

Survey on Ansible

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ABSTRACT

Ansible is a tool used for automating your application and IT infrastructure. In an organization it has a very large infrastructure and a small team to configure the infrastructure and do the same job repeatedly as manual work could result in errors. Ansible is a tool to configure all the infrastructure which is written in an easily understandable YAML ain't markup language (YAML). Ansible is used to automate the work which is done repeatedly and configure all the infrastructure without any errors.

Keyword: *YAML, SSH, Playbook, Inventory, Ansible.*

1. INTRODUCTION

Ansible is an open source tool for application deployment and configuration management for the infrastructure of the organization. Ansible helps the system administrator to configure the infrastructure very quickly just by running the script in the local machine. The time taken to configure one system using ansible can configure all the systems at a time. The time taken to one system can configure all the systems. Ansible helps system administrator to do his job quickly and focus on other jobs. The system administrator has some time to think on other jobs and to do some other productive work. Ansible is installed in the local machine and nothing is installed in client side with this ansible is agentless. In the local machine it contains modules and inventory. Module contains playbooks in which the instructions are written what should be done in client machine. Inventory contains the details of the client machines in which the instructions are executed. The playbook is written in easily understandable YAML language. The local machine is communicated with client machines use the secure shell. The ssh-key of local machine is added to every client machine and the internet protocol address of every client machine is added to inventory in local machine

2. LITERATURE SURVEY

In this paper, Ansible is different from another available configuration tool. Ansible uses simple English configuration to write the playbook which makes this easy to set up. Ansible need to be installed in local machine from where the infrastructure is managed. In client machine no other plugins and dependencies need not to be installed. [1]

One of the Proposed papers suggests that playbook can consists more than one plays. Consider one playbook has two plays, each to configure in multitier application. Idempotence is the important characteristic of ansible. One playbook can be executed for multiple number of time the output results the same every time. [2]

Ansible is the tool in DevOps environment to manage the infrastructure. Ansible tool comes on operations side of the DevOps. The system administrator is responsible for maintaining the company's infrastructure of all the different servers [4]. There can be web servers running apache and database server running MySQL. If there are a smaller number of web servers and database servers, it is easy to maintain. If there might have chance the servers may increase it is difficult to maintain [5].

The system administrator must do the same task multiple number of times for all the servers. This may lead to errors doing the same task multiple tasks. This is where the Ansible comes into picture. Ansible is a tool is used to

automate the IT infrastructure. This helps the system administrator to configure the infrastructure easily and may work on other productive tasks and concentrate on other tasks [3].

3. ARCHITECTURE OF ANSIBLE

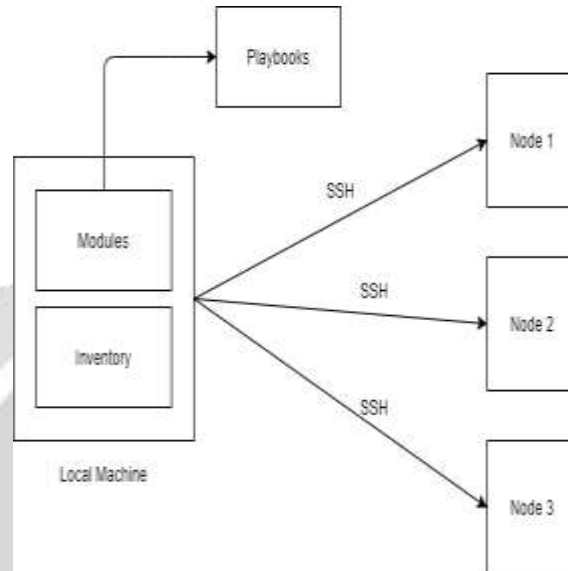


Fig -1: Architecture diagram of Ansible

Ansible is a push type configuration management tool. Ansible is installed in local machine and nothing is installed in client machine. The local machine contains all the instruction which need to be pushed to client machine to execute the instruction. Client machines are the systems to be configured and they are controlled by the local machine.

