

Introductory and Advanced Topics on P4 Programmable Data Plane Switches

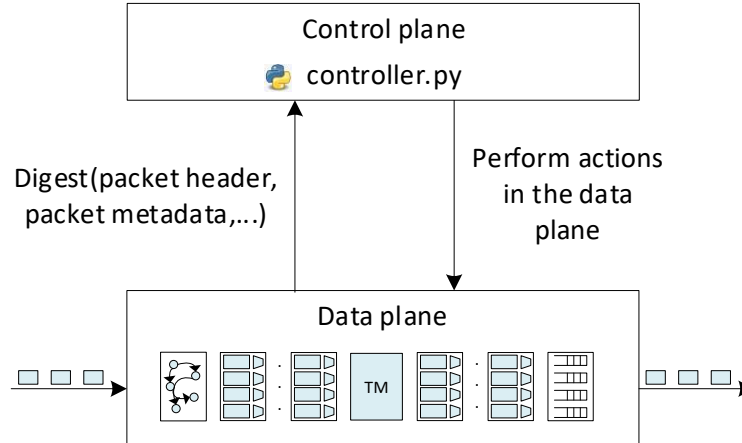
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Lab 11: Notifying the Control Plane from the Data Plane using Packet Digests

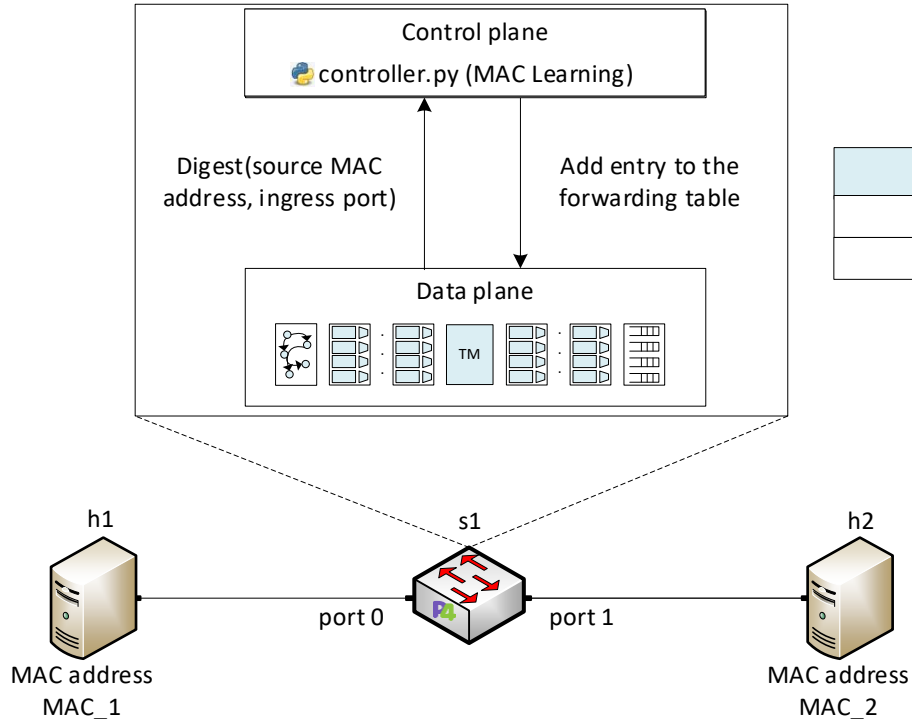
Packet Digests

- A digest is a mechanism to send messages from the data plane to the control plane.
- Digests contain data plane values such as packet headers and/or metadata to be processed by a program in the control plane (i.e., a controller).
- The controller computes digests and communicate with the data plane using runtime APIs.



Lab Scenario: MAC Learning

- Initially the forwarding table is empty.

