

# Practical Infrastructure as Code

You might boil the ocean, but you'll definatly kill everyone trying.

27 October 2015

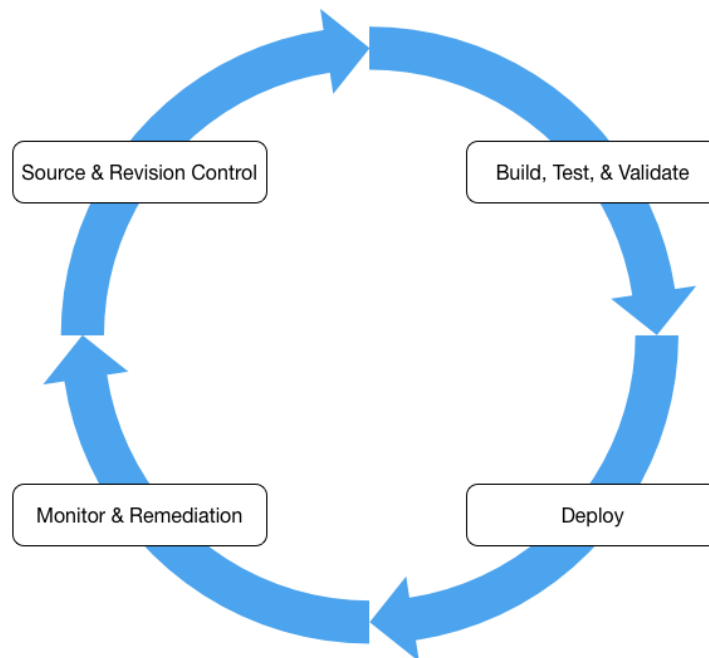
Matthew Stone

Technical Lead, Brocade Communications

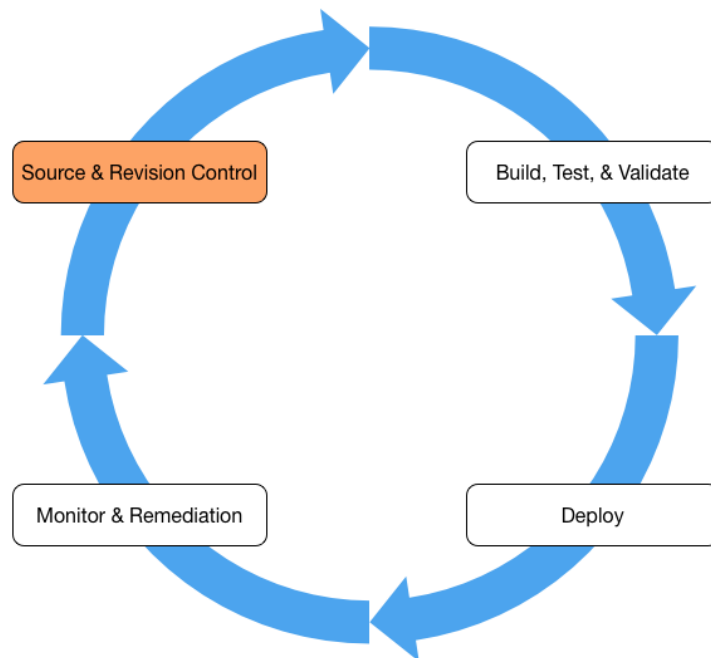




## Practical Infrastructure as Code



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## Source & Revision Control - Tooling

