



SIMULATING NETWORK DISCRIMINATION BY INTERMEDIARIES ON THE THE INTERNET

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Computer Science

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Our Team

- 2 CSUN Students – Computer Science
- 2 Community College Students (CoC) – Computer Information Technology
- Development Team & IT Team (DevOps)
- One large project – Two different components

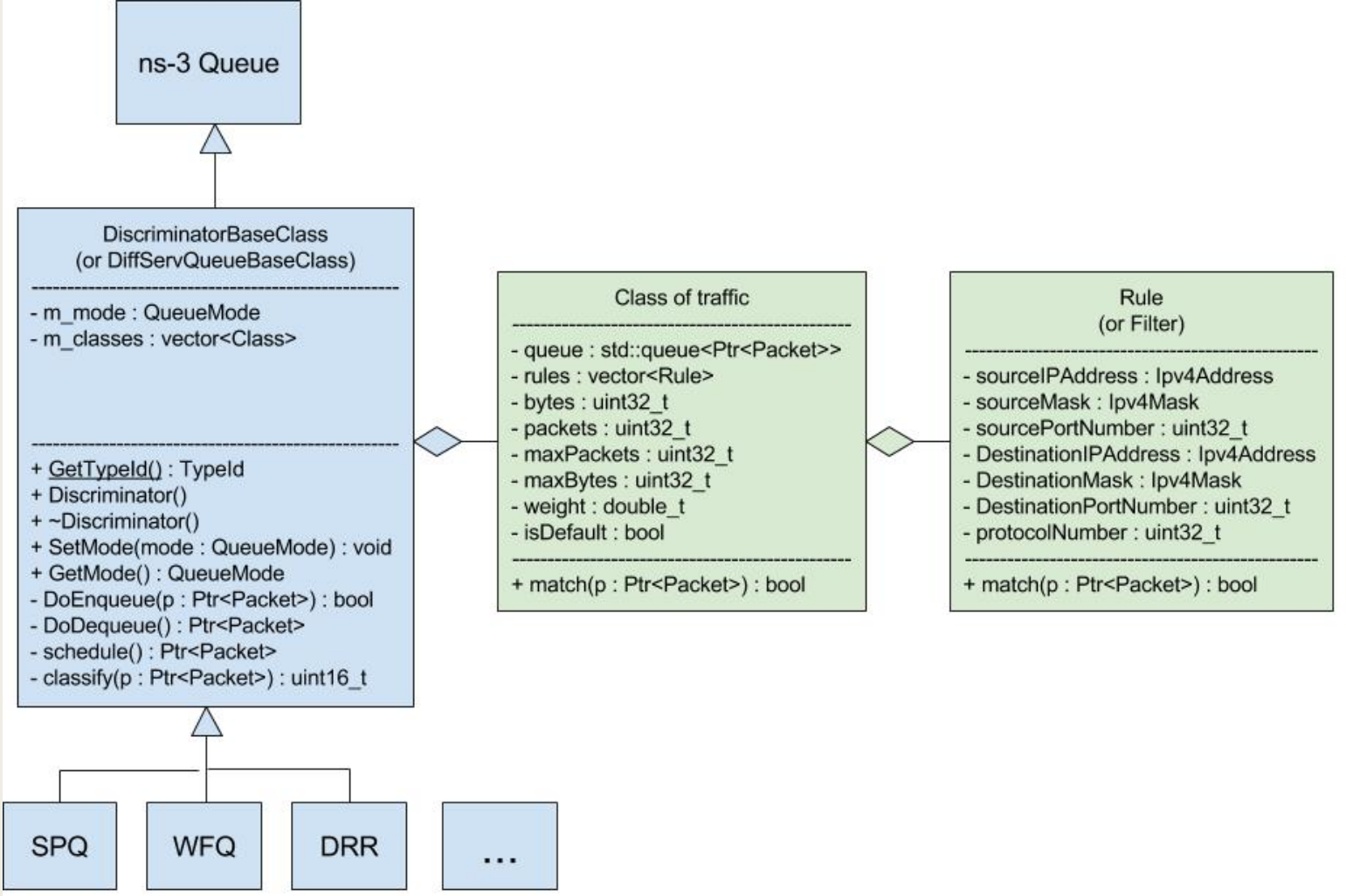
Why DevOps?

- DevOps (development and operations) is an enterprise software development phrase used to mean a type of agile relationship between Development and IT Operations. The goal of DevOps is to change and improve the relationship by advocating better communication and collaboration between the two business units.
- There are technical benefits: Continuous software delivery, Less complexity to manage, Faster resolution of problems.
- There are cultural and business benefits as well.
- Widely accepted practice in industry.

The Project

- Title: “Simulating Network Discrimination by Intermediaries on the the Internet”
- Design an abstract base class “Discriminator”
- Implementation in two widely known network simulators NS-3 and Click
- Validation with comparing performance with real switches and routers

The Project: The Dev Team



The Project: The IT Team



```
switch# show auto qos
Initial configuration applied by AutoQoS:
wrr-queue bandwidth 20 1 80 0
no wrr-queue cos-map
wrr-queue cos 1 0 1 2 4
wrr-queue cos 3 3 6 7
wrr-queue cos 4 5
mls qos map cos-dscp 0 8 16 26 32 46 48 56
!
interface FastEthernet0/3
mls qos trust device cisco-phone
mls qos trust cos
...
switch# show mls qos interface gigabitethernet0/1 statistics
Ingress
  dscp: incoming  no_change  classified  policed  dropped (in bytes)
    1 : 0           0           0           0         0
  Others: 203216935 24234242   178982693  0         0
Egress
  dscp: incoming  no_change  classified  policed  dropped (in bytes)
    1 : 0           n/a        n/a         0         0
WRED drop counts:
  qid  thresh1  thresh2  FreeQ
    1 : 0           0        1024
    2 : 0           0        1024
...
switch# show mls qos maps dscp-cos
Dscp-cos map:
  dscp: 0 8 10 16 18 24 26 32 34 40 46 48 56
        -----
        cos: 0 1 1 2 2 3 7 4 4 5 5 7 7
...

```

Current Status

- Dev Team: Implementation of Design 6.0 is ongoing.
- IT Team: Successfully configured and verified two Quality of Service features on Cisco Catalyst 3750. Currently working on configuring three new features on two other switches that support those features.