Practical Network Automation

Hands On

$ whoami

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Programmer:
Netmiko
NAPALM

Teach Python and Ansible
SF Network Automation Meetup

Step:

SSH into Lab Environment

git clone
https://github.com/lowescott/itx2017-net-auto-workshop

cd itx2017-net-auto-workshop
cd netmiko

Flickr: athomeinrome

Step:

Examples Using Netmiko Tools:

netmiko-grep --list-devices

netmiko-grep 'interface' cisco

netmiko-show --cmd 'show arp' juniper1

netmiko-cfg --cmd 'logging buffered 20000' arista_sw5

netmiko-cfg --infile logging_change.txt arista

See file ./netmiko/netmiko-grep-examples.md

Flickr: David Ohmer

What did I do behind the scenes?

git clone https://github.com/ktbyers/netmiko_tools

\# In your .bashrc file if you want to retain it
export PATH=~/netmiko_tools/netmiko_tools:$PATH

~/.netmiko.yml

netmiko-grep
netmiko-show
netmiko-cfg

What is the BMP?

Variables

Printing to stdout/Reading from stdin

Basic Data Types

Lists and Dictionaries

Conditionals

For Loops

Flickr: Jonathan Kriz

Python Resources

Python for Network Engineers Online Course
https://pynet.twb-tech.com/email-signup.html

Matt Harrison, Treading on Python Vol1: Foundations of Python
(AKA: Beginning Python Programming: Learn Python in 7 Days)
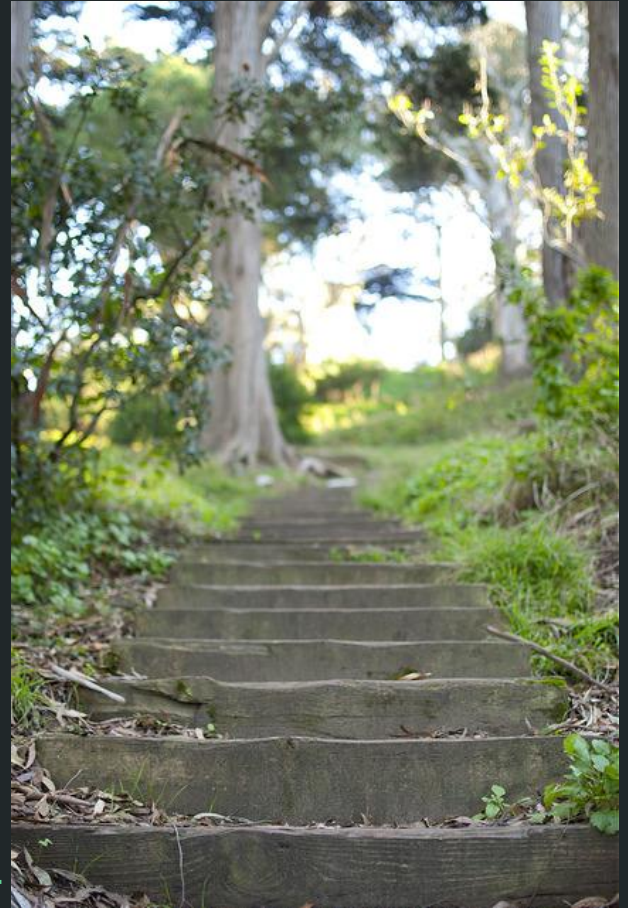https://www.amazon.com/Treading-Python-1-Foundations/dp/1475266413

Learn Python the Hard Way (with caveats)

Step:

Use Netmiko to connect to device.

Use Netmiko to retrieve 'show ip int brief' from a device.

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What is Netmiko?

Multi-vendor Python library designed to simplify interactions with Network devices.

Netmiko Methods
.send_command()
.send_command_timing()
.send_config_set()
.send_config_from_file()
.commit()

.enable()
.disconnect()
.write_channel()
.read_channel()

FileTransfer Class

1 Device, 2 Devices, N Devices

Expanding your program to deal with two devices; with N-devices.

Generalize the command

Saving the output to a file

Step:

Use Netmiko to retrieve 'show arp' from two devices, six devices.

Prompt for the command (as opposed to hard-coding to command to 'show arp')

Flickr: eblake

Git:

Why should network engineers care about Git?

git init
git add/rm
git commit

git status
git diff

git branch develop
git checkout develop

git vs GitHub

git push and git pull

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More on Git

Git Cheatsheet:

https://github.com/ktbyers/pynet-ons-mar17/tree/master/git

Git Tutorial:

https://try.github.io

But, but, but...

This is all legacy.

Where are my APIs? Where is all the glitter?

Flickr: Dan Markeye

NAPALM

Purpose of NAPALM: create a standard set of operations across a range of platforms.

Operations fall into two general categories: Config Operations + Getter Operations.

NAPALM Vendors

Arista EOS

Cisco IOS

Cisco IOS-XR

Cisco NX-OS

Fortinet Fortios

Juniper JunOS

Mikrotik RouterOS

Palo Alto NOS

Pluribus

Vyos

NAPALM Getters

get_facts

get_environment

get_snmp_information

get_ntp_peers

get_ntp_stats

get_mac_address_table

get_arp_table

get_interfaces

get_interfaces_ip

get_lldp_neighbors

get_lldp_neighbors_detail

get_bgp_neighbors

get_bgp_neighbors_detail

get_bgp_config

get_route_to

get_probes_config

get_probes_results

get_users

get_optics

NAPALM Config Operations

device.load_merge_candidate()
device.load_replace_candidate()

device.compare_config()
device.discard_config()

device.commit_config()

device.rollback()

Step:

Use NAPALM to push merge config.

Use NAPALM to push full configurations.

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