Module is a collection of configuration code files. These configuration files are called playbooks. Inventory is a document that group the nodes under specific labels. The local machine connects to the client machine through an SSH client. The core of Ansible is its playbook. Playbooks are the instructions to configure the nodes. They are written in YAML.

- **YAML**

The full form of YAML is YAML ain't markup language. The purpose of a markup language is to define the structure of a document. YAML is a very simple annotation format that can be used to store data

- **Secure Shell**

Secure Shell works as client server model to allow authentication between two systems. Secure Shell is a software to transfer encrypted data transfer between two systems.

- **Playbook**

Playbooks are instructions to configure the nodes. They are written in YAML. In playbook instructions and tasks are written which must be executed in client side. The execution of same play book multiple times the output will be same without any errors.

- **Inventory**

Inventory is used to maintain the structure of the network environment. Inventory file classifies nodes into groups. In the inventory file the nodes related data will be present. The internet protocol addresses of nodes will be present. Based on the data in inventory file the playbooks are executed in order or to decide which playbook must be executed in which node.

4. IMPLEMENTATION

The working of ansible understand with an example of creating a directory, copying the file content which is in local machine to client machine and installing a software and hosting a website in client machine from local machine. Ansible is installed in local machine and no other plugins and dependencies is installed in client machine. This makes the ansible agentless.

```

ansible --version
ansible 2.9.1
config file = /etc/ansible/ansible.cfg
configured module search path = ['/root/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
ansible python module location = /usr/lib/python3.7/site-packages/ansible
executable location = /usr/bin/ansible
python version = 3.7.1 (default, Nov 5 2019, 14:07:04) [GCC 8.2.1 20190111 (Red Hat 8.2.1-4)]

```

Fig -2: Ansible is installed in local machine

The Fig-1 shows the ansible is installed in local machine where the playbooks are written, and execution of playbooks done and where the inventory file maintained.

```

- name: sample3 book
  hosts: [ansible_clients]
  remote_user: root
  become: true

  tasks:
    - name: create directory
      file:
        path: /opt/kau
        owner: root
        state: directory
        mode: '0777'

    - name: copy from server to remote
      copy:
        src: /root/Kaushik/remotefile
        dest: /opt/file1

    - name: list files in folder
      command: ls

    - name: install httpd
      yum:
        name: httpd
        state: latest

    - name: run httpd
      service:
        name: httpd
        state: started

    - name: create content
      copy:
        content: "Welcome"
        dest: /opt/index.html

```

Fig -3: Playbook Which is executed in client machines

Fig-2 shows the playbook with the instructions for creating a directory, copying contents from one file to another file and installing a software and hosting a website.

The playbooks are simple and easily understandable. The playbooks are idempotent where playbooks are executed multiple times the result will be same without any error.

```

[directory]
10.18.56.7
10.56.3.45
[copy contents]
10.56.89.23
[host website]
10.4.6.98

```

Fig -4: Inventory file consists of IP address of client machines

The Fig-3 shows the inventory file contains the IP address of the client machine. In which client machine which instructions must be executed can be specified using the inventory file. In the first two IP address directory is created; the third IP address copy the file contents from local machine to client machine.



```

ansible-playbook main.yml --syntax-check
playbook: main.yml

```

Fig -5: Checking the syntax of the playbook

Fig-4 explains to check the syntax of the playbook with the command. The command is executed to check the playbook syntax is correct without any error.



```

[...]
```

Fig -6: Execution of playbook in the local machine

Fig-5 explains the execution of playbook using the command. The playbook executed depending on the inventory file.

The ansible is automatic reporting after executing the playbook the output is reported whether the configuration in playbook is successfully executed in client machine. The automatic reporting helps to see how many are successful or any of them failed.

5. CONCLUTIONS

Ansible helps the system administrator of the organization for automate the organization infrastructure. The system administrator to configure more systems have to same task multiple times, manual work may lead to error some time. Ansible helps the system administrator to automate the configuration of the infrastructure of organization. Ansible helps the system administrator to make his work more efficient. The instructions written in the playbook executes multiple times result in the same output without any errors. The time taken to configure the one system the same will take for the configuration of more systems at a time.

6. REFERENCES

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