**OSYS 3030**

**Ansible Configuration Management**

**Demonstrated Skills:**

* *VMware OS creation/management*
* *Installation activity planning*
* *Ansible controller creation*
* *Working with Ansible:*

*- Host file configuration*

*- Ad-Hoc commands*

*- Playbook creation/configuration*

**OSYS 3030**

**Ansible Configuration Management**

**Jeff Guitard**

**Dec 2, 2022**

Contents

[Task 1: Proof-of-concept 4](#_Toc130824858)

[Target Host VM Activity Plan 4](#_Toc130824859)

[Ansible Controller VM Activity Plan 6](#_Toc130824860)

[Task 2: Executive Summary 8](#_Toc130824861)

[Ansible hosts converted to text 9](#_Toc130824862)

[Useful Ad-Hoc commands 11](#_Toc130824863)

[Change Log 12](#_Toc130824864)

[Playbook.yaml 12](#_Toc130824865)

[References 15](#_Toc130824866)

# Task 1: Proof-of-concept

## Target Host VM Activity Plan

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Activity List/Plan** | | | | | |
| **Project: OSYS3030 – Ansible Target Host** | | | | | **Date: 12/02/2022** |
| **Activity ID No.** | **Activity Name** | **Description of Work** | | | **Responsibility** |
| A001 | Documentation required for install and configuration. | [(Updated v2) Naming Convention v1.9.22 - OSYS3030/4200/Network Services Using Linux(B)/Smith,Mike (brightspace.com)](https://nscconline.brightspace.com/d2l/le/content/245808/viewContent/3502833/View) | | | Jeff Guitard |
| A002 | Resources required for install. | CentOS-7-x86\_64-DVD-2009.iso | | | Jeff Guitard |
| A003 | Documentation of object names required for implementation. | **Specify object names in preparation for implementation** | | | Jeff Guitard |
| **VM** Folder: | F:\OSYS3030\OSYS3030-LX05 | |
| **VM** Name: | OSYS3030-LX05 | |
| **VM** OS (selected during VM build): | CentOS 7 64-bit | |
| **System** Hardware Configuration: | Primary HD | 40GB |
| Additional HDs | 10GB |
| RAM | 4GB |
| Processors/Cores | 1 processors/ 1 core |
| Network | IP Address (Static) | 192.168.208.88 |
| Subnet Mask | 255.255.255.0 |
| G/W Address | 192.168.208.2 |
| DNS Server Address | 8.8.8.8 |
| Installation Mode | New Install | |
| Time Zone: | Halifax am/pm | |
| OS Type | CentOS Server | |
| “Administrator” Password: | password | |
| Host Name: | lx05.osys3030.local | |
| Domain Name: | osys3030.local | |
| **Backup** Admin User: | badmin | |
| Password: | bkpassword | |
| DSRM Password: |  | |
|  | | |
| *Name and description of each snapshot to be taken during install.*  *Create a schedule of regular rollback points of the server and take regular snapshots of your server in shutdown state.* |  | |
| A004 | Required configurations or settings applied | **\*Assign root password**  **\*Install Software Selections**  *Base Environment = Server with GUI*  **Software Selection Add-On List:**  *Backup server*  *File and Storage Server*  *Hardware monitoring utilities*  *High availability*  *Print server*  *Remote management for Linux*  \*CentOS Server Disks  **Partition (40GB disk)**  *5g = Boot*  *5g = Swap*  *20g = Root*  *10g = Home*  **Partition (10gb disk) = Leave as-is**  *\*****Create backup admin account***  ***\*Apply updates*** | | | Jeff Guitard |
| A005 | Additional Software required. |  | | | Jeff Guitard |
| A006 | “Snapshot” information: | Snapshot with description is to be taken after installation and after changes. | | | Jeff Guitard |
| A007 | “Gold” Copy information: | F:\OSYS3030\OSYS3030-LX05-GC | | | Jeff Guitard |

