

Automating Juniper Devices with Ansible

Overview

Who is sipgate?

The three whys:

- Juniper
- Automation
- Ansible

Setting up Ansible

Things that make your life easier

sipgate?



Choosing New Network Gear



Choosing New Network Gear

Panel 1	Panel 1	Panel 1		Panel 1	Panel 1	Panel 1
Panel 2	Panel 2	Panel 2		Panel 2	Panel 2	Panel 2
			Switch 1			

			Switch 2			
Panel 1	Panel 1	Panel 1		Panel 1	Panel 1	Panel 1
Panel 2	Panel 2	Panel 2		Panel 2	Panel 2	Panel 2

Choosing New Network Gear



QFX5100

Choosing New Network Gear



QFX5100

EX4300



What Does Automation Do For You?



What Does Automation Do For You?

Have you ever tried to...

What Does Automation Do For You?

Have you ever tried to...
...replace a broken device?

What Does Automation Do For You?

Have you ever tried to...

...replace a broken device?

...apply the exact same settings to multiple devices?

What Does Automation Do For You?

Have you ever tried to...

...replace a broken device?

...apply the exact same settings to multiple devices?

...apply the same template with varying settings to multiple devices?

What Does Automation Do For You?

Have you ever tried to...

...replace a broken device?

...apply the exact same settings to multiple devices?

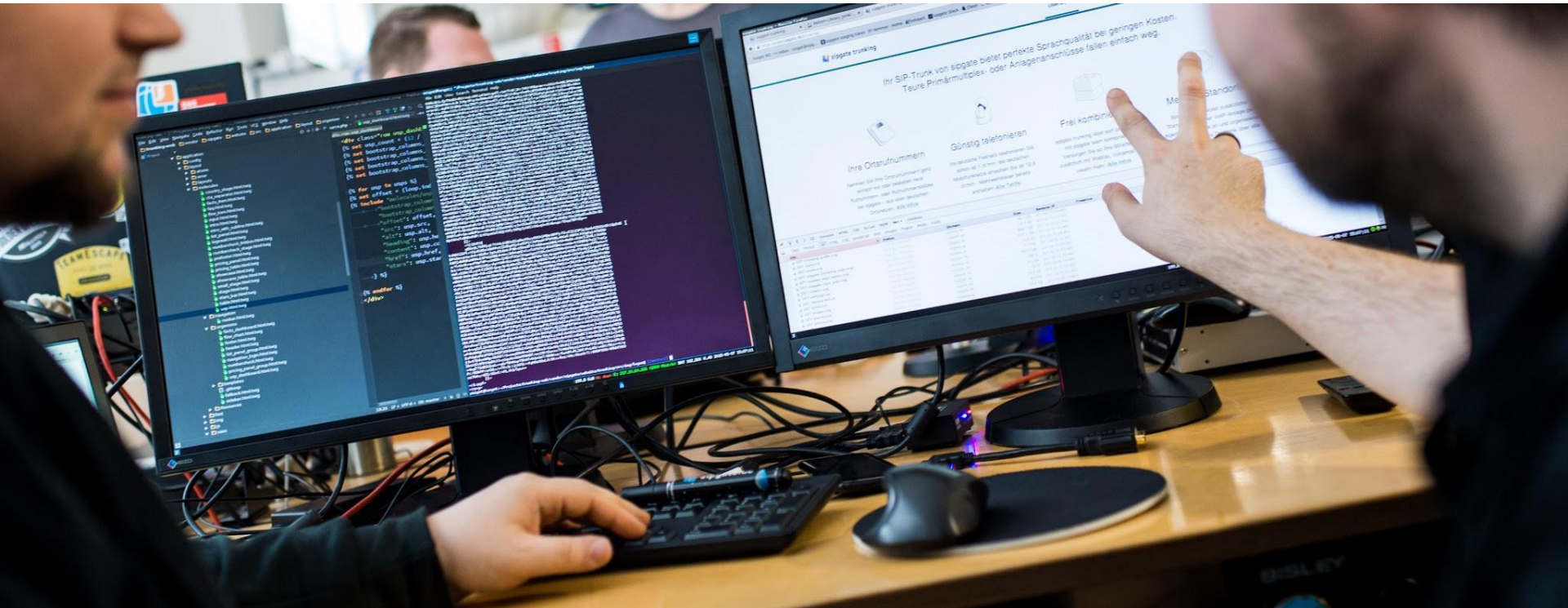
...apply the same template with varying settings to multiple devices?

