



# Red Hat Training and Certification

DO417 Notes and Demos

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# Chapter 1. Introducing Red Hat Ansible Automation Platform

## 1.1. Windows Automation and Red Hat Ansible Automation Platform

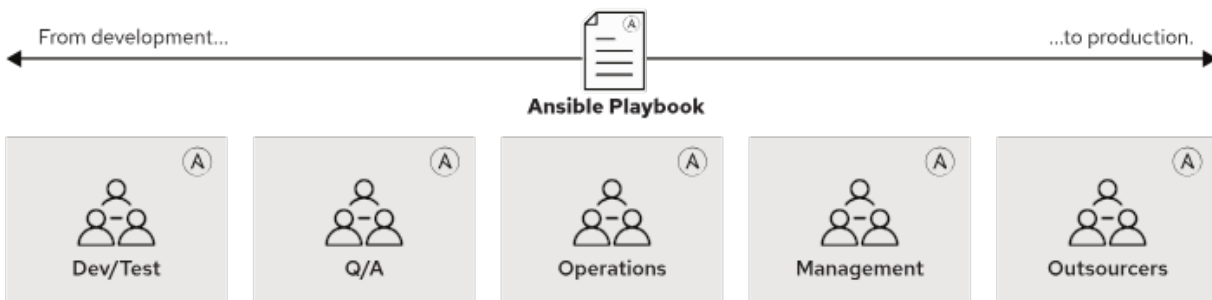
### 1.1.1. Introducing Automation and Windows System Administration