- Git
- SVN
- Mercurial
- Gerrit
- Phabricator

## Source & Revision Control - Revision Control

```
mstone at stone in ~  
$ mkdev network_test  
  
mstone at stone in ~/Dropbox/dev/network_test  
$ git init  
Initialized empty Git repository in /Users/mstone/Dropbox/Dev/network_test/.git/  
  
mstone at stone in ~/Dropbox/dev/network_test (master)  
$ echo "# Hello" > README.md  
  
mstone at stone in ~/Dropbox/dev/network_test (master)  
$ git add README.md  
  
mstone at stone in ~/Dropbox/dev/network_test (master)  
$ git commit -m "Initial Commit"  
[master (root-commit) 43eec17] Initial Commit  
1 file changed, 1 insertion(+)  
create mode 100644 README.md  
  
mstone at stone in ~/Dropbox/dev/network_test (master)  
$ echo "# Hello\nHello World" >> README.md  
  
mstone at stone in ~/Dropbox/dev/network_test (master)  
$ git add README.md  
  
mstone at stone in ~/Dropbox/dev/network_test (master)  
$ git commit -m "Changes"  
[master b28e6c0] Changes  
1 file changed, 2 insertions(+)  
  
mstone at stone in ~/Dropbox/dev/network_test (master)  
$ git diff 43eec179d84af5a9463197d85064b8be08a65067  
diff --git a/README.md b/README.md  
index fec5601..83cf826 100644  
--- a/README.md  
+++ b/README.md  
@@ -1,3 @@  
 # Hello  
+# Hello  
+Hello World  
  
mstone at stone in ~/Dropbox/dev/network_test (master)  
$
```

## Source & Revision Control - Peer Review

⚙ Differential > D1

### Initial Commit

☐ Needs Review

 All Users

Author [mstone](#)

Reviewers ☐ [stone](#)

Apply Patch `arc patch D1`

Subscribers *None*

Projects *None*

 **TEST PLAN**



## Source & Revision Control - Source & Syntax

- Templates
- Abstractions/DSL

## Source & Revision Control - Source & Syntax

```
---  
- name: Configure MLX VRF  
hosts: all  
gather_facts: no  
connection: local  
tasks:  
  - name: Configure VRF  
    mlx_vrf:  
      host={{ inventory_hostname }}  
      user={{ user }}  
      passwd={{ passwd }}  
      vrf_name={{ vrf_name }}  
      rd={{ rd }}  
      import_rt={{ import_rt }}  
      export_rt={{ export_rt }}  
      ip_routes={{ ip_routes }}
```

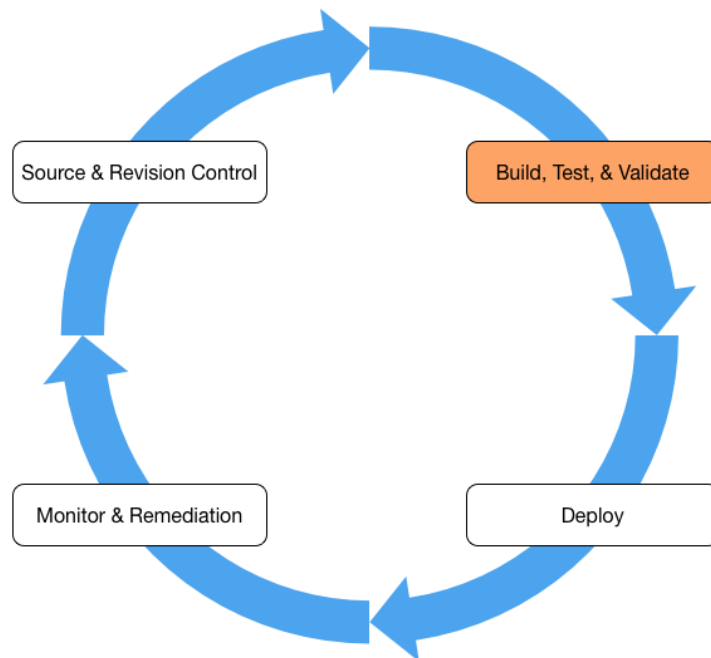
## Source & Revision Control - Source & Syntax

```
---  
vrf_name: test1  
rd: 15  
import_rt: 15  
export_rt: 15  
ip_routes:  
  - route: 10.10.10.0/24  
    gateway: 10.2.2.1  
  - route: 10.11.10.0/24  
    gateway: 10.2.2.1  
  - route: 10.12.10.0/24  
    gateway: 10.2.2.1
```

## Source & Revision Control - Source & Syntax

```
vrf CUST:{{ name }}  
  rd 30614:{{ rd }}  
  address-family ipv4  
    route-target export 30614:{{ exp-rt }}  
    route-target import 30614:{{ imp-rt }}  
    {% for route in routes %}  
      ip route {{ route.prefix }}/{{ route.mask }} {{ route.gw }}  
    {% endfor %}  
  exit-address-family  
exit-vrf
```

