

# FABRIC Educational Materials

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## Tutorial: OpenFlow With Controller (Ryu)

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### Introduction

The goal of this exercise is to introduce the user to the benefits of switches in networks

### Running the Tutorial

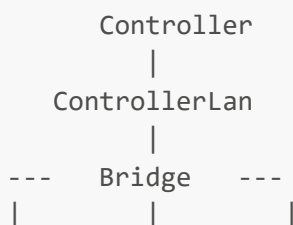
- The tutorial has three Jupyter notebooks and one folder:
  - **CreateSlice.ipynb**: Creates the FABRIC slice/topology needed for this tutorial
  - **OpenVS\_Ryu.ipynb**: Configures the IPv4/IPv6 network address and then begins the Queues tutorial
- To run the tutorial:
  - Login to the FABRIC Portal and JupyterHub
    - Login to the [FABRIC Portal](#)
    - Login/connect to the [FABRIC JupyterHub](#)
  - Download the latest copy of the tutorials from GitHub
    - Open a terminal in JupyterHub by clicking the "Terminal" tile under "Other" in the Launcher tab
    - In the terminal window, type the following commands to download (pull) the latest version of the set of tutorials from Github

```
mkdir teaching-materials
cd teaching-materials
git clone https://github.com/fabric-testbed/teaching-materials.git
```

- Run the Tutorial Notebooks
  - In the left-hand column of JupyterHub, navigate to the SystematicExperimentation folder
  - Open and execute the CreateSlice.ipynb notebook
  - Then open and execute the SystematicExperimentation.ipynb

### Create Slice Notebook

- In this notebook you will request a slice that contains 5 nodes (Host1, Host2, Host3, Bridge and a Controller node) and four Layer-2 networks (LANs) with the following configurations:



H1LAN	H2LAN	H3LAN
Host1	Host2	Host3

- Each node should have the following requirements:
  - NIC\_Basic model
  - "default\_ubuntu\_20" image
  - 1 cores
  - 2 ram
  - 10 disk space
- To successfully run this notebook you should only need to run the code blocks in order from top to bottom
- **Notes:** If your slice creation fails you can just try to specify a site in the second code block run them again. (you can get a site from "https://portal.fabric-testbed.net/" by looking at the map, use the name **outside** of the parenthesis and make sure the site chosen is up)

## Exploring Ansible Notebook

- To successfully run this notebook you need to run the code blocks first (*Retrieve Slice*) and then follow the steps in (*Guided Experiment*):
  - Retrieve Slice: This step is not required but it will allow you to easily access the nodes in the slice you will use for the experiment.
  - Guided Experiment: This is the Experiment, To complete this section just follow the provided instructions to complete the exercise.

## Additional Information

- FABRIC Learn Website: If you encounter problems, questions, or suggestions, please navigate to the FABRIC Knowledge Base at <https://learn.fabric-testbed.net/>
- FABRIC Teaching Material Github: <https://github.com/fabric-testbed/teaching-materials>
- This assignment was originally written for the GENI network (<https://groups.geni.net/geni/wiki/GENIEducation/SampleAssignments/IPRouting/Procedure>), but has been converted to run in FABRIC.