PRAGMA 39

Edge IoT, SDN based on SRv6

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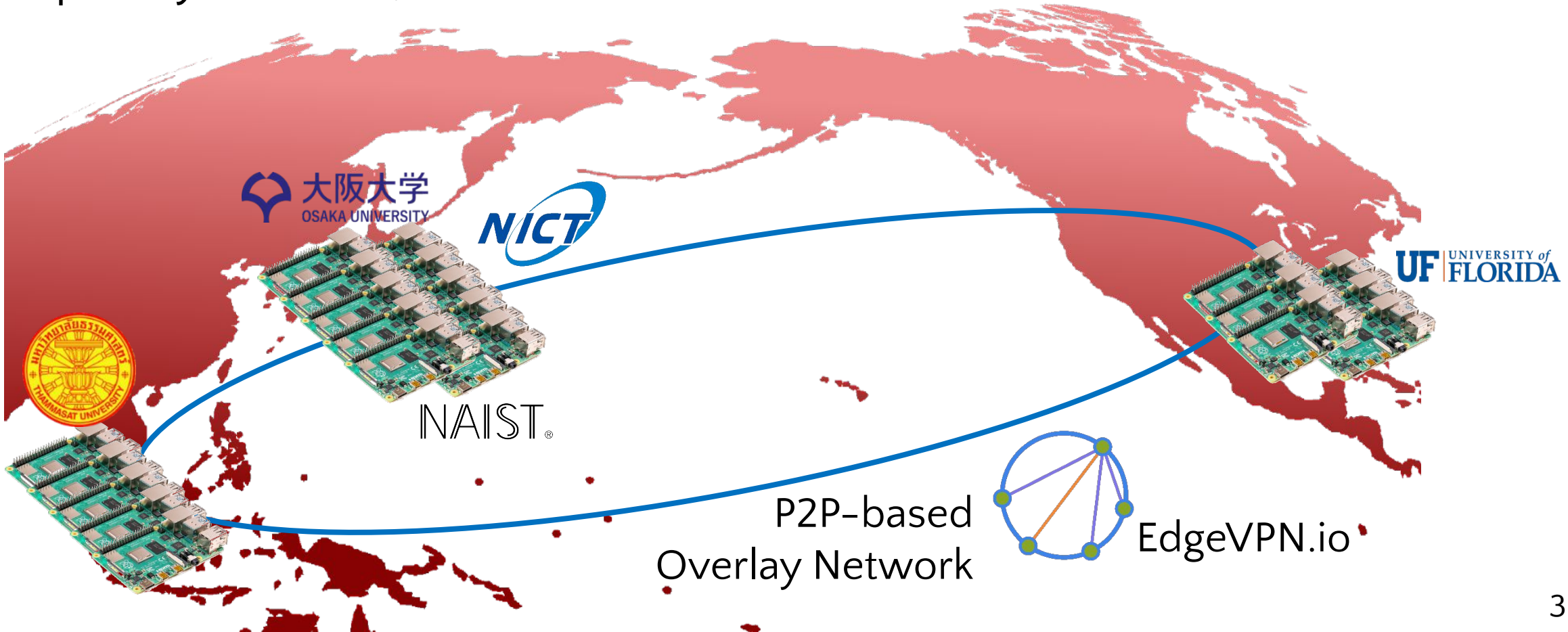
Edge IoT