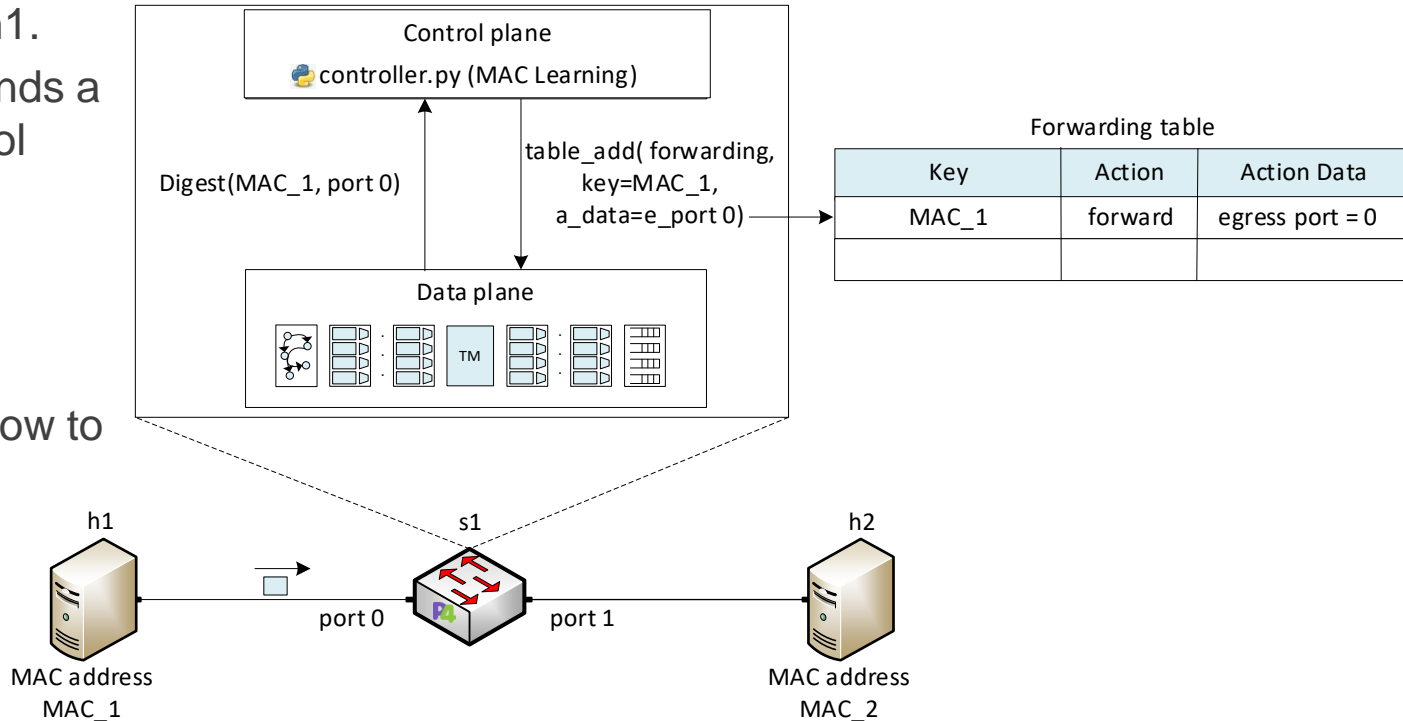


Forwarding table

Key	Action	Action Data

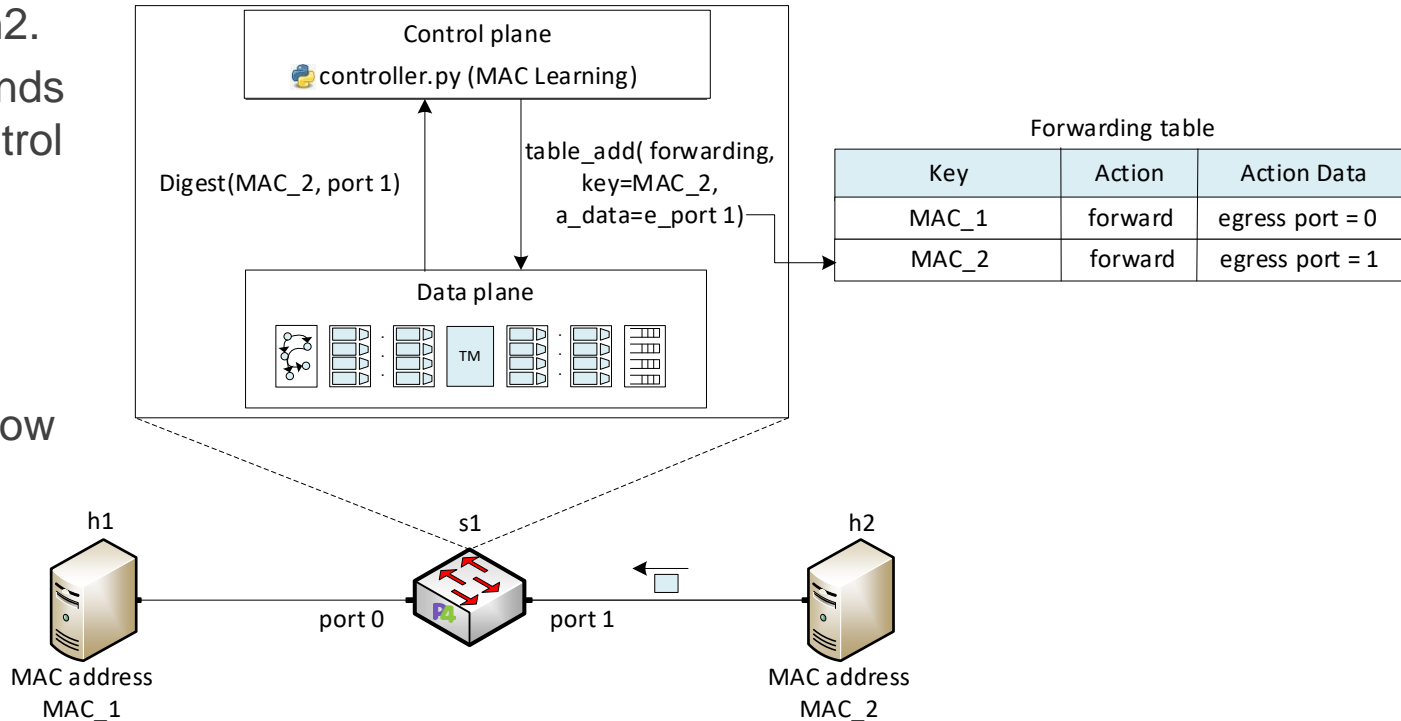
Lab Scenario: MAC Learning

- Switch s1 receives a packet from host h1.
- The data plane sends a digest to the control plane.
- The control plane populates the forwarding table.
- Switch s1 learns how to reach host h1.



Lab Scenario: MAC Learning

- Switch s1 receives a packet from host h2.
- The data plane sends a digest to the control plane.
- The control plane populates the forwarding table.
- Switch s1 learns how to reach host h2.
- Then, host h1 can reach host h2.



Lab Topology and Objectives

- The topology consists of two hosts: h1, h2, and one P4 switch: s1.
- Create a digest with the source MAC address and ingress port.
- Send the digest to the control plane.
- Program a controller with the runtime APIs to create table entries.
- Populate the forwarding table from the control plane.
- Verify the connectivity between end hosts.

