DevOps Tools

Day - 11

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Agenda

● Server Configuration & Ansible

● Ansible Inventory

● Hands-On Demonstration

Server Configuration & Ansible

Sensitivity: Internal & Restricted

Server Configuration for DevOps

Ansible for Server Configuration

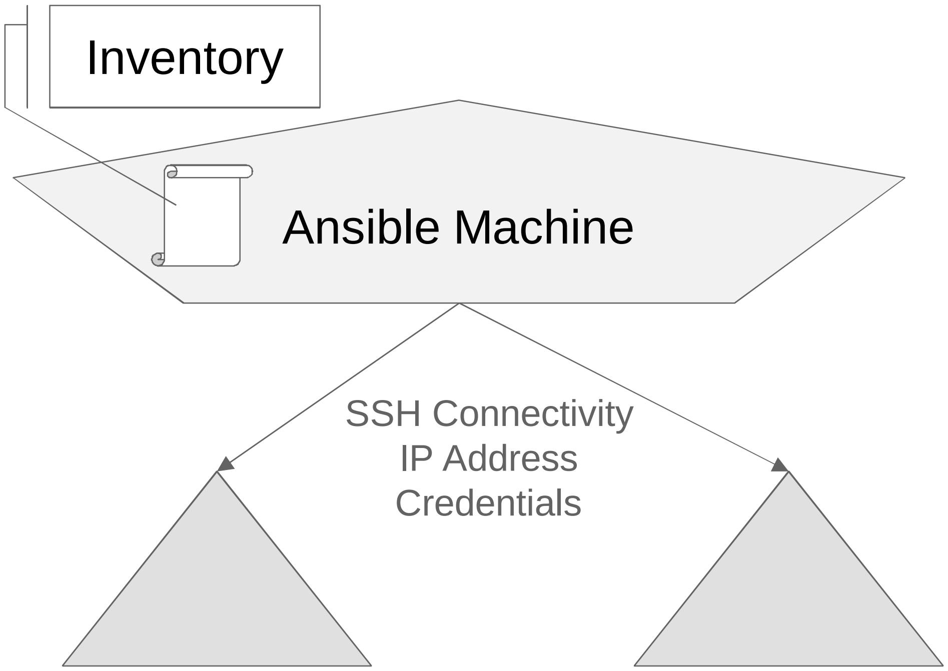
- Preparing the server for application deployment with required environment
- Environment or “Desired State” may include required packages, services, configuration files etc
- Ansible automates the configuration management by allowing the “Desired State” to be achieved through script
- Training here covers Ansible Playbook written in YAML file format

Ansible

Ansible Official Sites for reference.

- Ansible Official Site: https://www.ansible.com/
- Ansible Documentation: http://docs.ansible.com/
- Ansible Playbooks : https://galaxy.ansible.com/
- All Information in this presentation slides are taken mostly from one of these sites.

Ansible Architecture



Inventory

Ansible Machine

SSH Connectivity
IP Address
Credentials

Production Servers to be configured

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Ansible – As a DevOps Tool

- A configuration management tool. Helps you automate your dev-ops, system / operations administration tasks.
- Primarily uses a simple DSL and YAML data files
- Uses python as a default languages for modules / extensions
- Uses a push based model by default, though a pull based model also supported

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Ansible Features

- Clear - Ansible uses a simple syntax (YAML) and is easy for anyone (developers, sysadmins, managers) to understand. APIs are simple and sensible.
- Fast – Since agent/client installation is not required setting up the cluster will be faster.
- Complete - Ansible does three things in one, and does them very well. Ansible’s ‘batteries included’ approach means you have everything you need in one complete package.
- Efficient – Due to absence of agent or any other software, applications can have more space. As Ansible modules work based on JSON, it is easier to add or customize the modules written in known programming languages.
- Secure - Ansible uses SSH, and requires no extra open ports or potentially vulnerable daemons on your servers.

