**Ansible**

[**https://docs.ansible.com/ansible/latest/index.html**](https://docs.ansible.com/ansible/latest/index.html)

**1) Ansible** is used for continuous deployments achieving zero downtime rolling updates.

Ansible is aagentless and push-based configuration management tool; it means we can push configuration onto the node machine directly without having any central node.

It communicates with remote machines over SSH.

**Ansible is developed and written in Python. It’s an open source, agent less, push based configuration management and application deployment tool without any downtime. It has controlling node connects through JSON connection and login to number of managed nodes over SSH protocol and deploys one/more application by executing a single ansible command. Ansible is used for software provisioning, configuration management, infrastructure deployment and application deployment.**

**In case of executing multiple commands/tasks, we use Ansible playbooks which are written in YAML format**.

**2) Why Ansible**

There are many automation tools like Chef, Puppet, Salt and CFEngine however, Ansible is suited for Network Automation for the following reasons:

* Ansible does not require an agent to be installed in the Managed Node (Network Device)
* Ansible requires Python on the Managed Node and most Network Devices support Python

**3) Control Node:** Ansible installed machine is called Control Node. We cannot use a Windows machine as a control node. You can have multiple control nodes.

The Network infrastructure is managed from these Controlling Nodes. In an Enterprise environment, Controlling Nodes are typically Linux bastion servers.

**4) Managed Nodes/hosts**: The network devices (and/or servers) you manage with Ansible. Ansible is not installed on managed nodes.

Managed Nodes are the Network Devices that is being managed by the Controlling Nodes. Managed Nodes are typically of Cisco, Juniper, and Arista make and can be classified as Switches, Routers, Firewalls and Load Balancers based on their function from a Network Engineer’s perspective.

**5) Inventory:** list/group of hosts which are managed by ansible. Also called Target servers/systems.

Inventory hosts file default location is /etc/ansible/hosts.

The inventory file can be in one of many formats, depending on the inventory plugins you have. It can be INI-like format.

We can create our own hosts file in any location and supply it in ansible commands as below:

~]# ansible –inventory PATHNAME (or)

~]# ansible -i PATHNAME

**6) Tasks:** Units of action in Ansible. Tasks calls module to perform the action/task.

**7) Modules:**Code/Programs that perform actual work of the tasks. Modules are invoked by tasks to perform the tasks. 500+ core modules are available.

Example: copy content from one directory to other.

Here copy is the action/task and commands used to perfrom this action is provided in the module.

**Ansible Installation**

**On Master or Control Node execute below steps: Ubuntu VM for control node and static ip**

**Step 1**: (C & M): Install updates as root user: # apt update # apt upgrade -y

**Step 2**: (C & M): Create a new user for ansible administration & grant sudo access to user:

# useradd -m ansadmin

# id ansadmin = gives output as uid, gid, group and also a folder gets created in home directory

# passwd ansadmin

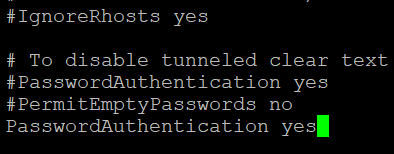
Add ansadmin to sudoers file: **# visudo** at the end of the sudoers file add: ansadmin ALL=(ALL) ALL

**Step 3:** (C & M): Setup Password based authentication:

go to the sshd\_config file and change PasswordAuthentication to yes which allows login with ansadmin:

# cd /etc/ssh/ # sudo vi sshd\_config

remove # from "PasswordAuthentication yes" which enables Password based Authentication.

Then reload sshd: # sudo service sshd reload then # apt upgrade

**Step 4:** (Controlnode Only) Install Ansible: Login as ansadmin user to install Ansible. In RHEL 8, Ansible must be installed with ansadmin user or ansible user whatever we created and cannot be installed using root user as it will not work as expected. In Ubuntu, we can install with root user also:

*# apt-add-repository ppa:ansible/ansible # apt update*

# apt search ansible # apt show ansible # apt install ansible # ansible --version

**Step 5**: Login as ansadmin: Create ssh keys to enable Password Less authentication between Ansible Control system to Managed hosts: **# ssh-keygen** which will generate public and private keys key\_rsa and key\_rsa.pub in .ssh folder. Copy keys onto all Ansible managed nodes: **# ssh-copy-id <private ip of managed node>**

To get ip address of managed node, login to managed node and type ifconfig.

**Step 6:** Now try to connect/ssh managed host and it should connect without asking password as we have enabled Password Less Authentication: **# ssh <private ip of managed node>** then **# exit**

**Step 7:** On master node, go to hosts file and update it with managed nodes ip addresses:

# vi /etc/ansible/hosts and remove everything in this file, just add private ip of managed node.

**Step 8:** **Testing:** We have set up Ansible Control and Managed nodes. Now perform testing, we should be able to deploy configuration from Control node to managed nodes:

a) Ping testing:

# ansible all -m ping

b) copy a file from control to managed: create a file at /home/ansadmin folder of control node:

# cd /home/ansadmin # vi test.txt "Hello Ansible"

Let's try to copy this on managed node using Ansible command:

# ansible all -m copy -a "src=/home/ansadmin/test.txt dest=/home/ansadmin/"

Now login to managed node and check for the test.txt file in /home/ansadmin path.