(that old handcrafted perl script using some obscure outdated library relying on expect does not count!)

ChefAnsiblePuppetSaltstackWhatever?



Setting up Ansible for Juniper



Setting Up Ansible 2.2 For Juniper

```
# apt install \  
    python-pip libxml2-dev libffi-dev \  
    python-dev libxslt1-dev libssl-dev  
  
# pip install junos-eznc jxmlease
```


Setting Up Ansible 2.4 For Juniper

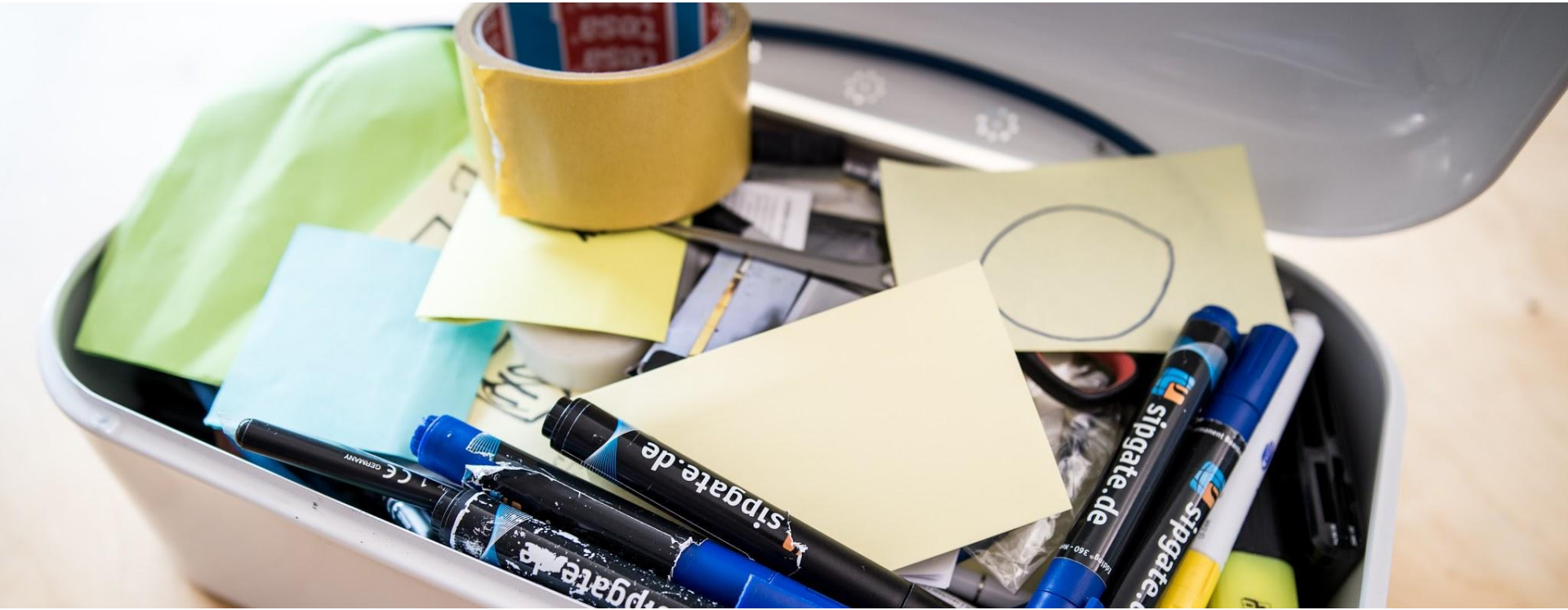
```
# apt install \  
python-pip python-dev libssl-dev  
  
# pip install pyopenssl ncclient
```

Setting Up Juniper For Ansible

```
set system services ssh
```

```
set system services netconf ssh
```