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Comparing with Puppet

- Provides extensive reporting capabilities
- Modules have gone several changes and not much extensible
- Only enterprise version has web interface
- Uses just server and client architecture and simpler compared to chef
- Slow in performance

- Reporting capability available through Ansible Tower
- Extensive set of modules written in Python. Relatively more stable.
- Web User interface available through Ansible Tower
- Much simpler architecture with just one machine from where Ansible control infrastructure.
- Relatively faster

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Comparing with Chef

- Recipes are based on extensive Ruby syntax which takes longer time to learn.
- Provides a standard web interface and is free
- More complex architecture with Workstation, Server and Clients
- Chef Supermarket provides large library of recipes and cookbooks
- Easy to work across platforms and easy installation procedure
- Provide fast performance

- Modules implemented using Python, which is more popular among developers and simple.
- Ansible tower comes with extra cost
- Relatively simpler architecture with Ansible machine comparable to Chef workstation with no need of separate server and client
- Extensive library of existing playbooks through Ansible Galaxy
- Simpler installation generally available only for Linux platform.
- Faster performance.

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Ansible Features

- Ansible is based on Python
- Compared to Chef and Puppet, Ansible is more recent with a growing community
- Ansible needs no agent, but require Python on target machines.
- Ansible architecture is much simpler with no server or agent.
- Web user interface available, through Ansible Tower.

Ansible Inventory

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Ansible Inventory

- Common file where all Target machines to be configured by Ansible are listed
- File has details of IP Address, User name, Password or Key to access target machine
- Each target machine listed in Ansible Inventory can be referred with a name to the machine
- Target machines can also be grouped under a common name
- Ansible playbooks/roles can be directed to either individual machines or to a group of machines, by specifying the name as specified in the inventory file

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Ansible Inventory

- Centralized inventory file available in the path /etc/ansible/hosts
- Identified by centralized configuration file in the path /etc/ansible/ansible.cfg
- Inventory file can also be created locally in a folder and can be pointed by ansible.cfg file created locally

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Ansible Inventory

- To Create Group

```
[local]
[webservers]
[ldbservers]
```

- To add a the Ansible Machine itself as localhost (SSH Not required)

```
[local]
localhost ansible_connection=local
```

- To add a simple server information

```
[client]
centclient01 hostname=192.168.56.102
```

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Ansible Inventory

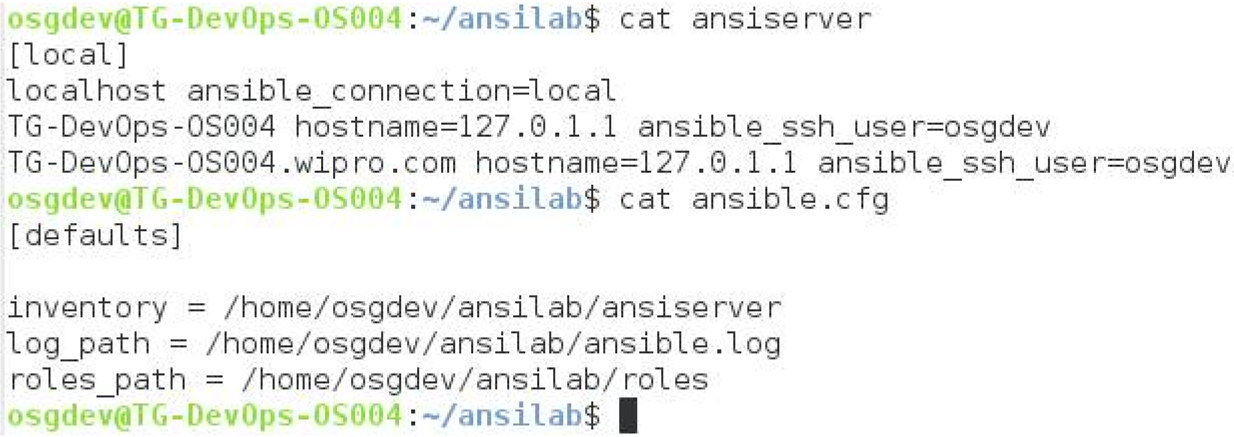
- To add server with IP and Username

```
[client]
centclient01 hostname=192.168.56.102 ansible_ssh_user=root
```

- To add cloud server with IP, Username and Key

```
[webserver]
web hostname=<IP address> ansible_ssh_user=vagrant
ansible_ssh_private_key_file=path/to/private_key
```