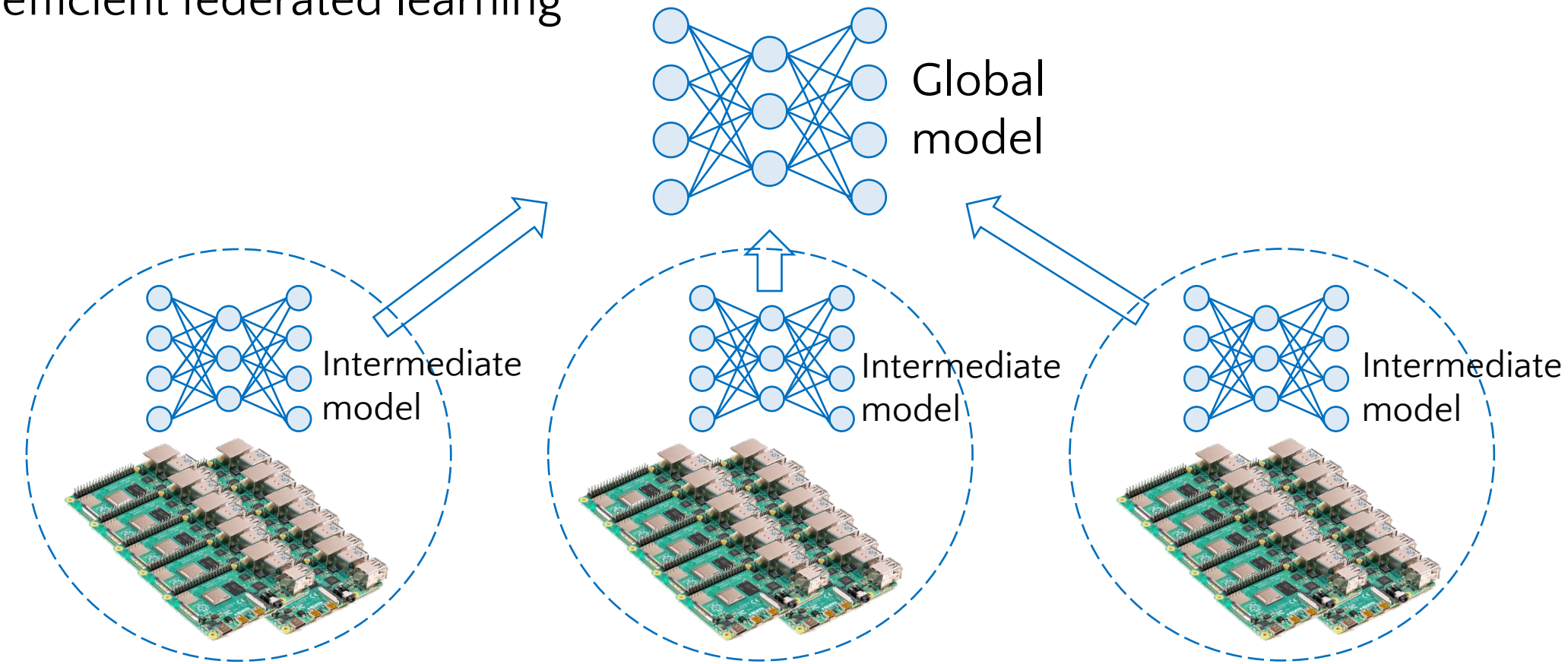
Edge IoT Testbed / PiK8kE (UF/NAIST/OU/TU)

An evolving international testbed for federated edge computing on Raspberry Pi 4 and Jetson Nano devices



Application on Edge IoT

- Widely Distributed Federated Learning
  - forms a hierarchal structure based on the geographical distribution for efficient federated learning