#### 1.1.1.1. Infrastructure as Code

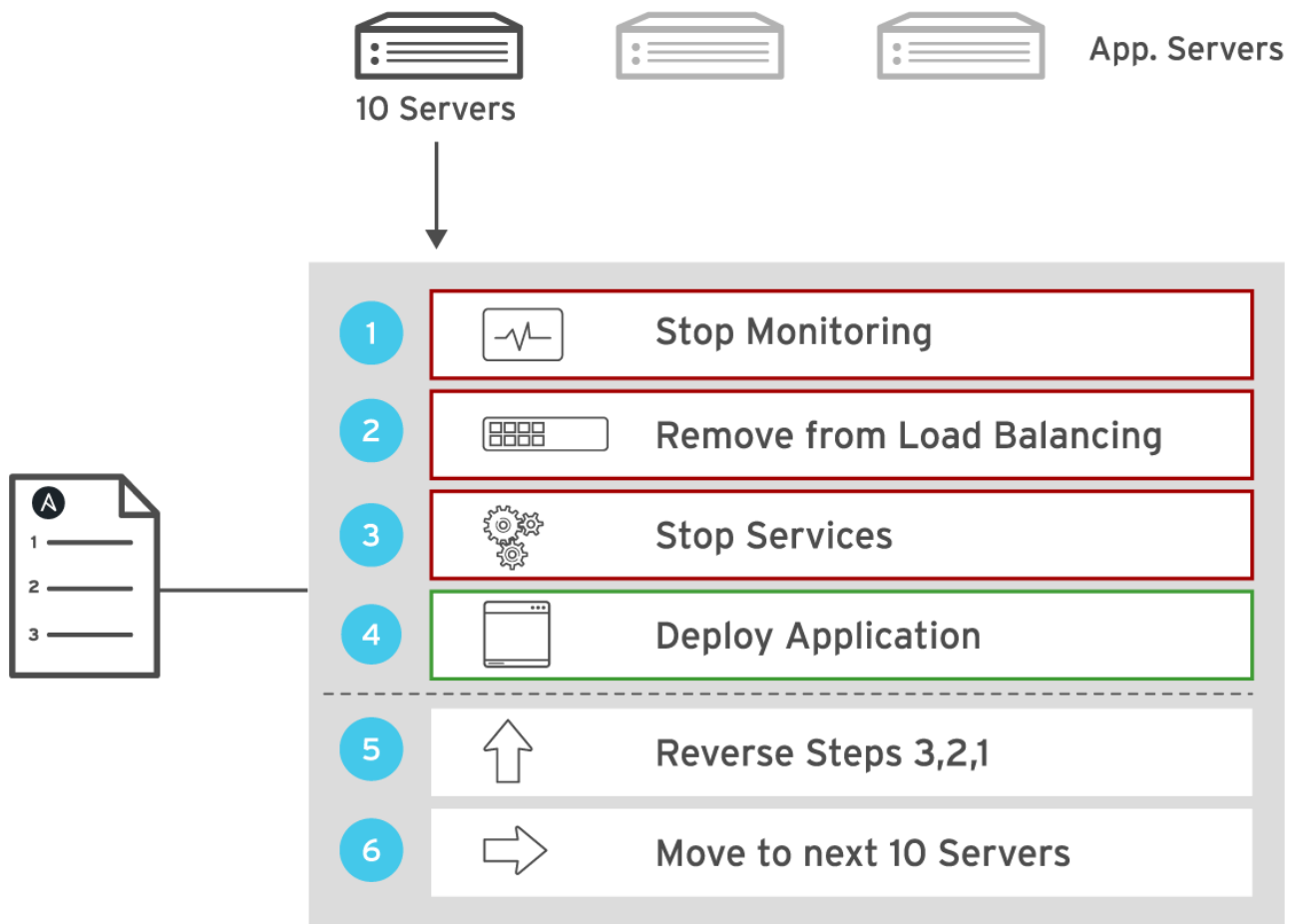
#### 1.1.1.2. Mitigating Human Error

#### 1.1.1.3. What is Ansible?

#### 1.1.1.4. Ansible: The Language of DevOps



*Figure 1. Ansible and SDLC*



*Figure 2. Ansible Automation Tasks*

## 1.1.2. Ansible Concepts and Architecture

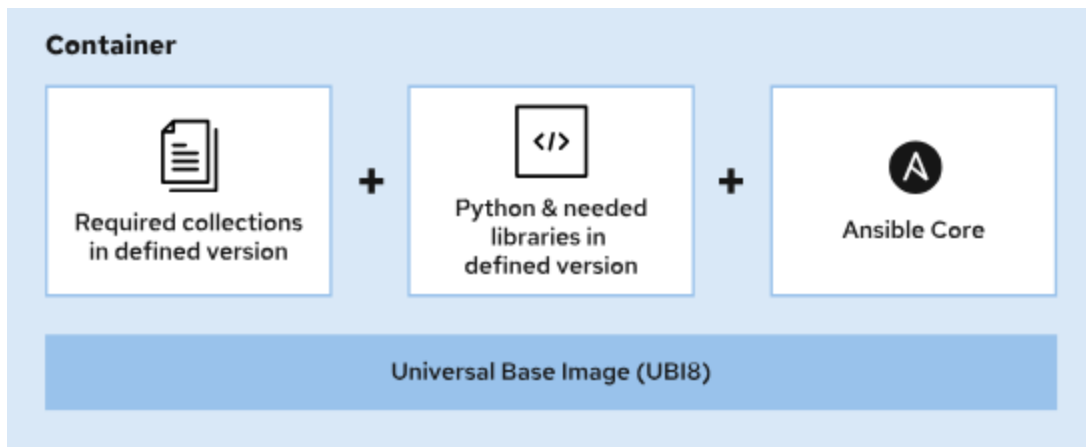
## 1.1.3. Red Hat Ansible Automation Platform 2 Components