## Ansible Controller VM Activity Plan

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Activity List/Plan** | | | | | |
| **Project: OSYS3030 – Ansible Controller** | | | | | **Date: 12/02/2022** |
| **Activity ID No.** | **Activity Name** | **Description of Work** | | | **Responsibility** |
| A001 | Documentation required for install and configuration. | [(Updated v2) Naming Convention v1.9.22 - OSYS3030/4200/Network Services Using Linux(B)/Smith,Mike (brightspace.com)](https://nscconline.brightspace.com/d2l/le/content/245808/viewContent/3502833/View) | | | Jeff Guitard |
| A002 | Resources required for install. | Fedora-Server-dvd-x86\_64-36-1.5.iso | | | Jeff Guitard |
| A003 | Documentation of object names required for implementation. | **Specify object names in preparation for implementation** | | | Jeff Guitard |
| **VM** Folder: | F:\OSYS3030\OSYS3030-LX06 | |
| **VM** Name: | OSYS3030-LX06 | |
| **VM** OS (selected during VM build): | Fedora 64-bit | |
| **System** Hardware Configuration: | Primary HD | 30GB |
| Additional HDs |  |
| RAM | 4GB |
| Processors/Cores | 1 processors/ 1 core |
| Network | IP Address (Static) | 192.168.208.140 |
| Subnet Mask | 255.255.255.0 |
| G/W Address | 192.168.208.2 |
| DNS Server Address |  |
| Installation Mode | New Install | |
| Time Zone: | Halifax am/pm | |
| OS Type | Fedora Server | |
| “Administrator” Password: | password | |
| Host Name: | lx06.osys3030.local | |
| Domain Name: | osys3030.local | |
| **Backup** Admin User: |  | |
| Password: |  | |
| DSRM Password: |  | |
|  | | |
| *Name and description of each snapshot to be taken during install.*  *Create a schedule of regular rollback points of the server and take regular snapshots of your server in shutdown state.* |  | |
| A004 | Required configurations or settings applied | **\*Assign root password**  ***\*Apply updates*** | | | Jeff Guitard |
| A005 | Additional Software required. |  | | | Jeff Guitard |
| A006 | “Snapshot” information: | Snapshot with description is to be taken after installation and after changes. | | | Jeff Guitard |
| A007 | “Gold” Copy information: | F:\OSYS3030\OSYS3030-LX06-GC | | | Jeff Guitard |

# Task 2: Executive Summary

Ansible is a software application for automation that can work across multiple types of platforms and operating environments. Ansible is a powerful tool that can be used for deploying applications, updating servers and workstations, configuration management and many other tasks that a systems administrator would perform on a regular basis. Ansible relies on a configuration file to use as instructions when completing tasks. A benefit of this method of using a configuration file to operate is that it allows for easy version control. The instructions used by Ansible are human-readable and can be used to configure a single workstation or even an entire network of computers, depending on what the user requires. Ansible is consider part of the “infrastructure as code” movement in Information Technology. The concept of “infrastructure as code” is treating computer infrastructure maintenance like software development with documentation of continued methods of network improvement and task automation for an organization. Ansible works by connecting the control computer running Ansible (the control node) to the clients or servers on a network that require configuration changes (managed nodes) and then sends a small program or “Ansible module” to the devices. The modules are controlled through SSH and removed when the process is finished. An easy way to provide the Ansible control node the login access that it requires to the management nodes is to use an SSH key. An SSH key is an access credential that enables automated remote access between devices. SSH keys come in pairs that consist of a public key and private key. These keys are used to keep the data exchanged between the devices encrypted. An Ansible module is a written model of a system state (an application installed on a group of workstations in an organization for example). The control node then communicates with the managed nodes to ensure that state of the nodes matches the module (in this example, that all the workstations have the required application installed). With Ansible’s automation this can allow multiple devices to be updated efficiently and accurately. The way that Ansible uses these modules is by using a “Playbook”. A playbook is a configuration file that provides the required instructions to the managed nodes to get them to the desired state. If a playbook runs on a system that is already properly configured, the configuration will not be changed. Since most of the work by Ansible is done by the modules, playbooks can be used to manage entire networks, yet are still easy to read and understand.

Ansible would be an asset to the Systems Administration team through the ability to send ad-hoc commands or “modules” remotely from a single device. For example, a Systems Admin could install new applications, system updates, reboot devices, ping computers for connectivity testing, monitor uptime, check free disk space and memory, and many other monitoring and maintenance activities remotely by using ansible from their laptop wherever they are. Using “Playbooks”, these modules can be added and scheduled to run automatically in a single human readable configuration file.

Some of the key advantages of using Ansible are that the Playbooks are easy to create, modify and understand. The simplicity of Ansibles design allows users to learn and advance in their abilities quickly through its easily interpreted documentation method. This also allows for more efficient troubleshooting when issues arise. The drawbacks of Ansible are that it does not provide a functional graphical user interface and is primary operated using command line only. The GUI that is available has known synchronization issues when used in conjunction with the command line. It is better to use the command line only when using Ansible to avoid potential conflicts. As well, Ansible has limited Windows operating system support, resulting in the necessity for a Linux control machine when managing Windows hosts on a network.