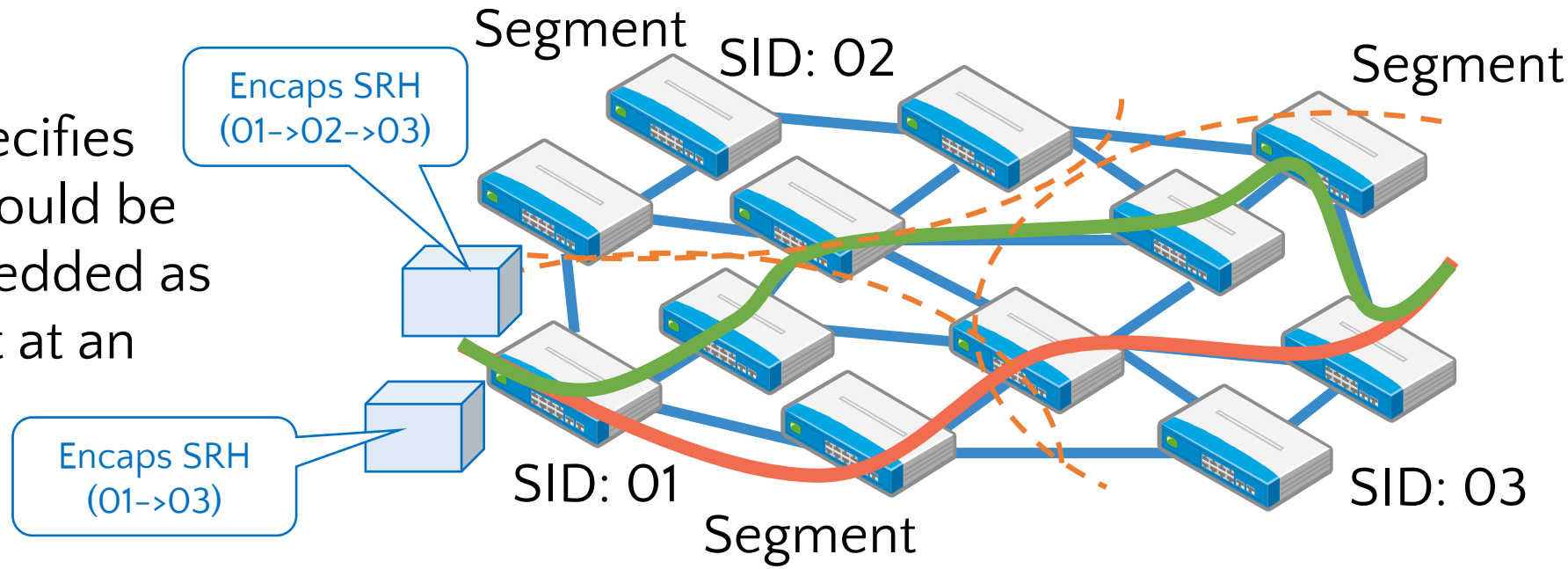


SDN based on SRv6

SRv6 (Segment Routing over IPv6)

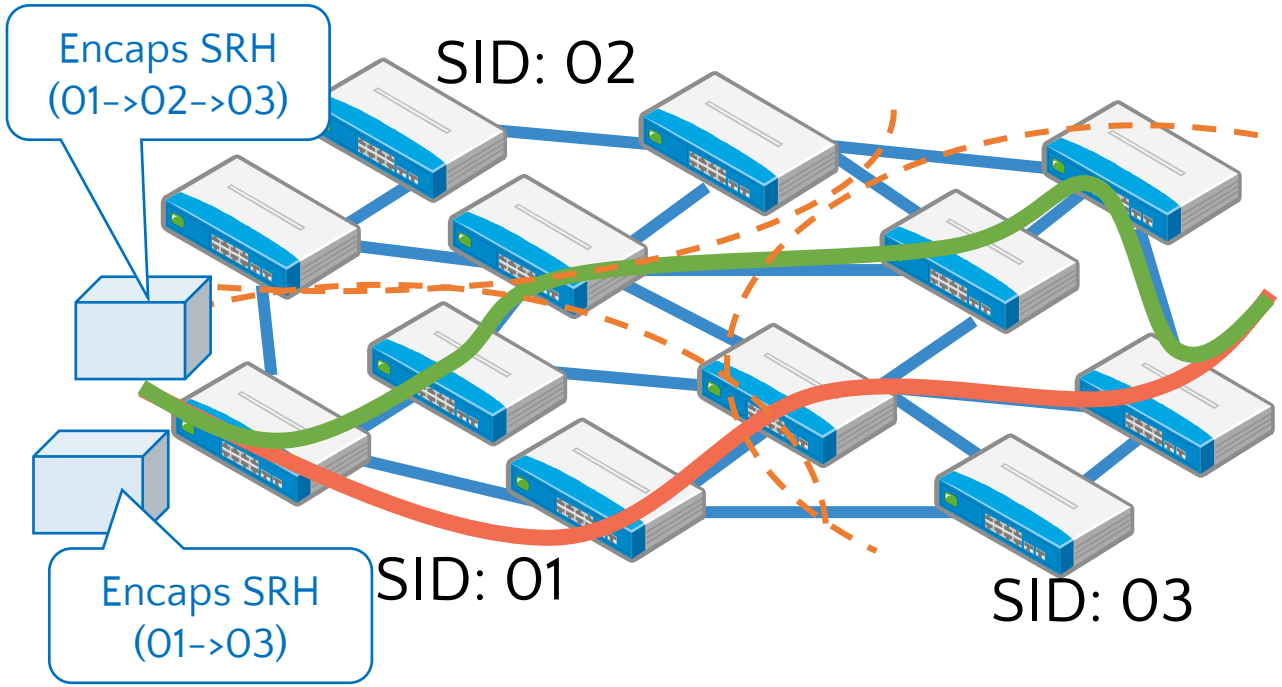
- Segment routing splits a network into multiple segments, and assigns a unique ID, SID, for each segment
- Routes are configured at each ingress node (source node)
- Topologies and routes are calculated by existing routing protocols (e.g. OSPF, BGP)

