

MODULE 1: ANSIBLE AUTOMATION AND CONFIGURATION MANAGEMENT

Poll Question

What role does automation play in your company's current infrastructure management?

- A. None
- B. We automate some things
- C. We automate everything
- D. I don't know



Module Overview

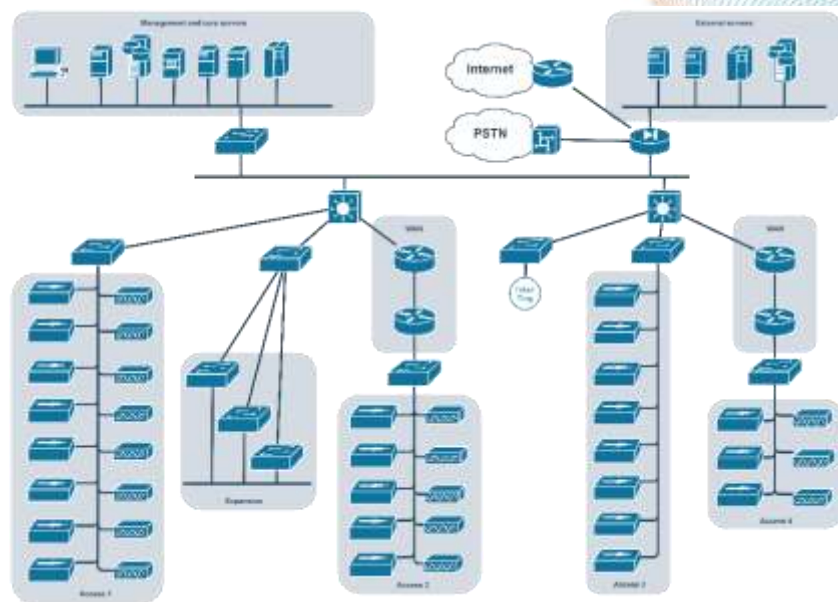
- Automation and Configuration Management
- Automation Solutions
- Ansible
- Knowledge Check

AUTOMATION AND CONFIGURATION MANAGEMENT



Automation and Configuration Management

- Sysadmins and SREs responsible for growing inventories
- Installation, configuration, updates & patching
- Even provisioning!
- The days of manual management are long gone.



Sysadmin core tasks

Configuration Management

- Installing, updating, patching software
- Network configuration

Resource Provisioning

- Servers, network components, databases
- Kubernetes clusters

Ad Hoc Task Execution

- Reboot servers
- Copy Files

Automation = Removing Toil

- In the Google SRE handbook “Toil” is defined as:

“... the kind of work tied to running a production service that tends to be manual, repetitive, automatable, tactical, devoid of enduring value and that scales linearly as a service grows”

- The purpose of automation is to remove toil from the life of a Sysadmin
- This means different things in different situations:
 - Sometimes automatically running something based on metrics monitoring (no human intervention)
 - In other cases it can be putting a push-button tool that achieves a task no matter what the scale of your service is.

AUTOMATION SOLUTIONS



Configuration Management Solutions

- A very large field!
- One of the earliest (still current) was [CFEngine](#)
 - Mark Burgess, 1993
 - A system for managing Unix servers to minimize toil
 - Pioneered the concept of a declarative (or *convergent*) system
 - Evolved into a sophisticated, cross-platform tool
- [Chef](#) is a Ruby based configuration management tool.
- [Puppet](#) also provides a full set of automation tools using its own declarative language.
- [Salt](#) is a Python-based tool for event-driven IT automation, remote task execution and configuration management.



Resource Provisioning Solutions (IaC)

- The big player here is [Terraform](#) from HashiCorp
 - Fully featured declarative IaC solution
 - Providers for all major cloud platforms and many others.
- Many cloud providers have their own IaC solutions
 - CloudFormation (AWS)
 - Resource Templates (Azure)
 - Deployment Manager (GCP)



Ad Hoc Task Execution

- Many tools allow execution of arbitrary shell commands
- A good example is plain old ssh:

```
> ssh my.ssh.node.com cat /etc/passwd
```

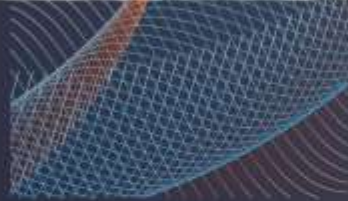
So Why Ansible?