Despite potential shortcomings, overall, Ansible would be a great tool to add to the Systems Administration team. Remote reliable automation with the full ability to create, modify and execute files allows for efficient management of infrastructure without requiring technicians to physically travel to the location of the devices they are managing, freeing up more time for the IT team to address required in person issues and projects.

# Ansible hosts converted to text

# This is the default ansible 'hosts' file.

#

# It should live in /etc/ansible/hosts

#

# - Comments begin with the '#' character

# - Blank lines are ignored

# - Groups of hosts are delimited by [header] elements

# - You can enter hostnames or ip addresses

# - A hostname/ip can be a member of multiple groups

# Ex 1: Ungrouped hosts, specify before any group headers.

## green.example.com

## blue.example.com

## 192.168.100.1

## 192.168.100.10

[servers]

lx05 ansible\_ssh\_host=192.168.208.88

# Ex 2: A collection of hosts belonging to the 'webservers' group

## [webservers]

## alpha.example.org

## beta.example.org

## 192.168.1.100

## 192.168.1.110

# If you have multiple hosts following a pattern you can specify

# them like this:

## www[001:006].example.com

# Ex 3: A collection of database servers in the 'dbservers' group

## [dbservers]

##

## db01.intranet.mydomain.net

## db02.intranet.mydomain.net

## 10.25.1.56

## 10.25.1.57

# Here's another example of host ranges, this time there are no

# leading 0s:

## db-[99:101]-node.example.com

# Useful Ad-Hoc commands

**ansible servers -m ansible.builtin.copy -a "src=/etc/ansible/hosts dest=/root"**

#This command would be useful to copy files from the controller to the target hosts. I chose the file in the example so that I could copy the ansible host file that is on my ansible controller (Fedora CLI only) to my target host that has a GUI. I was then able to copy the contents of this file using the GUI and paste it into a Word document.

**ansible servers -m ansible.builtin.yum -a "name=httpd state=present"**

# This command is making sure that a specified program is installed on the target hosts and is updated to the latest version.

**ansible servers -m command -a uptime**

#This command can be used to check the uptime of target hosts. This could be helpful for an administrator to monitor if the system has gone down at unscheduled times (during a storm for example).

**ansible servers -a "free -m"**

# This command can be used to check the memory statistics on target hosts, this can be useful to monitor the used and free memory on a system.

**ansible servers –m setup | less**

#This command will display details of the setup of the target hosts including the IP configuration, MAC address, date and time, partition information, system processor, storage controllers, etc. By piping it into the command “less” is it more readable and presented one page at a time.

# Change Log

Graphical user interface, text, application, email

Description automatically generated

**Playbook.docx from change log:**

# Playbook.yaml

Copy the below code into a new .yaml file and save the file as **playbook.yaml** then use the command **ansible-playbook playbook.yaml** to run the playbook

---

- name: Jeff Guitard OSYS3030 Playbook

hosts: servers

tasks:

- name: Install system updates

yum:

name: '\*'

state: latest

- name: Install latest version of Apache (httpd)

yum:

name: httpd

state: latest

- name: Copy html file from controller source to host destination

copy:

src: /home/jguitard/index.html

dest: /var/www/html

- name: Enable and Restart Httpd Service

service:

name: httpd

enabled: true

state: restarted

- name: Configure Firewall

firewalld:

service: http

state: enabled

permanent: true

immediate: true

- name: Restart Firewall

service:

name: firewalld

state: restarted

# References

Ansible - Ad hoc Commands. Retrieved from www.tutorialspoint.com website: <https://www.tutorialspoint.com/ansible/ansible_ad_hoc_commands.htm>

Understanding YAML for Ansible. Retrieved from Enable Sysadmin website: <https://www.redhat.com/sysadmin/understanding-yaml-ansible>

Advantages and Disadvantages of Ansible. Retrieved from <https://www.whizlabs.com/blog/ansible-advantages-and-disadvantages>

What are SSH Keys? - Secure Shell Keys - JumpCloud. Retrieved from JumpCloud website: <https://jumpcloud.com/blog/what-are-ssh-keys>

What is Ansible? Retrieved from Opensource.com website: <https://opensource.com/resources/what-ansible>

YAML File Extension - What is a .yaml file and how do I open it? Retrieved, from fileinfo.com website: <https://fileinfo.com/extension/yaml>