



Cyberpaths 2019 workshop

Failover and course
integration

Jakob Barnard
University of Jamestown
jakob.barnard@uj.edu



Workshop outcomes

- **Planned Lab**

- Goal of lab
- Original Sources
- Plan/Next Steps

- **Potential UJ Course utilization**

- ***CS325 – Networking – Every Spring***
- ***CS365 – Intro to Info Systems – Fall Even Years***
- ***CS490 – Advanced Info Systems – Spring Odd Years***
 - ***Introducing as a Special Topics course, more applied cyber security concepts.***

- Goal of this lab is to construct a tiered, somewhat repetitive approach.
- Emphasize the concept of failover and redundancy in network design
 - Utilize Geni to build a basic network design with redundant links
 - Use OpenFlow groups to configure those links
 - Perform analysis of network performance with both links up, a failed link, and if possible, a “failing” device to work on troubleshooting network errors.
 - Is it possible to identify the difference between physical network issues and evidence of a “compromise” in this config?

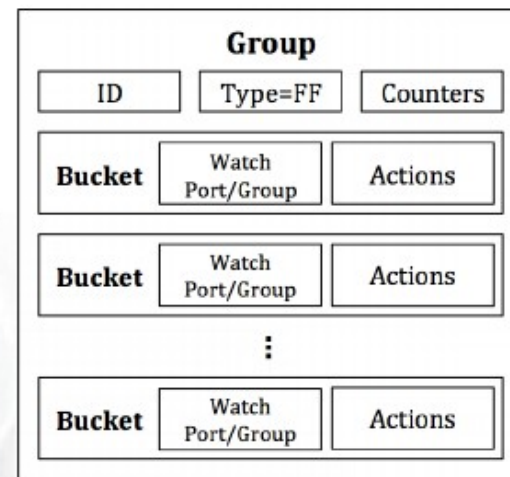
Planned Lab – OpenFlow - Failover

• Sources:

- [How to work with Fast-Failover OpenFlow groups](#)
 - Seems to be the original source of the lab
- [Geni Regional Workshop May 2018 files](#)
 - Seems to be presentations, one of which being a [better formatted writeup](#) of the lab above.
- [2016 slides](#) from the original Clemson/Geni authors on the lab somewhat better explaining the concepts

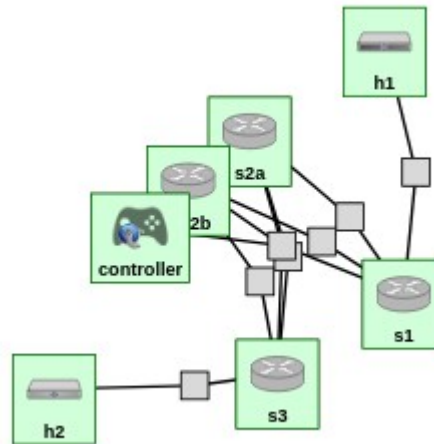
FAST-FAILOVER Group

- Use a *single bucket* for all packets
- Watch port/group as parameters
 - Determines “liveness” of bucket
 - If port/group is up, bucket can be used
 - If port/group is down, bucket cannot be used



Planned Lab – OpenFlow - Failover

- Solid original rspec
 - While dated, existing config seemed to work right
- Solid instructions provided
 - Would not give to intro networking students



Planned Lab – Good things about original lab

- Rspec was clearly developed a while ago
 - Taking one machine and upgrading from Ubuntu 14.04 to 16.xx to 18.04 was a failure. SSH died sometime during the full version upgrade and was unable to recover
- Likely going to be a bit too much for entry level networking and needs more security aspects added to be a CyberSec lab
 - Snapshot based or script creation?

Planned Lab – Bad things about original lab

• Potential UJ Course utilization

- **CS325 – Networking – Every Spring**
 - **IP Routing Exercise**
 - **OpenFlow Intro**
 - **OpenFlow Failover (Intro version)**
- **CS365 – Intro to Info Systems – Fall Even Years**
 - **Certificate Lab (Easy)**
 - **DoS Traffic**
 - **Intrusion Detection (Basic)**
 - **Password CTF**
- **CS490 – Advanced Info Systems – Spring Odd Years**
 - **OpenFlow (Advanced Infosec version)**
 - **Pen Testing Labs**
 - **Intrusion Detection Systems (Hard)**
- **Introducing as a Special Topics course, more applied cyber security concepts.**

UJ Courses for likely Geni usage

- **Jakob Barnard**

University of Jamestown

6041 College Lane

Jamestown, ND 58401

jakob.barnard@uj.edu

Website: professorb.info

Contact with any questions!