

# FABRIC Educational Materials

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## Tutorial: Traffic Generation

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### Introduction

The goal of this exercise is to introduce the user to traffic generation using Nping

### Running the Tutorial

- The tutorial has three Jupyter notebook:
  - **CreateSlice.ipynb**: Creates the FABRIC slice/topology needed for this tutorial
  - **TrafficGeneration.ipynb**: Configures the IPv4/IPv6 network address, installs tools needed and then begins the Traffic 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 Traffic Generation tutorial
  - Open and execute the CreateSlice.ipynb notebook
  - Then open and execute the steps on TrafficGeneration.ipynb

### Overview of the Notebooks in this Tutorial

#### Create Slice Notebook

- In this notebook you will request a slice that contains two nodes (ND1 and ND2) and one Layer-2 networks (LAN) with the following configuration:

```
ND1 <-> LAN 1 <-> ND2
```

- 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)

## Traffic Generation 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.
  - Assignment: you will answer questions and use what you learned to create a graph of the traffic generated by nping.
  - **Notes:** In the case the slice fails to delete please examine the experiment tab on the fabric portal and delete the corresponding slice if it was not already deleted.

## 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://www.cs.unc.edu/Research/geni/geniEdu/08-TrafficGen.html>), but has been converted to run in FABRIC.