Homework 5 Mininet documentation

This project implements a Layer-3 network in Mininet with three routers and three LANs. The Python code defines routers, hosts, switches, and configures IPs and routes.

Project Code

Mininet Layer-3 Topology Script: Routed Three LANs

This script defines and runs a Mininet topology consisting of: - Three routers (rA, rB, rC) with IP forwarding enabled - Three LANs (A, B, C), each connected to one router via a switch - Inter-router point-to-point links forming a triangular topology - Hosts with static IPs connected to their respective LAN switches - Static routes on routers and default routes on hosts

`class layer3_network_code.RoutedThreeLanTopo(*args, **params)`

Bases: `Topo`

Layer-3 Topology with Three LANs and Three Routers.

Topology Layout:

LAN A (hA1, hA2) — s1 — rA LAN B (hB1, hB2) — s2 — rB LAN C (hC1, hC2) — s3 — rC

Inter-router Links:

rA — rB rB — rC rC — rA

Methods

build()

Build the Mininet topology by adding routers, switches, hosts, and links.

`build()`

Build the Mininet topology.

Adds routers, switches, hosts, and point-to-point links between routers and LANs. Assigns interface names for inter-router links.

Returns

None

`class layer3_network_code.Router(name, inNamespace=True, **params)`

Bases: `Node`

Custom Router Node for Mininet.

Enables IPv4 forwarding when the router is started. Disables IPv4 forwarding when the router is terminated.

Methods

config(**params)

Configure the router and enable IP forwarding.

terminate()

Disable IP forwarding before terminating the router.

config(***params*)

Configure the router.

This method calls the parent Node.config() and enables IPv4 forwarding on the router.

Parameters

–

**params : *dict*
Arbitrary keyword arguments passed to Node.config()

None

terminate()

Terminate the router.

This method disables IPv4 forwarding and calls the parent Node.terminate() method.

Returns

None

layer3_network_code.**run**()

Create and run the Mininet network with the RoutedThreeLanTopo.

Steps performed: 1. Start Mininet with the custom topology and no controller. 2. Configure router interfaces and bring them up. 3. Add static routes on routers. 4. Add default routes on hosts. 5. Launch the CLI for user interaction. 6. Stop the network on exit.

Returns

None