Lab 2: Calculating Packets Interarrival Times using Hashes and Registers

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Workshop on Accelerating Cybersecurity for High-Speed Networks:
Developing Defenses with P4 and DPDK
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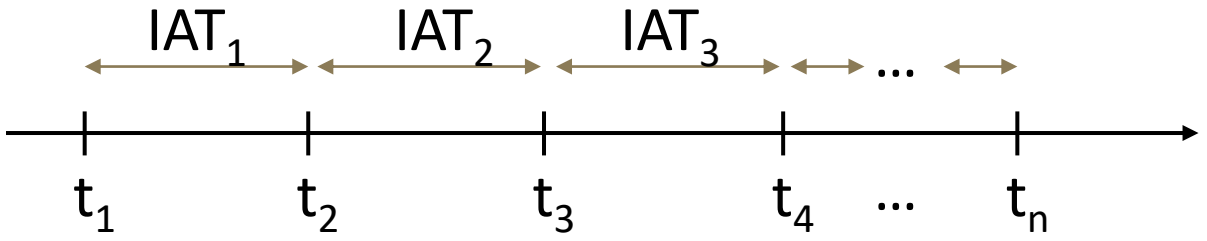
Calculating Packets Interarrival Times using Hashes and Registers

Lab activities are described in Lab 5, P4-DPDK Security lab series

Interarrival Times

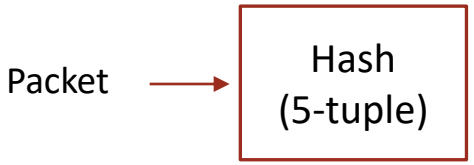
- The Interarrival time (IAT) is the time between two consecutive packets belonging to the same flow



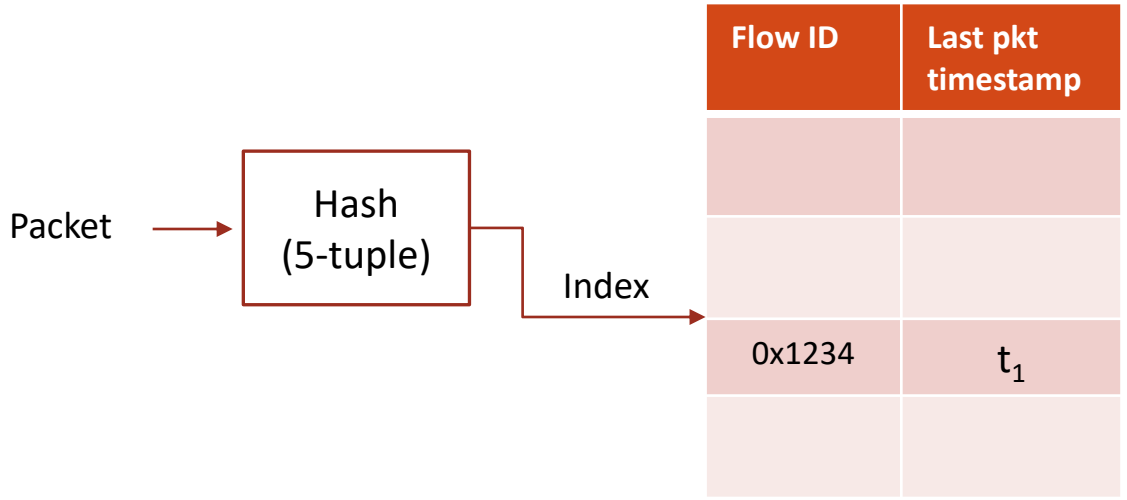
Hashing in P4

- The Interarrival time (IAT) is the time between two consecutive packets belonging to the **same flow**
- A flow can be identified by its 5-tuple fields:
  - Source IP address
  - Destination IP address
  - Source port
  - Destination port
  - Protocol
- It is possible to hash multiple fields in P4 and get a single digest value
- Cyclic Redundancy Check (CRC) is an example of a hash algorithm provided by the v1model

