VIRL CI Workbench

Using VIRL in a NetOps Tool-chain

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Agenda

- Introduction
- VIRL APIs, Jenkins, GitHub
- Python tool, YAML-config
- Tying it together: Demo
- Hands-on Lab
- Q&A

Pod Assignments

- GitHub Repo **https://github.com/rschmied/gsx2018-virl**
- Pods are hosted on packet.net (the easy and fast VIRL cloud option)
- Type 0 servers (not very powerful but will do for the workbench)
- Have a **user 'guest'** with a **password 'gsx2018'**
- Pods go from **pod1.virl.info** to **pod8.virl.info**
- Make a note of the info above, log in from your workstation
- Don't mix up the pods ☺

Introduction

CI – Continuous Integration

- Why
- How
- Tools
- Specific Use Cases

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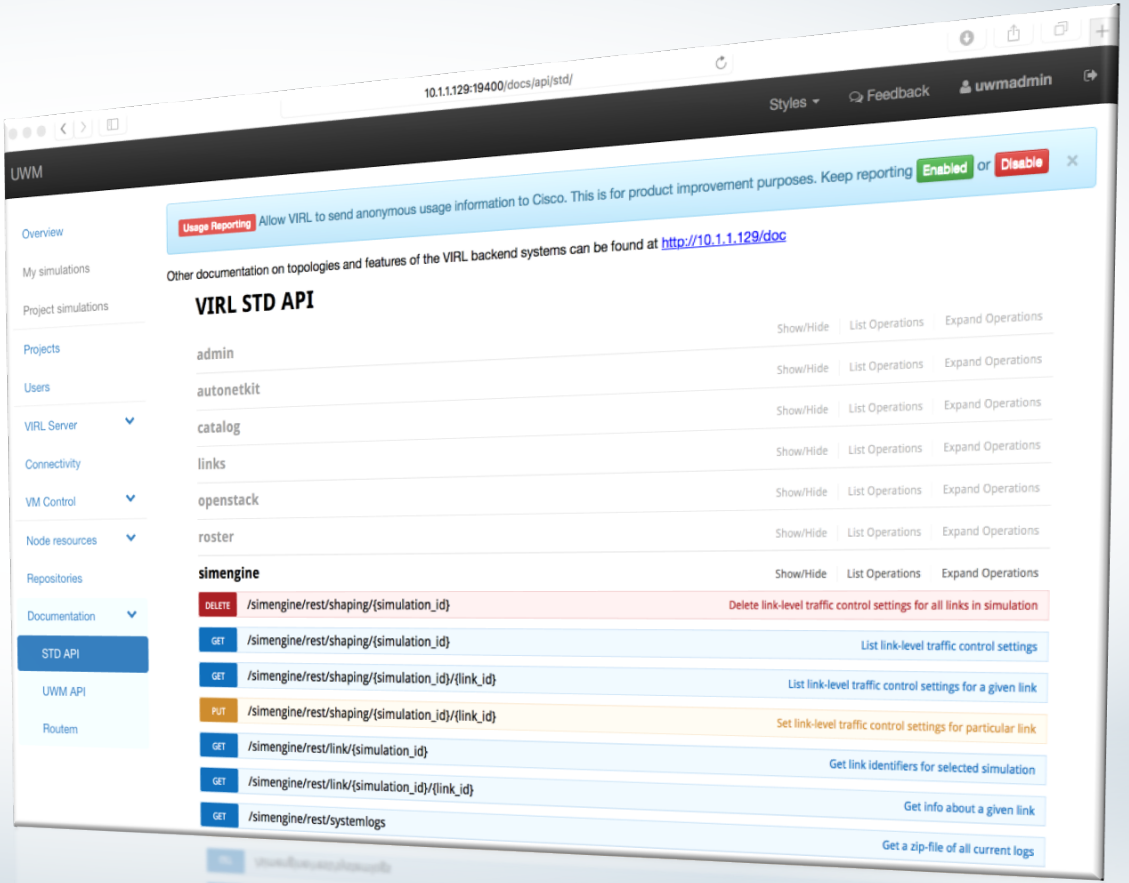
VIRL APIs

- Control entire Sim Lifecycle via API
- Complete documentation is built into VIRL
- Lists each RESTful call, parameters, and behaviors



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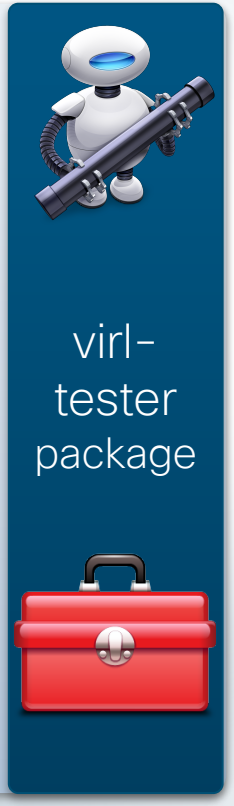
Required Tooling

