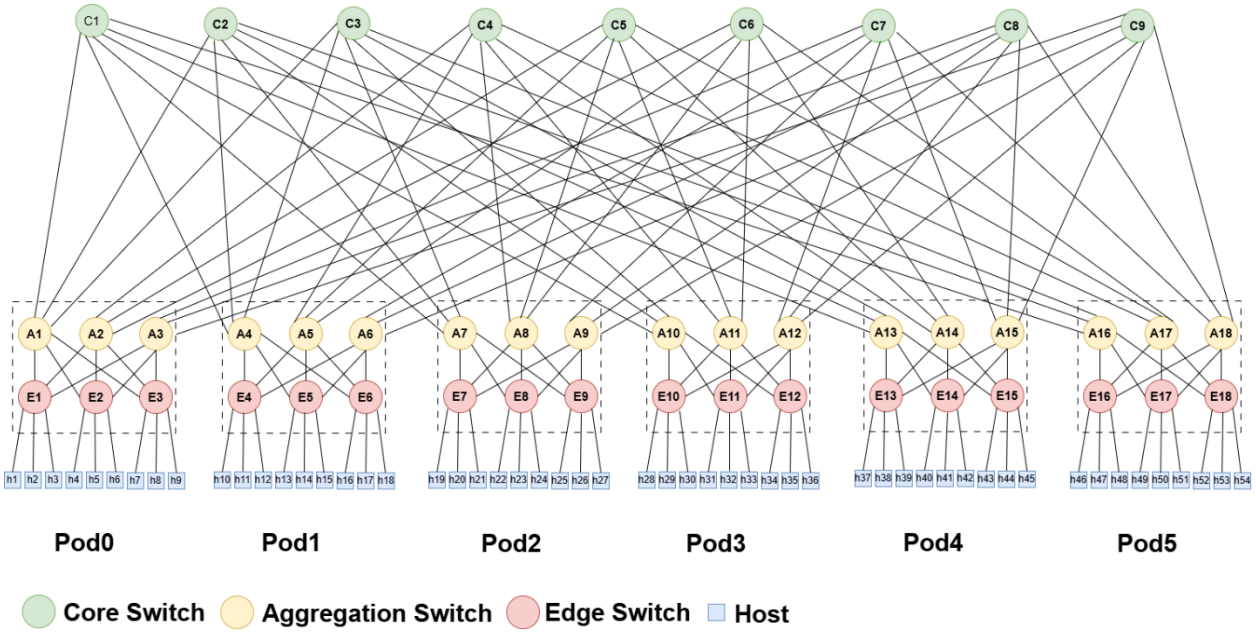
NEW YORK INSTITUTE OF TECHNOLOGY

INCS 775 – Data Center Security
Summer 2025
Dr: Zakaria Alomari
Assignment - 2
Total points: 100
Due date: Monday, *30 June 2025 / 11:59 PM*

Important: Thursday's Zoom class will be primarily dedicated to a lab session; however, we will also cover the following topics:

- FlowVisor
- What is Flow Space
- What is Flow Space Slicing
- Flow space slicing using FlowVisor
- FlowVisor Installation
- FlowVisor Configuration
- Create flowspaces