## Practical Infrastructure as Code



## Build, Test, & Validate - Tools

- Jenkins
- Travis CI
- ParallelCI
- ServerSpec

## Build, Test, & Validate - ServerSpec

```
require 'spec_helper'

describe interface('swp2') do
  it { should exist }
  it { should have_ipv4_address('172.16.2.4') }
end

describe bridge('bridge0') do
  it { should exist }
  it { should have_interface('swp38') }
  it { should have_interface('swp39') }
end

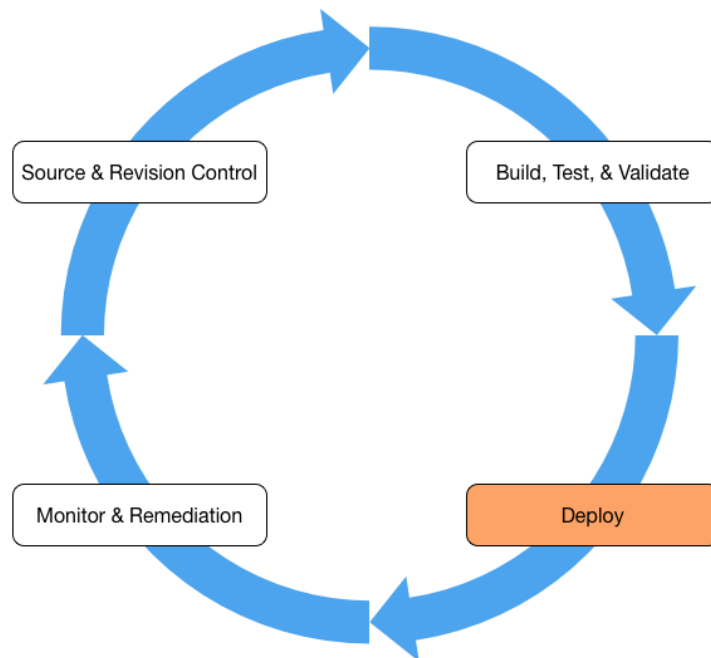
describe routing_table do
  it do
    should have_entry(
      :destination => '172.16.2.0/24',
      :interface => 'swp2'
    )
  end
end
```

## Build, Test, & Validate - State of the Union

- This needs work!
- Contact me - seriously.



## Practical Infrastructure as Code



## Deploy - Tools

- Ansible
- Puppet
- Chef
- Expect
- Neutron

## Deploy - Strategy

- Rolling Updates/Load Draining
- Scheduling

## Deploy - Ansible

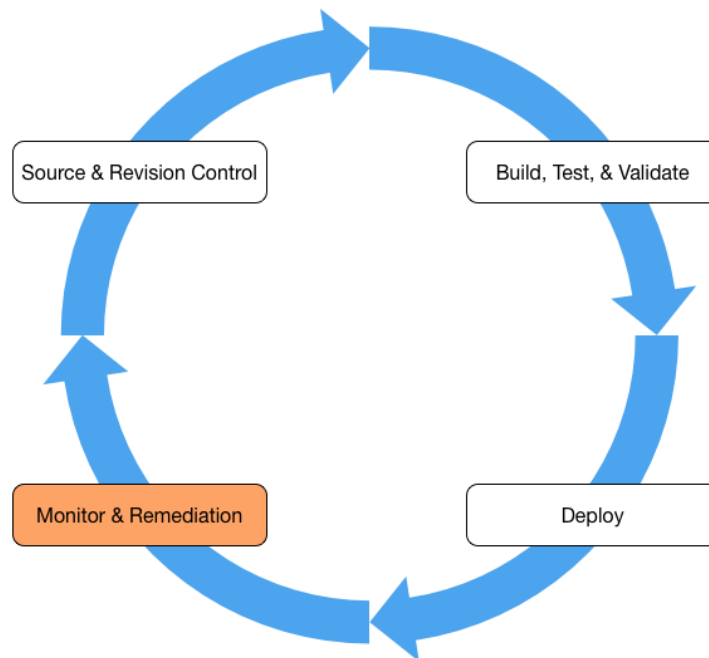
```
mstone at mstone in ~/Dropbox/dev/ansible/mlx_vrf (master*)
$ ansible-playbook -i hosts mlx_vrf.yml --extra-vars "@vars/test1.yml" -vvv
No config file found; using defaults
1 plays in mlx_vrf.yml

PLAY [Configure MLX VRF] *****

TASK [Configure VRF] *****
ESTABLISH LOCAL CONNECTION FOR USER: mstone
10.254.4.128 EXEC mkdir -p "$HOME/.ansible/tmp/ansible-tmp-1445907929.42-189454847002301" && chmod a+rx "$HOME/.ansible/tmp/ansible-tmp-1445907929.42-189454847002301" && echo "$HOME/.ansible/tmp/ansible-tmp-1445907929.42-189454847002301"
10.254.4.128 PUT /var/folders/vq/1xxlns855h3b9f47c79b1c40000gn/T/tmp6nQJl TO /Users/mstone/.ansible/tmp/ansible-tmp-1445907929.42-189454847002301/mlx_vrf
10.254.4.128 EXEC LANG=en_US.UTF-8 LC_MESSAGES=en_US.UTF-8 LC_CTYPE=en_US.UTF-8 /usr/bin/env python2.7 /Users/mstone/.ansible/tmp/ansible-tmp-1445907929.42-189454847002301/mlx_vrf:
f: rm -rf "/Users/mstone/.ansible/tmp/ansible-tmp-1445907929.42-189454847002301/" >/dev/null 2>&1
changed: [10.254.4.128] => {"changed": true}

PLAY RECAP *****
10.254.4.128      : ok=1    changed=1    unreachable=0    failed=0
```