### 1.1.3.1. Ansible Core

### 1.1.3.2. Ansible Content Collections

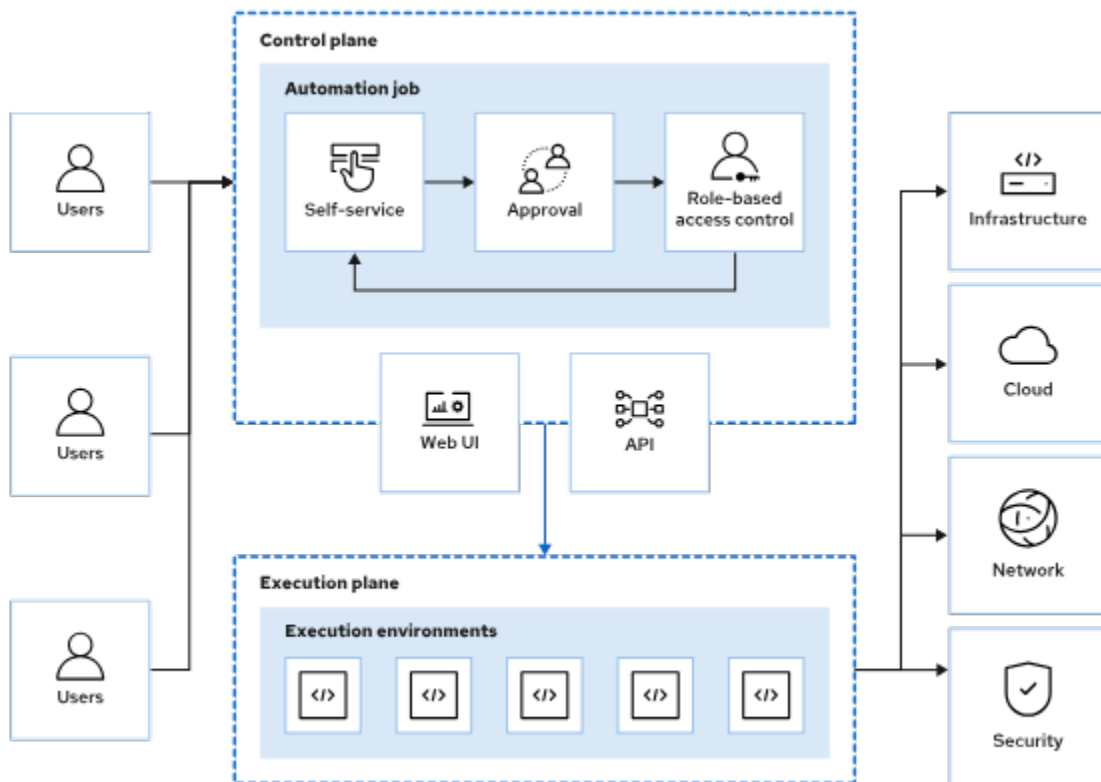
### 1.1.3.3. Automation Content Navigator

### 1.1.3.4. Automation Execution Environments



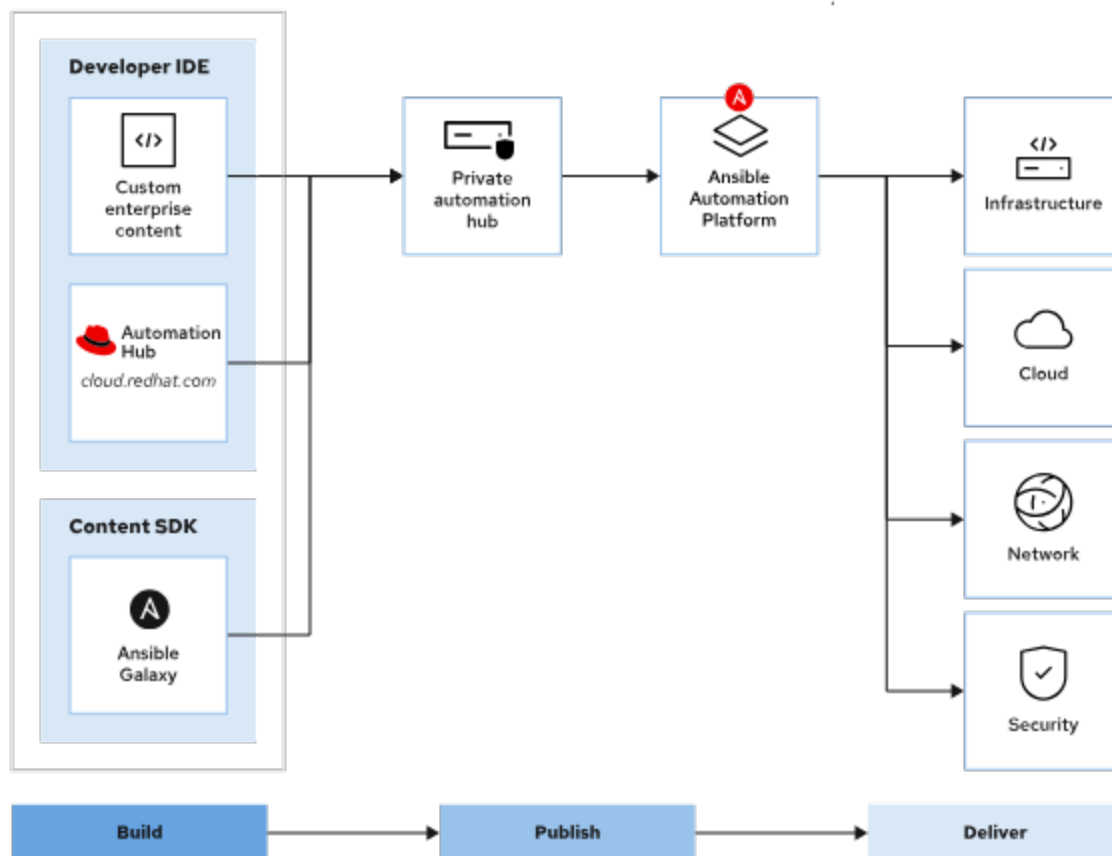
*Figure 3. Ansible Execution Environment Components*