- **GitHub**
  Topologies, Configurations, Tests

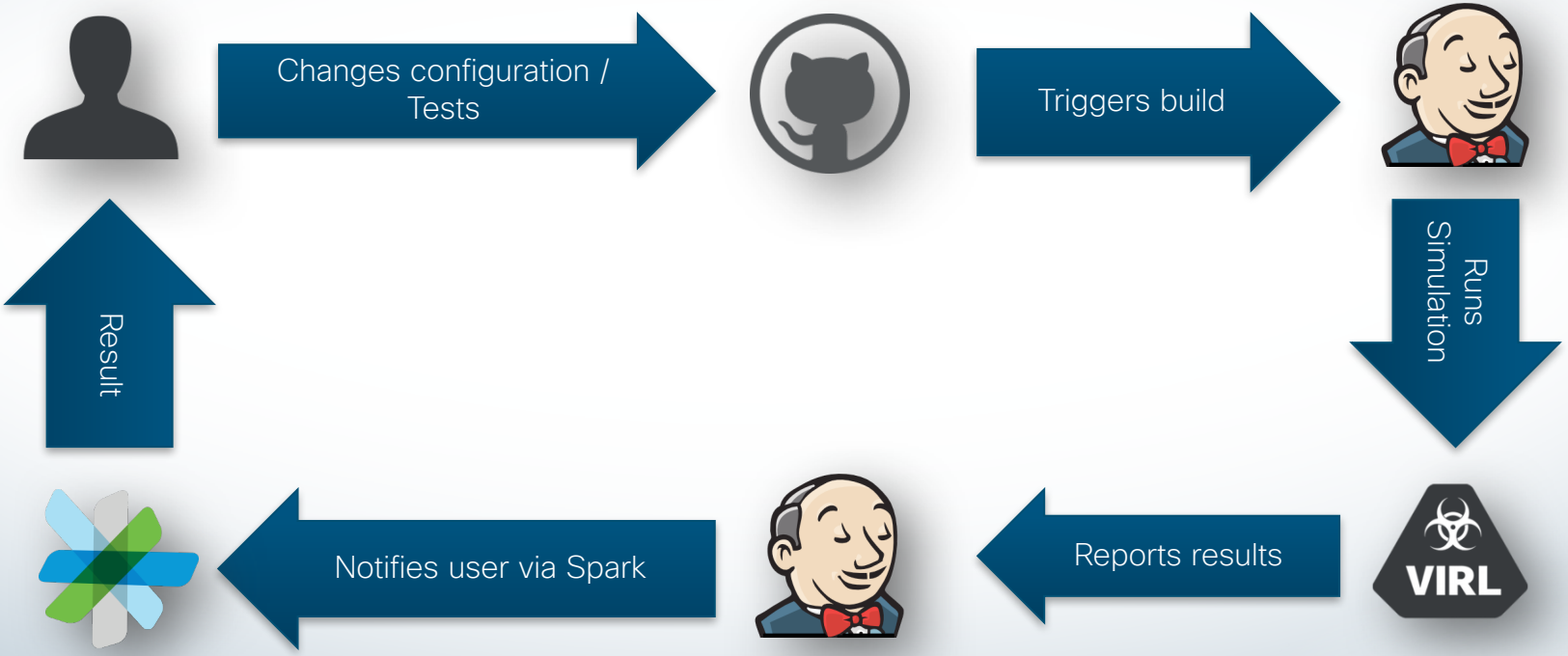
- **Jenkins**
  Gets notified, runs sim, reports success

