Beginner's Guide to NetDevOps with Cisco DevNet and Ansible
Q&A

Q: Will all Cisco platforms eventually support NETCONF/YANG and/or a common API?
A: (Ansible) One of our main focuses in 2018 is providing more opinionated ways to accomplish specific tasks for network operators. As we move in this direction, foundational development is needed to enable such things as NETCONF modules as well as YANG data modeling, parsing, and other activities as Ansible Roles. We are extremely excited to be taking on this endeavor, so stay tuned!

A: (Cisco) Cisco has embraced model drive programmability with NETCONF/RESTCONF and gRPC along with YANG data models across the networking portfolio. IOS XE, NX-OS and IOS XR all support NETCONF and YANG today, with standard 8040 RESTCONF support available on IOS XE 16.6+ today and coming for XR and NX. Additionally Cisco Network Service Orchestrator (NSO) supports these protocols today, and has for years. From a data model perspective, Cisco platforms support IETF and OpenConfig models as well as native models for platform specific features.

Q: Is there a public roadmap for the open source Ansible project?
A: (Ansible) YES! The next release is Ansible 2.6 and the roadmap has been posted, as well as the network planning wiki page.

Q: Is there an option for software management of IOS devices using Ansible? Specifically something addressing large switch stacks. But considering the different variables per device, if you need to make a change to 50 devices (like adding a new L3 interface), would you change 50 different text files?
A: (Ansible) The Cisco IOS, IOS XE, IOS XR, and NX-OS modules are written by Red Hat Ansible (Cisco ACI modules are written by Cisco). Ansible will be adding a network role (via github.com/ansible-network) that will help manage software and give additional scp abilities in a cross platform manner.

A: (Cisco) For characteristics that are nodes specific, you'll need a way to link the details to node. The use of host variables files is common and built into Ansible workflows making it a common choice. You could have a single variable file that held details from all devices, but your playbook would need a way to link the host -> variables written into it. Alternatively, you could pull host details from an external source by reading in via a REST API (as an example). This is more complicated, but does allow for a centralized data store.

Q: Are there any plans/roadmap for developing some modules for Cisco Multi-Site?
A: (Cisco) There are active plans to continue to add ACI Ansible modules that cover the full set of ACI capabilities. Specific dates and timeline for multi-site are TBD, but monitor the roadmap details from Ansible to see what is expected in different releases.

Q: Which versions of IOS is netconf available on? Is it recommended to use netconf over the standard SSH CLI for ansible modules?
A: (Cisco) NETCONF has been available on IOS XE since 16.x releases. For full details on support on Cisco platforms checkout https://developer.cisco.com/netconf

Q: In a vagrant environment can't we reduce the memory taken for NXOS9000V?
how can we have Vagrant, NXOS9000V, Virtualbox and Ansible in single Vagrant File ?
A: (Cisco) Nexus 9000v defaults to 8GB of RAM but can run on only 4GB. This can be updated in a Vagrantfile like any other VM setting. Example:
https://github.com/hpreston/vagrant_net_prog/blob/master/nx-os/basic/Vagrantfile . You can also create a single multi-node Vagrant file that included a Linux server along with the 9000v where you could run Ansible.

Q: Where can we find the playbooks being presented?
A: (Cisco) The IOS XE/NX-OS example is here:
https://github.com/hpreston/netdevops_demos/tree/master/ansible_02
The ACI one is here: https://github.com/hpreston/netdevops_demos/tree/master/ansible_aci01

Q: Can you explain on the LAB setup? What is the connectivity from control node to managed hosts? VIRL on MAC with 16GB Memory cannot simulate this LAB isn't it?
A: (Cisco) The backend of the example was running on a VIRL server provided by the DevNet Sandbox (Open NX-OS with Nexus 9Kv On VIRL). You can reserve an instance of this sandbox at no cost, and VPN into it to leverage it as the backend.

Q: What is the best method to learn Ansible focus in networking, your example use cases seem more advanced.
A: (Ansible) Cisco will make their playbooks available. We have also made a quick demo with open source VyOS that can run on your laptop... if you want to try that out and give me feedback I would appreciate it-> https://github.com/network-automation/linklight

A: (Cisco) DevNet has also created several Ansible + Networking Learning Labs that you can explore. https://learninglabs.cisco.com/modules?keywords=ansible

Q: Is there a graphical user interface (GUI) rather than pure CLI being demonstrated?
e.g. Build playbook in GUI; push Playbook via a GUI task?
A: (Ansible) This demo is focusing on open source Ansible. Although there is no graphical tool to build and create Playbooks, Red Hat Ansible Tower includes a GUI to assist in managing the running of playbooks once they are written.

Q: Can you roll back changes. e.g. run a playbook but customer complains network down? Can you revert back?
A: (Ansible) From an Ansible perspective there are many ways to do this, but we believe the most logical approach is to build "configuration" and "revert" Playbooks to run through Ansible.

Tower simplifies this by implementing a Workflow engine that allows you to automatically run the "revert" Playbook in the event of an error during a "configuration" Playbook.