Things That Make Your Life Easier



Things That Make Your Life Easier

config style syntax

```
version 14.1X53-D40.8;
system {
    host-name test-switch;
    domain-name my.domain.net;
    time-zone Europe/Berlin;
}
[...]

interfaces {
    ge-0/0/0 {
        unit 0 {
            family inet {
                [...]
            }
        }
    }
}
```


Things That Make Your Life Easier

config style syntax

```
version 14.1X53-D40.8;
system {
    host-name test-switch;
    domain-name my.domain.net;
    time-zone Europe/Berlin;
}
[...]

interfaces {
    ge-0/0/0 {
        unit 0 {
            family inet {
                [...]
            }
        }
    }
}
```

set style syntax

```
set version 14.1X53-D40.8
set system host-name test-switch
set system domain-name my.domain.net
set system time-zone Europe/Berlin

[...]

set interfaces ge-0/0/0 unit 0 family...
```

Things That Make Your Life Easier

`junos_config:`

Set/Delete Statements vs. Config Syntax via Template

Things That Make Your Life Easier

switchsetup.yml:

- name: install dns configuration
 - junos_config:
 - lines:
 - set system name-server 192.168.0.1
 - set system host-name my-fancy-device
 - set system domain-name some.domain.here

Things That Make Your Life Easier

switchsetup.yml:

```
- name: install dns configuration
  junos_config:
    src: dns.conf
    src_format: text
```

dns.conf:

```
system {
  name-server {
    192.168.0.1;
  }
  host-name my-fancy-device;
  domain-name some.domain.here;
}
```

Things That Make Your Life Easier

switchsetup.yml:

```
- name: install dns configuration
  junos_config:
    src: dns.conf
    replace: yes
    src_format: text
```

dns.conf:

```
system {
  replace:
  name-server {
    192.168.0.1;
  }
  host-name my-fancy-device;
  domain-name some.domain.here;
}
```

Things That Make Your 2.4 Life Easier

switchsetup.yml:

```
- name: install dns configuration
  junos_config:
    src: dns.conf
    update: replace
    src_format: text
```

dns.conf:

```
system {
  replace:
  name-server {
    192.168.0.1;
  }
  host-name my-fancy-device;
  domain-name some.domain.here;
}
```


Things That Make Your Life Easier

Switchsetup.yml:

- name: generate dns configuration
 template:
 src: dns.j2
 dest: /tmp/junos_config_deploy/{{ inventory_hostname }}/dns.conf
 changed_when: false
- name: install dns configuration
 junos_config:
 src: /tmp/junos_config_deploy/{{ inventory_hostname }}/dns.conf
 update: replace
 src_format: text

Things That Make Your Life Easier

dns.j2:

```
system {  
    replace:  
    name-server {  
{% for ip in dns_ips %}  
        {{ ip }};  
{% endfor %}  
    }  
    host-name {{ inventory_hostname_short }};  
    domain-name some.domain.here;  
}
```

Things That Make Your Life Easier

Template/Config File Sizes

Complexity vs. Playbook Run Time



Things That Make Your Life Easier

Exception Handling in Ansible

How to deal with errors

Things That Make Your Life Easier

Switchsetup.yml:

- **block:**
 - [...]
 - template/junos_config Tasks
 - [...]
- rescue:**
 - debug: msg="configuring the switch failed. you can find the generated configs \ in /tmp/junos_config_deploy/{{ inventory_hostname }}/*.conf and try yourself"
 - debug: msg="scp the file to the switch and execute \ 'load replace <filename>' + 'commit' in conf mode"
 - fail: msg="stopping the playbook run"

Things That *Could* Make Your Life Easier

Things That *Could* Make Your Life Easier

Accidentally shipping old config revisions

Things That *Could* Make Your Life Easier

Accidentally shipping old config revisions

See a diff of what is about to change

Things That *Could* Make Your 2.4+ Life Easier

Tired of configuration statements?

Things That *Could* Make Your 2.4+ Life Easier

Tired of configuration statements?

`junos_interface, junos_13_interface, junos_vlan` etc.

More Information

<http://sipgate.engineering/>

Questions?



Image Sources

<https://www.juniper.net/>

<https://xkcd.com/303/>

<http://www.denog.de/meetings/denog9/>

All Other Images: sipgate GmbH