### 1.1.3.5. Automation Controller



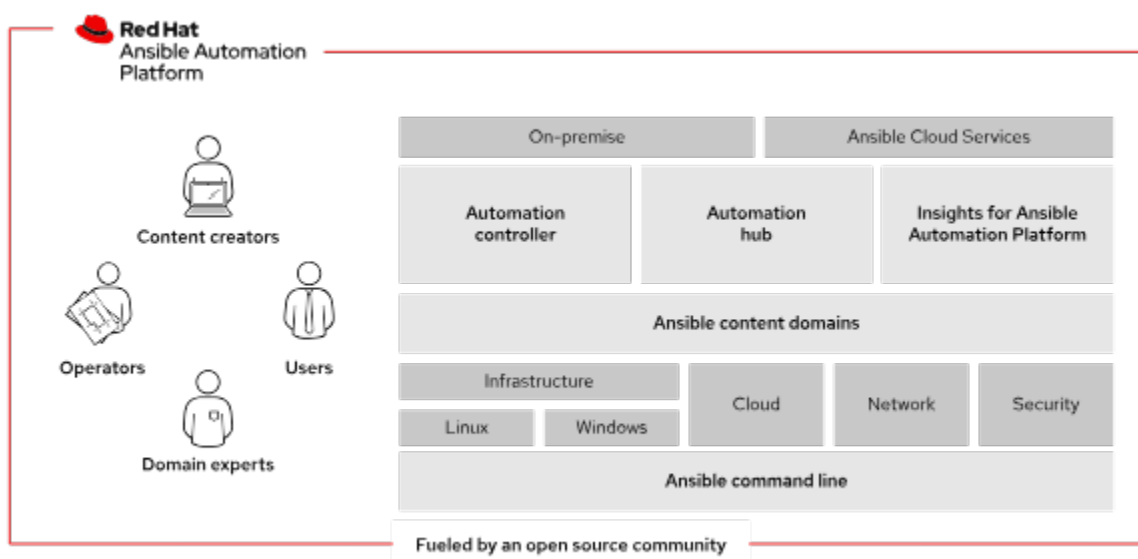
*Figure 4. Ansible Controller Components*

### 1.1.3.6. Automation Hub



*Figure 5. Ansible Automation Platform Components*

#### 1.1.4. Hosted Services



*Figure 6. Ansible Automation Platform Architecture*



## 1.2. Architecture of Windows Automation with Automation Controller

Section Info Here

### 1.2.1. Integrating Ansible in a Microsoft Windows Environment

### 1.2.2. Introducing Automation Controller

#### 1.2.2.1. Automation Controller Architecture

#### 1.2.2.2. Automation Execution Environments

#### 1.2.2.3. Automation Controller Features

- External credentials vaults
- Visual dashboard
- Role-based Access Control
- Graphical Inventory Management
- Job Scheduling
- Real-time and Historical Job Reporting
- User-Triggered Automation
- Remote Command Execution
- Credential Management

### 1.2.3. Interacting with Git Repositories

# Chapter 2. Preparing for Ansible Operations

## 2.1. Managing Files in Git with Visual Studio Code

Section Info Here

### Listing 1. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 2. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 1. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 2.1.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 7. Example Image Caption*

## 2.2. Preparing Microsoft Windows Hosts for Automation

Section Info Here

### Listing 3. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 4. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