Q: What are ways to provision Cisco devices initially? Cisco SmartInstall? Console connection? Via Ansible?
A: (Cisco) The recommended Day 0 setup technologies would be Zero Touch Provisioning (ZTP) for IOS XE and IOS XR, and POAP for Nexus (POAP is the NX-OS version of ZTP).

Q: Is it possible to automate network device licensing with Ansible?
A: (Cisco) You can use Ansible to copy license files to devices, and execute licensing commands. In this way, yes you could manage device licensing.

Q: Are there any learning labs on the basics of YAML on DevNet learning labs? It'll be extremely helpful for Network Engineers learning Ansible.
A: (Cisco) YAML is covered in several Learning Labs, but for a "YAML 101" you can checkout my (Hank) video on the basic data formats to understand.
https://developer.cisco.com/video/net-prog-basics/01-programming_fundamentals/data_formats

Q: Are there any Ansible modules available for Tufin?
A: (Ansible) Not that we know of! It might be a good idea to contact Tufin for their insight, as the majority of the vendor modules in Ansible are sponsored by the vendors themselves.

Q: I noticed you had console port info in inventory, Can ansible configure through terminal server console instead of ssh?
A: (Ansible) Although this method was used in the demo, Ansible does not recommend use with terminal servers.

A: (Cisco) Potentially. You would provide the IP and port for the terminal server connection to the console port as part of the inventory setup. Depending on how the terminal server responds to connection requests and how the console line is configured you may need to tweak settings.

Q: What is a "console server?"
A: (Ansible) It's also referred to as a terminal server, it connects to routers and switches over a serial connection, with a rollover cable. It is commonly used for managing network devices before you have SSH setup.

Q: If we build our own ansible module, how do you pass the info stored in the network_cli to it? IE username/password/enable
A: If you are Network Module Developer and want more information about getting network modules to work with network_cli, refer to the Ansible Network Developers Guide. Also, it's a great idea to ping folks on #ansible-network on the community IRC channel (freenode.irc.net).

Q: Is cisco going to release a IOS scp module so we can push code to devices?

A: (Ansible) The [Ansible 2.6 roadmap](#) was just released in the community, but this is part of the current plan (See: `network_get` and `network_push` modules).

Q: Would it be possible to add the virl topology file when sharing the playbooks to allow replication of the examples?
A: (Cisco) Yep, the VIRL file is included in the example repo, along with instructions in the README how to replicate the demo using a DevNet Sandbox.
https://github.com/hpreston/netdevops_demos/tree/master/ansible_02

Q: What is the editor Hank used on the right part of the screen?
A: Atom

Q: Do you recommend maintaining inventory in these text files? Or do you think it's better to use a DB like mongodb.
A: (Ansible) It depends on the organization and how they store data, but for production deployments Ansible recommends using a backend database if possible. Many network groups already have an inventory, like Infoblox. We have added dynamic inventory ability with Infoblox so you can grab your inventory straight from Infoblox. We have also seen customers keep a separate GitHub repo for just inventory. It depends on what tools you are currently using, and the scale of the organization.

Q: We're not that large in terms of devices. But fact of the matter is we have a lot of products that have parts of the inventory today. No single source. We're trying to figure out how to move to Ansible but also develop a gui and a set of mongodb collections to interface with ansible. Do you have any pointers for using mongodb with ansible?
A: (Ansible) It is possible to use with Ansible something called dynamic inventory, where we can populate the Ansible inventory from an external source. For dynamic inventory documentation please refer to: http://docs.ansible.com/ansible/latest/user_guide/intro_dynamic_inventory.html

There is a full list of all the dynamic inventory integrations in the GitHub repo:
https://github.com/ansible/ansible/tree/devel/contrib/inventory
But mongodb is not one included in the Ansible project at this time. A quick Google search reveals several community projects around Ansible dynamic inventory with mongodb.

Q: Where does `ansible_network_os` var comes from?
A: (Ansible) You (the user) provide it to your playbook, most commonly through your inventory, possible values are vyos, nxos, ios, iosxr, junos, eos, since these are the platforms that support the [network_cli connection plugin](#) today.

Q: Have you got documentation about dynamic inventory with Infoblox? We do have infoblox and ton of network devices around the world.
A: (Ansible) Check out the following blog post:
https://www.ansible.com/blog/infoblox-integration-in-ansible-2.5

Q: How does ansible scale? I mean for a large amount of devices, say 10,000+?

A: (Ansible) There are numerous Ansible customers that are automating greater than 10,000+ network nodes in their environment. Ansible Tower is ideal to help operationalize automation in enterprises many people people automating network devices in multiple data centers globally. Please refer to the video Sam Doran created at Ansiblefest London:
https://www.youtube.com/watch?v=7gEKmsuJr7s

Q: What would your recommendations be on organizing your git repo look like?

A: (Ansible) Good question... We will have more perscriptive guides on organizing soon (from both Cisco DevNet and Ansible) but something you should read is Ansible best practices, and how Ansible can be scaled out:

https://docs.ansible.com/ansible/latest/user_guide/playbooks_best_practices.html#content-organization

Q: How can I find out more about how to use Ansible to manage my network infrastructure

A: http://docs.ansible.com/ansible/latest/network