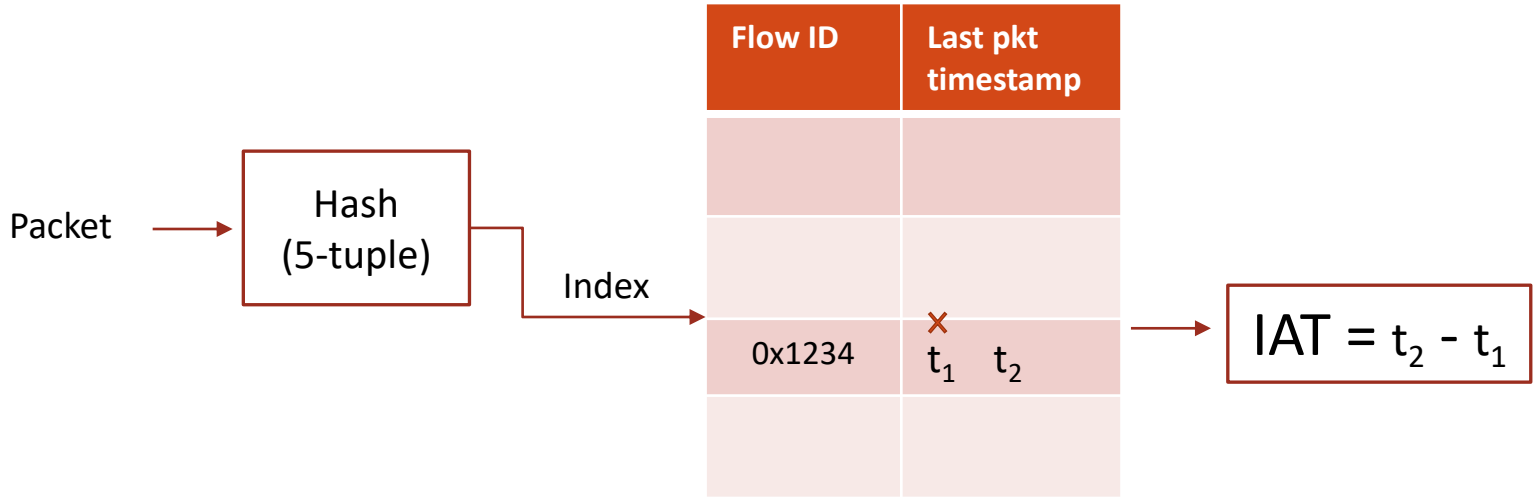
IAT Calculation in P4



IAT Calculation in P4



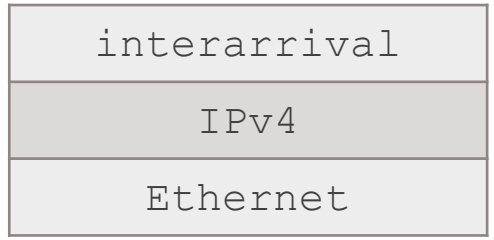
IAT Calculation in P4

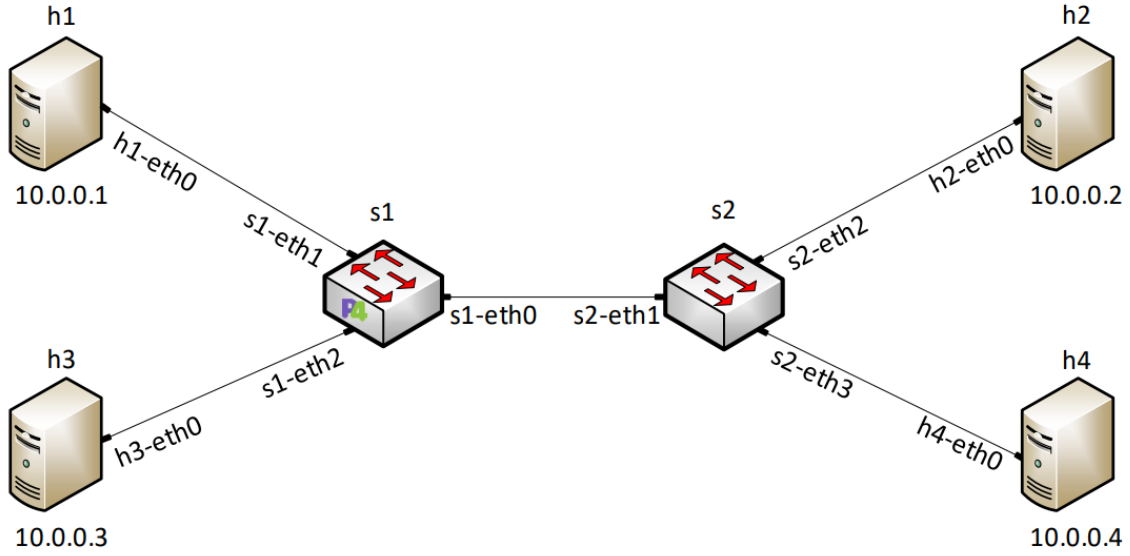


Lab Topology and Objectives

- The topology consists of four hosts: h1, h2, h3 and h4; one P4 switch: s1; one legacy switch
- The hosts h1 and h3 send packets with a custom header (`interarrival`)
- A flow is identified by the source IP and the destination IP of the packet
- The P4 switch s1 computes the IAT and inserts its value into the custom header
- Hosts h2 and h4 receive packets from hosts h1 and h3, respectively
- The IATs are shown on hosts h2 and h4

- Headers:





Accessing the Platform

- Please use the following link to access the platform: https://netlab.cec.sc.edu/
- Login using the following credentials:
- **Username:** email used for registration
- **Temporary Password:** nsf2024