

Demo 4 - OpenFlow flow tables

This assignment is divided into two different tasks. The first task is provided with a pre-defined topology wherein students are asked to create flow rules to achieve the defined objective. The second task requires the creation of a topology with restrictions imposed by flow rules.

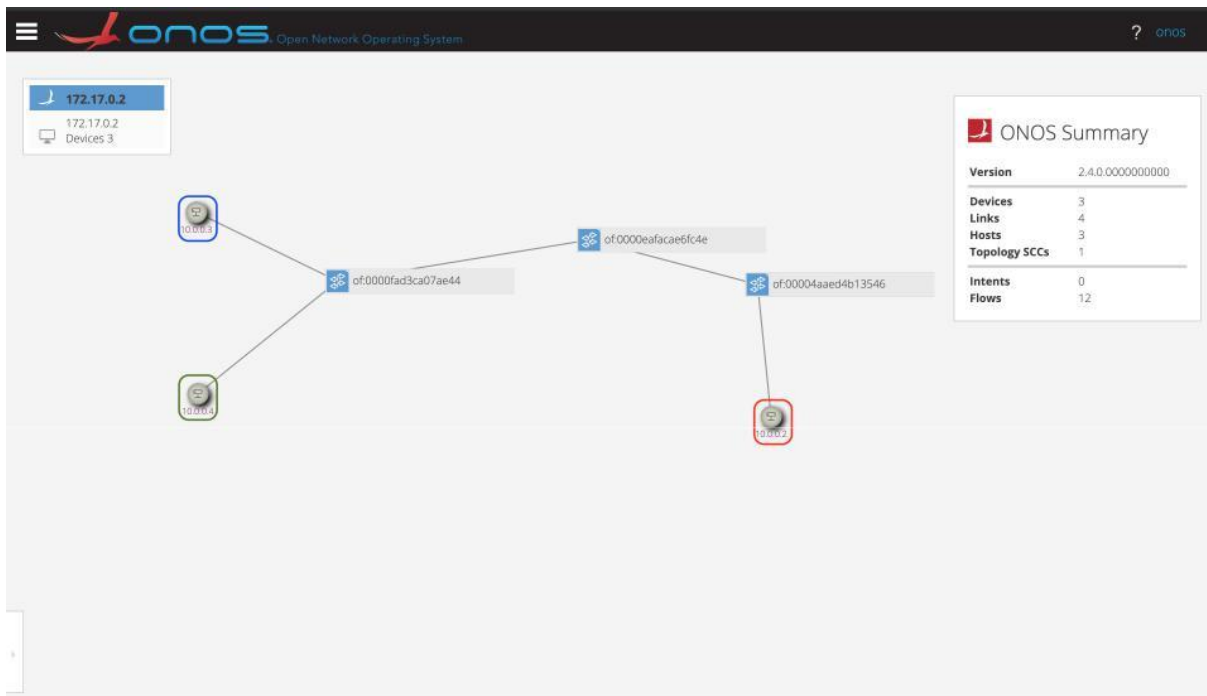


Figure 5: Task 3.1 Topology.

In this assignment, you are requested to carry out the following tasks:

Task 3.1

The file related to Task 3.1 is available in MyCourse under “Demo 3 - ONOS and Linux Containers.” This shell script creates a topology as depicted in Fig. 5. A host in the ONOS’s GUI is a namespace, however, LXC container can be used. In this task you are asked to:

- Create the first flow rule to block the ICMP traffic from the “Blue” namespace to the “Red” namespace.
- Create the second flow rule to block the traffic to the “Red” namespace.
- Create the third flow rule to allow total access to the “Red” namespace from the “Green” and the “Blue” namespaces.
- Do you need to delete the second flow rule to activate the third flow rule?
- Create a flow rule to allow only Http and Https traffic to the “Red” namespace.

Note that for each flow rule, the student is asked to provide details on the entered rule and explanations. Use only the OVS command line to enter the flow rules.

Task 3.2

The objective of this task is to create a pseudo–Network Slice based on namespaces and OVSs.