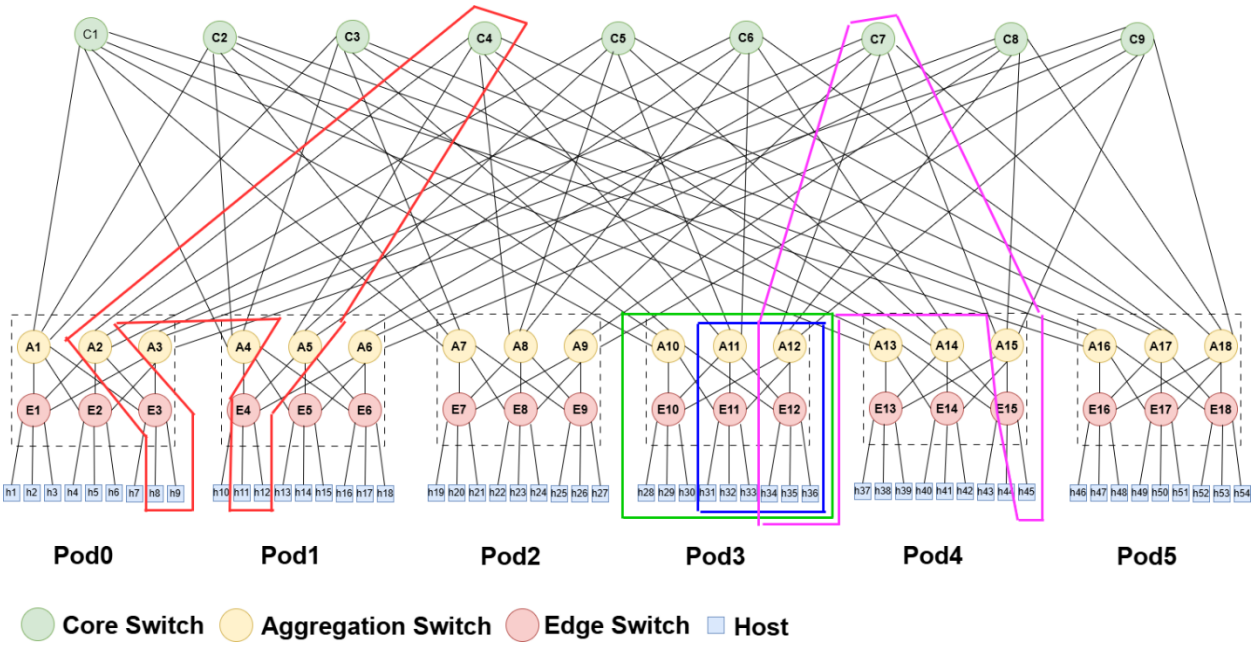
❖ Deploy the Data Center topology shown below and utilize a Python script to build a Fat-Tree Topology using Mininet.



❖ Create the Red Slice, Green Slice, Blue Slice, and Pink Slice using FlowVisor:

- Red Slice spans h8, h9, h11, h12, E3, A2, C4, A5, and E4. It enables bi-directional communication between only all the hosts in this slice (h8, h9, h11, and h12). This slice will be controlled by a controller running on TCP port 4000.
- Green Slice spans h28, h29, h30, h31, h32, h33, h34, h35, h36, E10, E11, E12, A10, A11 and A12. It enables bi-directional communication between only all the hosts in this slice (h28, h29, h30, h31, h32, h33, h34, h35, and h36). This slice will be controlled by a controller running on TCP port 5000.
- Blue Slice spans h31, h32, h33, h34, h35, h36, E11, E12, A11 and A12. It enables bi-directional communication between only all the hosts in this slice (h31, h32, h33, h34, h35, and h36). This slice will be controlled by a controller running on TCP port 6000.

- Pink Slice spans **h34, h35, h36, h45, E12, A12, C7, A15** and **E15**. It enables bi-directional communication between only all the hosts in this slice (**h34, h35, h36, and h45**). This slice will be controlled by a controller running on TCP port **7000**.



What to submit?

- Put the following files inside a compressed folder named **<lastname_firstname.zip>**
- Create a text file called **Group_info** and fill it with the **names** and **student IDs** of each group member.
- **Custom_Fatt-Tree.py** - - script containing the code to construct the Fat-Tree topology using Mininet.
- Files created by executing the following commands:
  - `fvctl -f pwd list-slice-info Red &>Red` (5)
  - `fvctl -f pwd list-slice-info Green &>Green` (5)
  - `fvctl -f pwd list-slice-info Blue &>Blue` (5)
  - `fvctl -f pwd list-slice-info Pink &>Pink` (5)
  - All the flowspace allocated to the Red slice **&>Red_FS** (15)
  - All the flowspace allocated to the Green slice **&>Green_FS** (15)

- All the flowspace allocated to the Blue slice &>Blue_FS (15)
- All the flowspace allocated to the Pink slice &>Pink_FS (15)
- Displays all flowspace rules currently managed by FlowVisor, illustrating how network traffic is partitioned and assigned to various SDN controllers (or "slices"). This is achieved using the following command:

  ```
  fvctl -f pwd list-flowspace &> flowspace
  ```
  (20)