Sample Inventory File & Configuration File



```
osgdev@TG-DevOps-OS004:~/ansilab$ cat ansiserver
[local]
localhost ansible_connection=local
TG-DevOps-OS004 hostname=127.0.1.1 ansible_ssh_user=osgdev
TG-DevOps-OS004.wipro.com hostname=127.0.1.1 ansible_ssh_user=osgdev
osgdev@TG-DevOps-OS004:~/ansilab$ cat ansible.cfg
[defaults]

inventory = /home/osgdev/ansilab/ansiserver
log_path = /home/osgdev/ansilab/ansible.log
roles_path = /home/osgdev/ansilab/roles
osgdev@TG-DevOps-OS004:~/ansilab$ 
```

Hands-On Demonstration

Handson Demonstration

Check Ansible Availability

- Check for Ansible Version

```
osgdev@TG-DevOps-OS004:~$ ansible --version
```

- Check Ansible Global Configuration File

```
osgdev@TG-DevOps-OS004:~$ vi /etc/ansible/ansible.
```

- Check Ansible Global Inventory File

```
osgdev@TG-DevOps-OS004:~$ vi /etc/ansible/
```

Handson Demonstration

Pushing “ping” Module

- Pushing ping module to local machine

```
$ ansible all -i 'localhost,' -m ping -c local
```

- Specifying server in inventory file

```
[local]
localhost
```

```
$ ansible all -i '/home/osgdev/ansilab/ansiserver' -m ping -c local
```

- Specifying group and server name in ansible command

```
$ ansible local -i '/home/osgdev/ansilab/ansiserver' -m ping -c local
```

```
$ ansible localhost -i '/home/osgdev/ansilab/ansiserver' -m ping -c local
```

Handson Demonstration

Inventory File and local connection

- Specifying inventory file path in configuration file

```
[defaults]

inventory = /home/osgdev/ansilab/ansiserver


$ ansible localhost -m ping -c local
```

- Specifying local connection type in inventory file

```
[local]
localhost ansible_connection=local

$ ansible localhost -m ping
```

Handson Demonstration

Adding another server

- Another name for the same local server

```
[local]
localhost ansible_connection=local
TG-DevOps-OS004 hostname=127.0.1.1 ansible_ssh_user=osgdev
```

- Check connectivity using this second name to local server

```
$ ping TG-DevOps-OS004
$ ssh osgdev@TG-DevOps-OS004
```

- Pushing ping module with credentials

```
$ ansible TG-DevOps-OS004 -m ping -k -u osgdev
```

Handson Demonstration

Keypair for connectivity

- Generate keypair

```
$ ssh-keygen
```

- Push the key

```
$ ssh-copy-id -i ~/.ssh/id_rsa.pub TG-DevOps-OS004
```

- Check for password less access

```
$ ssh osgdev@TG-DevOps-OS004
```

- Push the ping module

```
$ ansible TG-DevOps-OS004 -m ping
$ ansible local -m ping
$ ansible all -m ping
```

Handson Demonstration

Try with FQDN

- Inventory File Entry

```
[local]
localhost ansible_connection=local
TG-DevOps-OS004 hostname=127.0.1.1 ansible_ssh_user=osgdev
TG-DevOps-OS004.wipro.com hostname=127.0.1.1 ansible_ssh_user=osgdev
```

- Pushing ping module with credentials

```
$ ssh osgdev@TG-DevOps-OS004.wipro.com
$ ansible TG-DevOps-OS004.wipro.com -m ping -k -u osgdev
```

- Pushing ping module with keypair

```
$ ansible TG-DevOps-OS004.wipro.com -m ping
$ ansible all -m ping
```

Handson Demonstration

Listing Hosts

- Inventory File Entry

```
[local]
localhost ansible_connection=local
TG-DevOps-OS004 hostname=127.0.1.1 ansible_ssh_user=osgdev
TG-DevOps-OS004.wipro.com hostname=127.0.1.1 ansible_ssh_user=osgdev
```

- Listing all hosts

```
$ ansible --list-hosts all
```

- Listing hosts by group

```
$ ansible --list-hosts local
```

- Listing hosts by server name

```
$ ansible --list-hosts localhost
```

Sensitivity: Internal & Restricted

Thank You