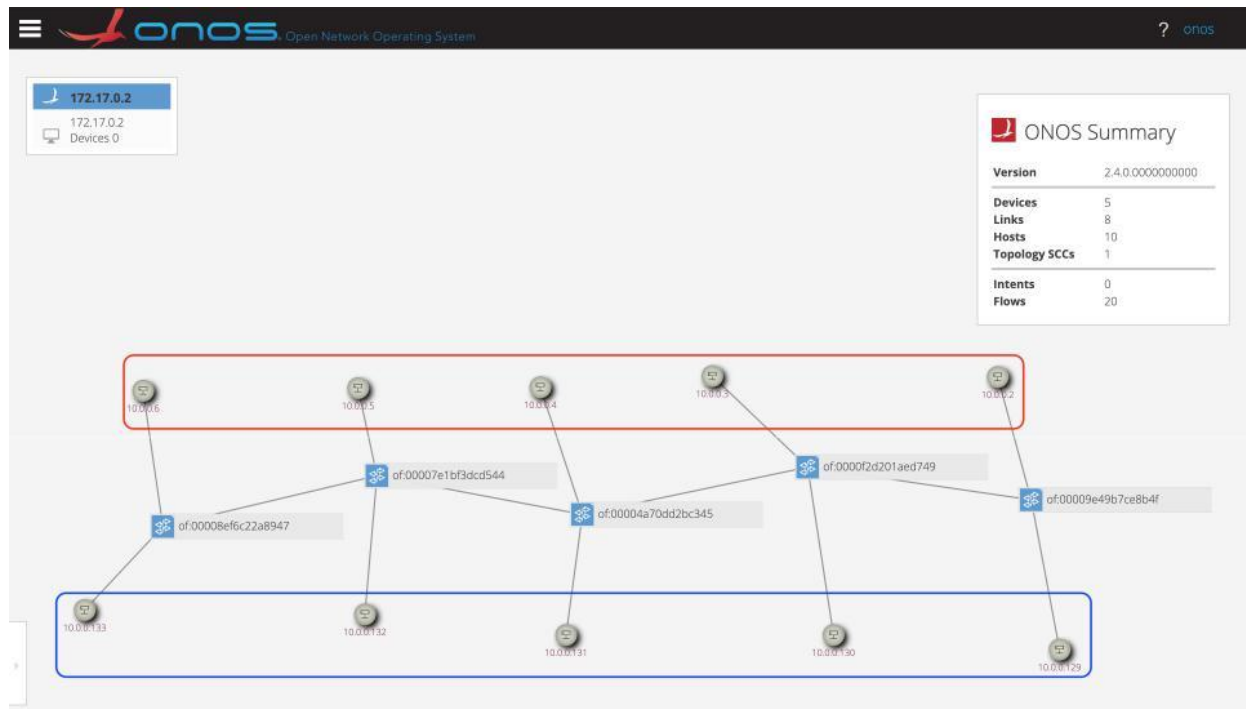


Figure 6: Task 3.2 Scenario.

- Create a linear topology of 5 switches and 10 hosts (as in Fig. 6). In a linear topology, each switch has two connections with other switches except the first and the last ones. Each switch contains two hosts, one for the "Red" slice and one for the "Blue" slice.
- After creating this topology, you are asked to create two slices, "Red" and "Blue", each slice is totally separated from the other without any toleration for shared access between them. To do that, you may write a shell script or a python-based code, your code must be well-commented and following coding principles and naming conventions. Your solution may leverage OVS's CLI to create the necessary flow rules. Note that all hosts are in the same network range.
- Redo the isolation using another approach that differs from the one you have used in the previous question.

Explore the usage of VLANs, this may help to solve one of the questions.

1. Submission Guidelines

The deadline to submit the solutions through MyCourses is on **22.03.2022** at 10h00 for Demo 4. Your submission should contain answers to the questions asked in the text, the

code with solutions used for the assignment. If you need help or clarification solving the exercises, you are welcome to ask between 10:00 and 12:00 on Thursday 17.03.2022.

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The deadline to submit your solution to Demo 3 is 22.03.2022, 10:00 a.m.

For delayed submissions, 15% of the total score allocated for this assignment will be deducted.

Submissions of Demo 4 made after 24.03.2022 will not be accepted.

Good luck!