Traditional Network Management

- The traditional way to manage network devices is one at a time using SSH to the command line.
- Copying and pasting from a text file template is common.
- GUI tools to manage one device at a time have also been available for a long time but they have typically been slow and inefficient.

NMS Network Management Systems

- NMS systems such as SolarWinds, CiscoWorks and Cisco Prime Infrastructure have also been available for a long time.
- They use protocols such as SNMP and NetFlow to gather information and report on the state of the network.
- SNMP was originally proposed in 1988.
- SNMP can also be used to push configuration to devices but it has limited functionality.
- The solutions can be complex to implement and operate.
- SNMP also has security concerns.

The Issues with Traditional Network Management

- Configuring one device at a time is time consuming and inefficient.
- It increases the likelihood of typos and other mistakes.
- Individual edits to multiple devices by separate engineers over time with little version control leads to configuration drift (non standardized configurations).
- Having non standardized configurations and accessing one device at a time is also inefficient for troubleshooting.

Network Automation

Automation can be used for:

- Device configuration
- Initial device provisioning
- Software version control
- Collecting statistics from devices
- Compliance verification
- Reports
- Troubleshooting

Network Automation Benefits

- Network programmability enables automation which reduces human to machine interaction.
- This greatly reduces the chance of human error such as typos.
- Modern tools have been built with monitoring, configuration and troubleshooting in mind.
- It is much more scalable than configuring one device at a time.
- Network programmability can provide configuration version control.
- It can also provide software version control.

Network Automation Benefits

- Troubleshooting is more efficient with a system wide view and correlation between events.
- Events and error codes can be acted on programmatically.
- Improving configuration and troubleshooting efficiency reduces operational expenses (OPEX).

Network Automation Benefits - Assurance

- Assurance can:
- Ensure devices have a standardized configuration
- Provide reports on and correct any exceptions
- Provide correlation between events on different devices
- Automatically take corrective action on events and error codes

Which Automation Method to Use

- There are multiple methods that can be used to automate network management – Python scripts, NETCONF, RESTCONF, Ansible, Puppet, SDN, Cisco DNA Center etc.
- Not all methods are supported by all devices
- You should choose the method(s) which is most suitable for your environment and skills