- Ansible seeks to be a single, simple, consistent tool for all three Sysadmin task areas
 - Configuration Management
 - Resource Provisioning
 - Ad Hoc Task Execution
- Ansible aims to be
 - **Clear:** Simple YAML syntax
 - **Fast:** Fast to learn, fast to set up
 - **Complete:** You have everything you need in one package
 - **Efficient:** No extra software or services running. Also easily extensible
 - **Secure:** All comms are via SSH.

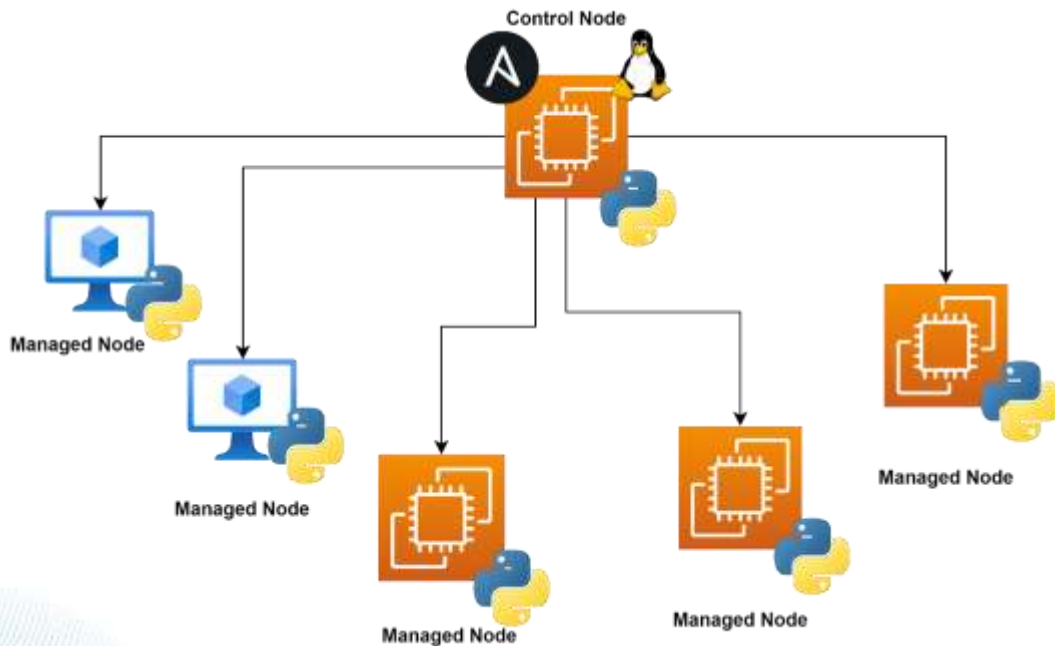


ANSIBLE

ANSIBLE



Ansible Architecture



- Control node must be Linux
- Control node must have SSH
- All nodes must have Python and pip installed
- Managed nodes must be SSH accessible

Ansible Key Features

- Agentless
 - You need to have Python and pip installed on your managed nodes, nothing else.
 - It doesn't have any background services running
- Secure
 - By default uses OpenSSH for transport
- Simple and easy to use
 - Uses human readable language (YAML, JSON)
- Extensible
 - You can write your own modules in any language that can return JSON
- Excellent Documentation
 - <https://docs.ansible.com>

Ansible Flavours



Community Ansible



Red Hat Ansible Automation Platform

REVIEW



Module Review

In this module you learned about:

- ✓ Automation and Configuration Management
- ✓ Automation Solutions
- ✓ Ansible

Next we will do a short quiz

- Knowledge Check

KNOWLEDGE CHECK





Knowledge check question 1

Patching software is an example of which Sysadmin task type?

Choice	Response
A	Configuration Management
B	Resource Provisioning
C	Ad Hoc Task Execution

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Knowledge check question 2

What syntax is used for Ansible files?

Choice	Response
A	HCL
B	XML
C	YAML
D	JS

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Knowledge check question 3

A Windows server is fine for an Ansible managed node?

Choice	Response
A	True
B	False

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