CAN201 In-Class Test 3

DoS attacks against the Data Plane of an SDN Network

Objective

In this in-class test, you are tasked with executing a Denial of Service (DoS) attack targeting the switch's flow table within a Software-Defined Networking (SDN) environment. The purpose of this test is to have you identify the security vulnerability involved and propose a solution to mitigate it.

Task Description

According to the given controller application (called lab11.py) to conduct the DoS attacks.
Run the following command to flooding the flow table.

```
h1 hping3 h2 -c 10000 -S --flood --rand-source
```

Answer the following questions:

1. What is the initial flow entry (before attacking) installed in the switch of this lab?
2. Explain what this initial flow entry does.
3. Show the flow 'match' rule (in the lab11.py) used to cope with the above flooding traffic.
4. Explain how the flooding command exhausts the switch's flow table?
5. Revise the flow 'match' rule in the original lab11.py file to solve the vulnerability.

Grading Criteria (Total: 5 points)

1. **Report (4 points)**
   o In the report, for Q1, display the correct initial flow entry (**1 point**).
   o In the report, for Q2, provide the correct explanation (**1 point**).
   o In the report, for Q3, identify and show the flow 'match' rule (**1 point**).
   o In the report, for Q4, provide the correct explanation (**1 point**).
2. **Revised python file (1 point)**
   The revised lab11.py file can run successfully for addressing the vulnerability (**1 point**).

Penalty Rules for Late Submission

1. [No penalty] Submission before the lab session due.
2. [5% penalty] Submission within 24 hours after the due.
3. [10% penalty] Submission within 2 days
4. [15% penalty] Submission within 3 days.
5. [20% penalty] Submission within 4 days.
6. [25% penalty] Submission within 5 days.

Submission Guidelines

1. ZIP file (name): In-class Test3_StudentName_StudentID.zip
   This zip file includes:
   1.1 Report PDF file (name): report_studentName_studentID.pdf
   1.2 Revised python file (name): lab11_studentName_studentID.py
2. Submission: upload the ZIP file through the submission link on LMO.