

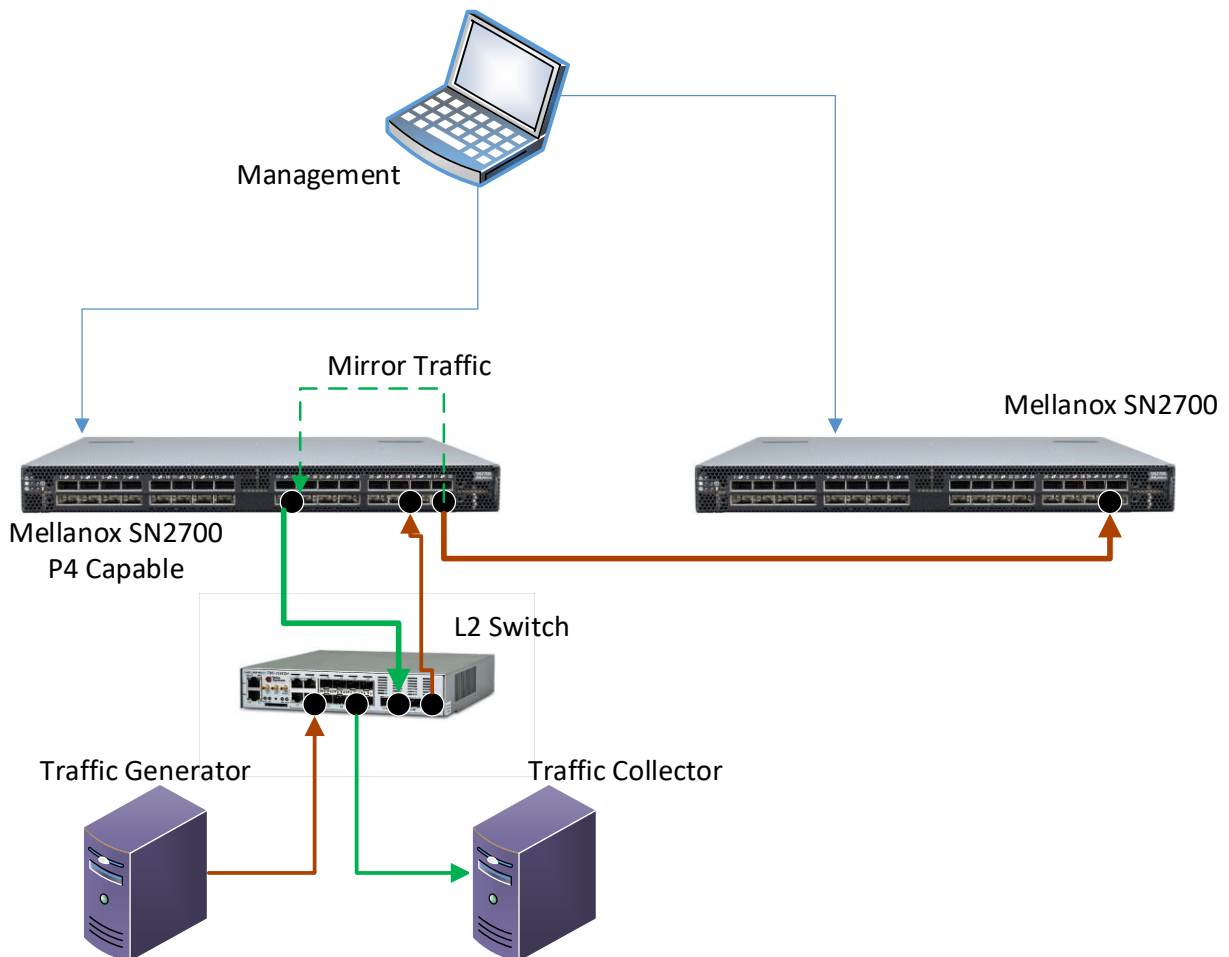


## Traffic Mirror on Mellanox Switch Programmed by P4

### Abstract:

Programming Protocol-independent Packet Processor (P4) is a high-level language that can be deployed in the future into Software Defined Networks (SDN) and can actually serve as an alternative to OpenFlow that is currently used – due to its flexibility and ability program the data plane and support emerging new protocols.

Traffic Mirror is a fundamental requirement of any legacy L2/L3 switch. It used mainly for trouble shooting in case of some irregular network event. Any P4 capable switch must support mirroring and in later stage mirroring of sampled traffic.





## Goals:

The project's objective is to learn P4 programming language and deploy it on Mellanox P4 Capable switch (SN27000) . The project will include the following phases:

- Learn the P4-16 language
  - Refer to <http://p4.org/>
  - Read [http://p4.org/wp-content/uploads/2017/05/p4\\_d2\\_2017\\_p4\\_16\\_tutorial.pdf](http://p4.org/wp-content/uploads/2017/05/p4_d2_2017_p4_16_tutorial.pdf)
  - Perform BMV2 simple switch exercises per -  
[https://github.com/p4lang/tutorials/tree/master/P4D2\\_2017/exercises](https://github.com/p4lang/tutorials/tree/master/P4D2_2017/exercises)  
[https://github.com/p4lang/tutorials/tree/master/examples/copy\\_to\\_cpu](https://github.com/p4lang/tutorials/tree/master/examples/copy_to_cpu)
- SW phase:
  - Get from Mellanox simple switch SW p4 target and add to it Mirror functionality. Verify the mirror and switching functionality in Mininet environment
- HW Phase:
  - Get from Mellanox P4 Target Architecture for SN27000 switch with its backend compiler and P4runtime API. Add to it the P4 program that performs port mirroring. Compile and test mirror functionality on above setup
  - Demo the following:
    - Mirror port
    - Mirror port with certain VLAN encapsulation
    - Mirror certain flow (5-Tuple) on port with VLAN encapsulation
    - Ability to modify on-the-fly the following mirroring options:
      - Start / stop Mirror
      - Source / Destination port
      - Flow ID
- (Nice to have) Integration with ONOS SDN Controller:
  - Demo mirror port management functionality done from ONOS CLI



**Requirements:**

Introduction to Networking Course (236334)

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