- **VIRL**
  Simulates virtual network, executes tests

- **Cisco Spark and e-mail**
  Notify about success / failure



CI Workflow



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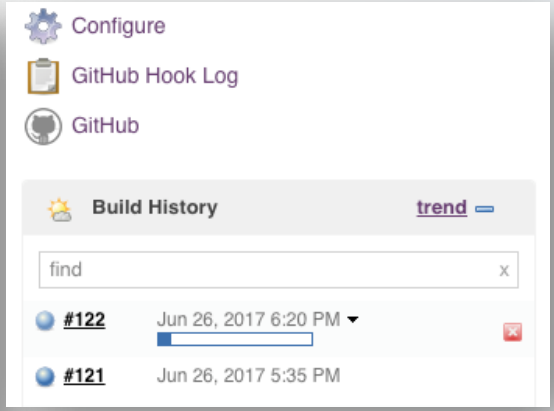
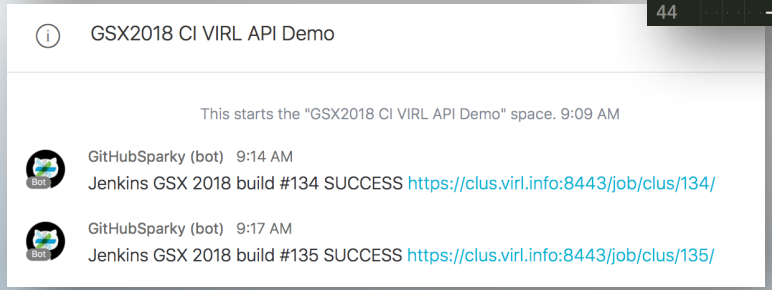
Sample Input / Output

```
5 ■■■■■ projects/IOSv/iosv-1.cfg
        @@ -81,6 +81,11 @@ interface GigabitEthernet0/2
81  81    no shutdown
82  82   !
83  83   !
      84 +interface GigabitEthernet0/0.100
      85 + encapsulation dot1Q 100
      86 + ip address 172.100.100.100 255.255.255.0
      87 + no cdp enable
      88 +!
84  89   !
85  90   router ospf 1
86  91     network 192.168.0.2 0.0.0.0 area 0
```

```
23
24 sims:
25 - topo: iosv-single-test.virl
26   nodes:
27   - lxc-1:
28     - type: command
29       transport: ssh
30       sleep: 10
31       in:
32       #- ping -W1 -c1 10.0.0.10
33       - ping -c5 10.0.0.10
34       - ping -c5 10.0.0.10
35       out:
36       - \ 0% packet loss
37   - lxc-2:
38     - type: command
39       transport: ssh
40       in:
41       - ping -W1 -c1 10.0.0.6
42       - ping -c5 10.0.0.6
43       out:
44       - \ 0% packet loss
```






```
>>> ping -W1 -c1 10.0.0.6
<<< PING 10.0.0.6 (10.0.0.6) 56(84) bytes of data.
    64 bytes from 10.0.0.6: icmp_seq=1 ttl=63 time=1.33 ms

    --- 10.0.0.6 ping statistics ---
    1 packets transmitted, 1 received, 0% packet loss, time 0ms
    rtt min/avg/max/mdev = 1.334/1.334/1.334/0.000 ms

>>> ping -c5 10.0.0.6
<<< PING 10.0.0.6 (10.0.0.6) 56(84) bytes of data.
    64 bytes from 10.0.0.6: icmp_seq=1 ttl=63 time=1.28 ms
    64 bytes from 10.0.0.6: icmp_seq=2 ttl=63 time=0.829 ms
    64 bytes from 10.0.0.6: icmp_seq=3 ttl=63 time=1.63 ms
    64 bytes from 10.0.0.6: icmp_seq=4 ttl=63 time=2.70 ms
    64 bytes from 10.0.0.6: icmp_seq=5 ttl=63 time=1.78 ms

    --- 10.0.0.6 ping statistics ---
    5 packets transmitted, 5 received, 0% packet loss, time 4003ms
    rtt min/avg/max/mdev = 0.829/1.647/2.708/0.625 ms
```

Demonstration

Hands-on Lab

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Cursory Steps / Guideline

In a Terminal...

- **`virl-tester.zip`** file in ~/ (home directory), unzip (creates virl-tester dir)
- Create virtual environment (**`python3 -m venv virl-ci`**), source settings (**`source virl-ci/bin/activate`**)
- Install tool into venv (**`pip install virl-tester`**)
- Clone example (**`git clone https://github.com/rschmied/gsx2018-virl.git`**), cd into it (**`cd gsx2018-virl`**)
- Explore directory in Atom (or editor of choice)

What we'll do / suggestions

1. Create and run topology in VIRL Web Editor (three node triangle)
2. Save topology locally into directory
3. Check for routes, ping-ability in live sim. Make note of input to send and expected output
4. Stop sim manually (resources!)
5. Create new test file (.yaml) based on existing file in dir '`gsx2018-virl`'
6. Run tester '`virltester –l4 yourtestfile.yml`'
7. Experiment ☺

Take-Away

- Automate with APIs!
- Repeatability!
- No fat-fingering
- When things fail, write a test

Resources

- Internal Repository for the Test Tool
  - https://wwwin-gitlab-sjc.cisco.com/rschmied/virl-tester.git
  - `git clone https://wwwin-gitlab-sjc.cisco.com/rschmied/virl-tester.git`
- Test Data Example
  - https://github.com/rschmied/clus-virl
  - https://wwwin-gitlab-sjc.cisco.com/rschmied/virl-tests.git
- Note: Better Documentation and Examples needed, contribute ☺

GSX Own it.