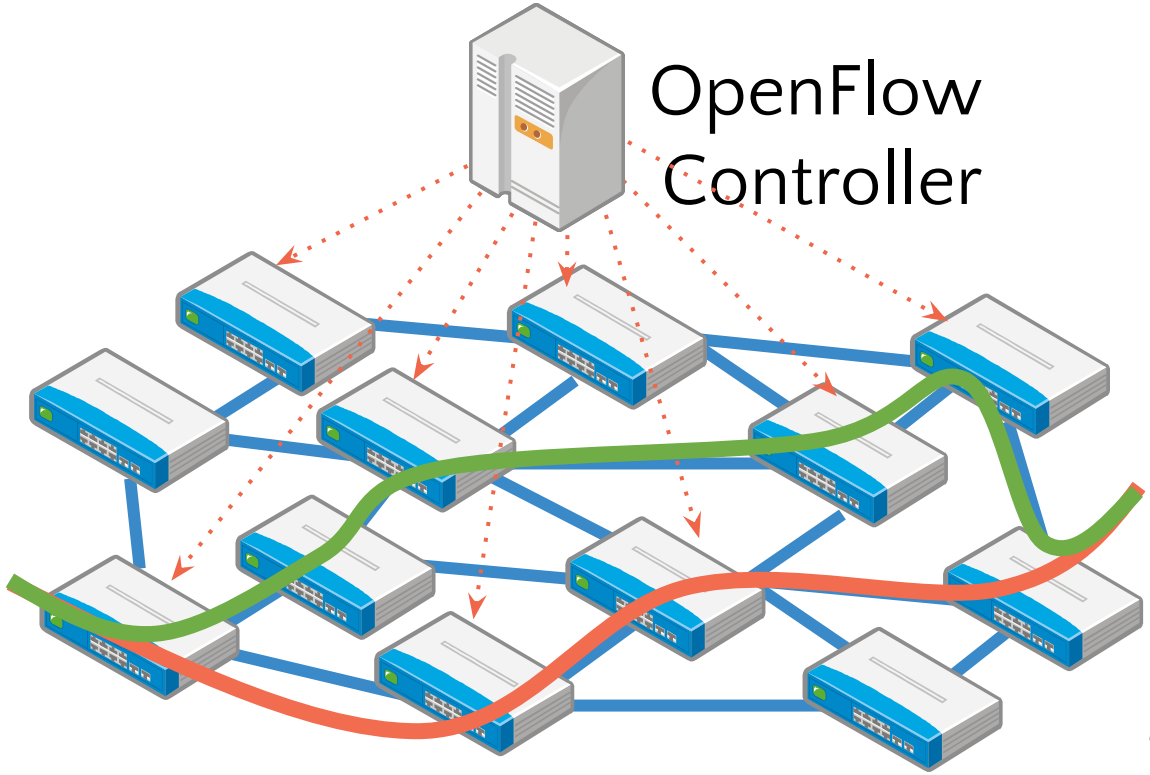
A list of SIDs, that specifies a route the packet should be pass through, is embedded as SRH into each packet at an ingress node



SRv6 vs OpenFlow

- OpenFlow is a centralized approach, not scalable, needs to implement network functions from scratch, uses much resources to maintain flow tables
- SRv6 is a distributed approach. Routing is controlled at each source.
  It can be just added on the existing networks.





SRv6 Testbed in Japan

- We are deploying software routers that supports SRv6, called Kammuee, DPDK-based high performance router developed by NTT Comm. (In progress)
- The challenge is how to handle inter-domain SRv6 networks