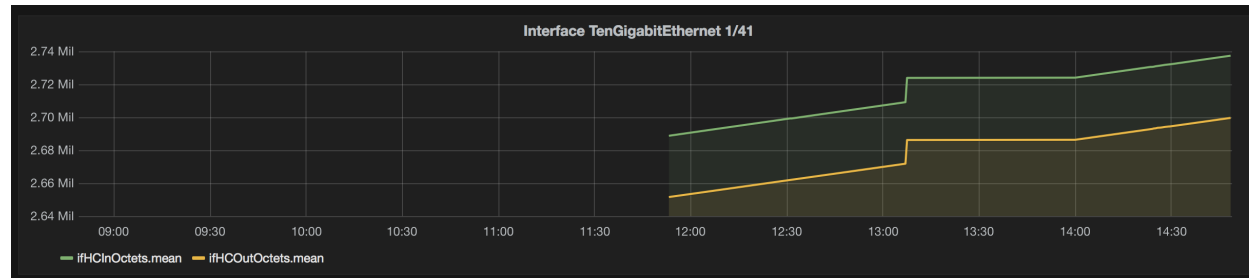
## Practical Infrastructure as Code



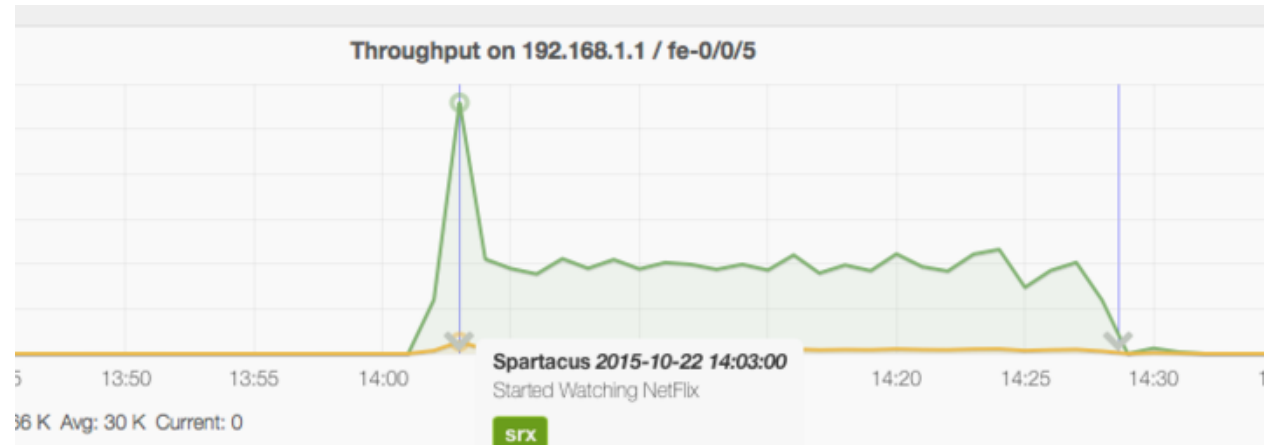
## Monitoring & Remediation - Tools

- SENSU
- InfluxDB/Grafana
- Fluentd/Logstash
- Elastic Search/Kibana
- StackStorm

