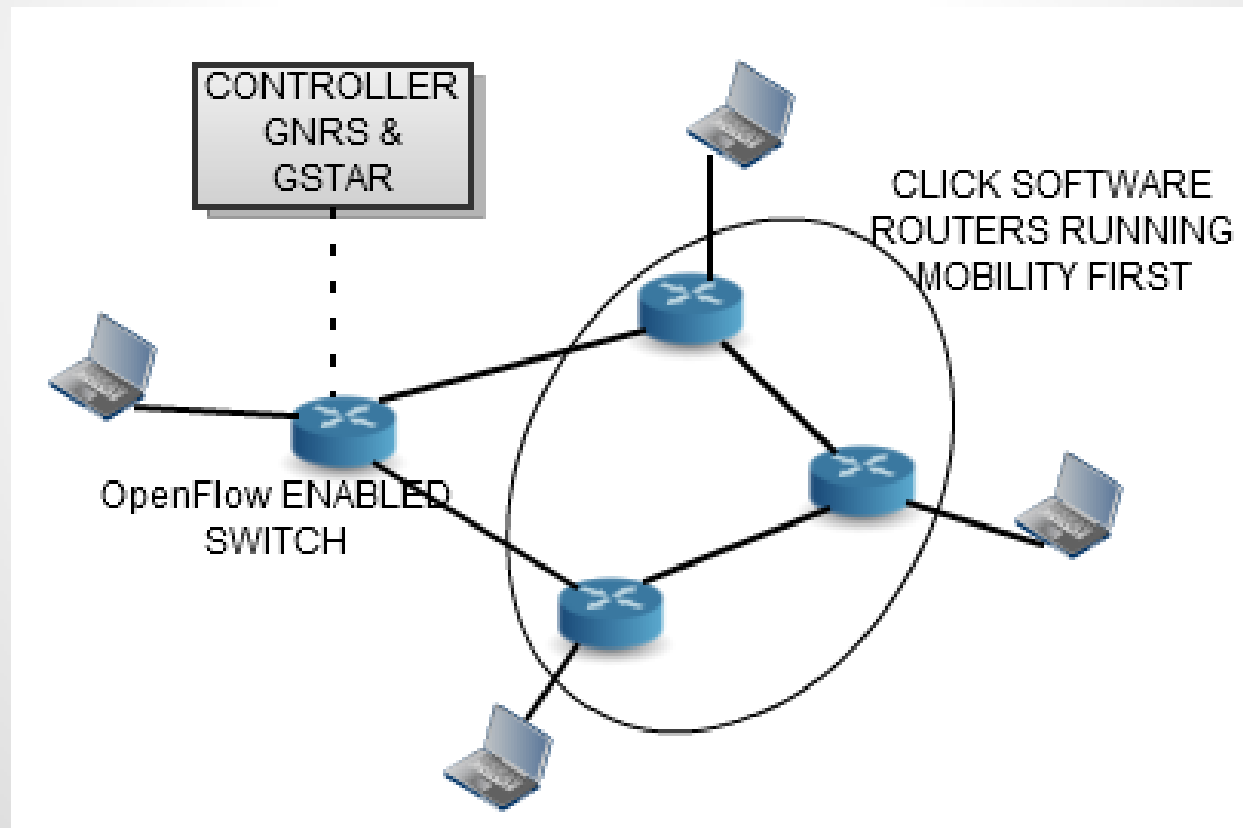
Proposed Test Framework

- One OpenFlow router operating in tandem with click software routers

The Following Week......

- Running Floodlight modules on ORBIT.
- GUID based forwarding using OpenFlow.
  - Static mappings between GUID & NA.
  - Resolve NA to a switch port and install the flow on the switch.
- Mapping Mobility First header to IPv4 header.
  - Field X of the IPv4 header corresponds to field Y of the Mobility First header.

THANK YOU