## Monitoring & Remediation - InfluxDB/Grafana



## Monitoring & Remediation - InfluxDB/Grafana

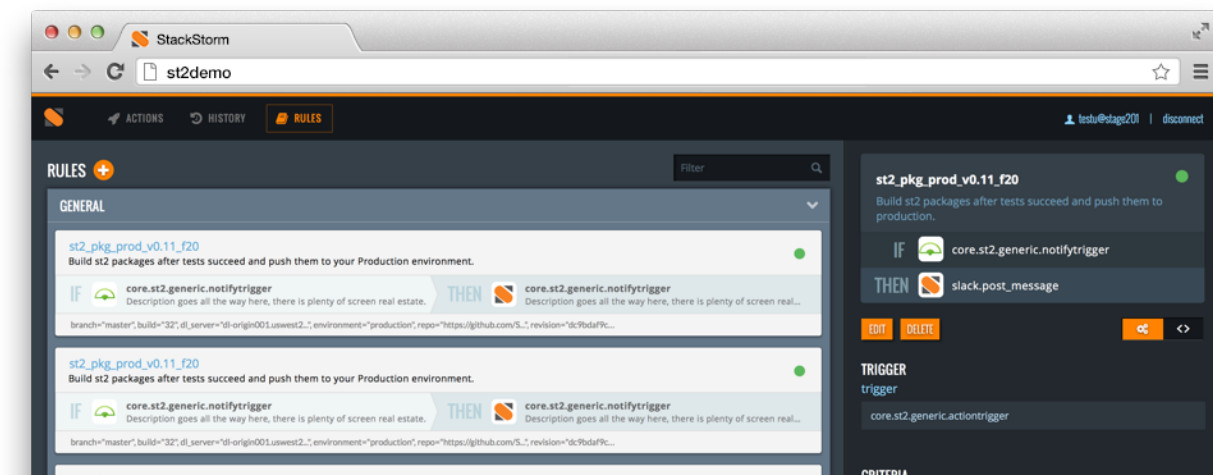




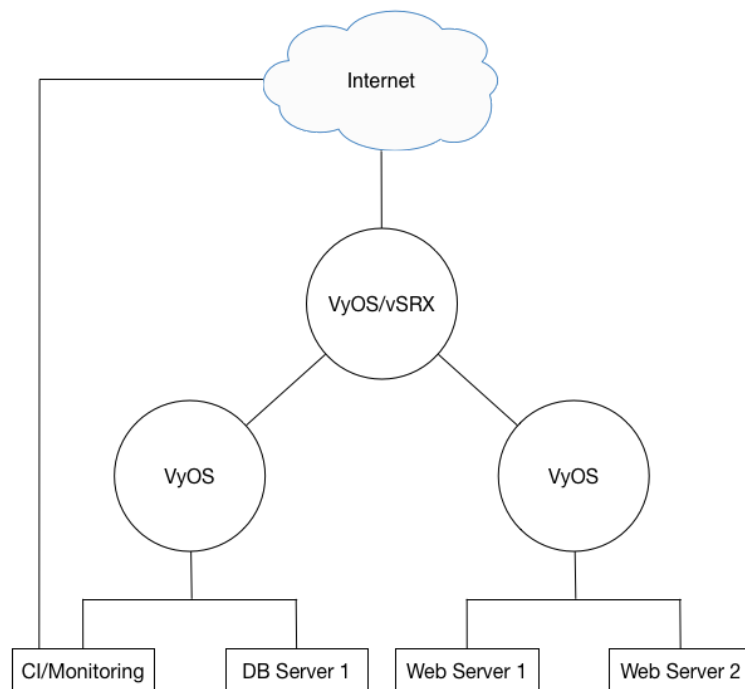
## Monitoring & Remediation - Kibana



## Monitoring & Remediation - StackStorm



## Future Example/Demo



## Future Example/Demo

- Phabricator
- Travis CI
- Sensu/InfluxDB/Grafana

## Thank you

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