  ## Start and Run the HTTPD Container
  - name: Start the Apache Container
    podman_container:
```

### Example 2. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 2.2.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 8. Example Image Caption*

## 2.3. Preparing Automation Controller to Manage Hosts

Section Info Here

### Listing 5. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 6. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 3. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 2.3.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 9. Example Image Caption*

# Chapter 3. Implementing Ansible Playbooks

## 3.1. Writing Playbooks

Section Info Here

### Listing 7. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 8. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 4. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 3.1.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 10. Example Image Caption*

## 3.2. Running Playbooks with Automation Controller

Section Info Here

### Listing 9. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 10. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 5. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 3.2.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 11. Example Image Caption*

## 3.3. Implementing Multiple Plays

Section Info Here

### Listing 11. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 12. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 6. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 3.3.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 12. Example Image Caption*

# Chapter 4. Managing Variables and Facts

## 4.1. Managing Variables

Section Info Here

### Listing 13. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 14. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 7. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 4.1.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 13. Example Image Caption*



## 4.2. Managing Secrets

Section Info Here

### Listing 15. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 16. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 8. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 4.2.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 14. Example Image Caption*

## 4.3. Managing Facts

Section Info Here

### Listing 17. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 18. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 9. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 4.3.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 15. Example Image Caption*

# Chapter 5. Installing and Configuring Software

## 5.1. Installing and Updating Software

Section Info Here

### Listing 19. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 20. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 10. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 5.1.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 16. Example Image Caption*

## 5.2. Editing the Windows Registry

Section Info Here

### Listing 21. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 22. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 11. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 5.2.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 17. Example Image Caption*

# Chapter 6. Implementing Task Control

## 6.1. Writing Loops and Conditional Tasks

Section Info Here

### Listing 23. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 24. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 12. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 6.1.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 18. Example Image Caption*

## 6.2. Implementing Handlers

Section Info Here

### Listing 25. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 26. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 13. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 6.2.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 19. Example Image Caption*

## 6.3. Handling Task Failure

Section Info Here

### Listing 27. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 28. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 14. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 6.3.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 20. Example Image Caption*



# Chapter 7. Deploying Files to Managed Hosts

## 7.1. Modifying and Transferring Files on Hosts

Section Info Here

### Listing 29. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 30. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 15. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 7.1.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 21. Example Image Caption*

## 7.2. Templating Files with Jinja2

Section Info Here

### Listing 31. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 32. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 16. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 7.2.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 22. Example Image Caption*

# Chapter 8. Reusing Code with Ansible Roles and Ansible Content Collections

## 8.1. Including and Importing Files

Section Info Here

### Listing 33. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 34. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 17. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 8.1.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 23. Example Image Caption*

## 8.2. Creating Roles

Section Info Here

### Listing 35. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 36. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 18. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 8.2.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 24. Example Image Caption*

## 8.3. Deploying Roles from External Content Sources

Section Info Here

### Listing 37. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 38. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 19. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 8.3.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 25. Example Image Caption*

## 8.4. Getting Roles and Modules from Ansible Content Collections

Section Info Here

### Listing 39. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 40. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 20. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 8.4.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 26. Example Image Caption*

# Chapter 9. Interacting with Users and Domains

## 9.1. Managing Local User Accounts

Section Info Here

### Listing 41. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 42. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 21. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 9.1.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.





*Figure 27. Example Image Caption*

## 9.2. Managing Active Directory Domains

Section Info Here

### Listing 43. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 44. Example Code box for YAML

```
---  
- name: Deploy HTTPD Server Demo  
  hosts: server  
  collections:  
  
  tasks:  
  
## Start and Run the HTTPD Container  
  - name: Start the Apache Container  
    podman_container:
```

### Example 22. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

### 9.2.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 28. Example Image Caption*

## 9.3. Generating Dynamic Inventories from Active Directory

Section Info Here

### Listing 45. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 46. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 23. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 9.3.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 29. Example Image Caption*

# Chapter 10. Automating Windows Administration Tasks

## 10.1. Integrating Ansible with Desired State Configuration Resources

Section Info Here

### Listing 47. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 48. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

  ## Start and Run the HTTPD Container
  - name: Start the Apache Container
    podman_container:
```

### Example 24. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 10.1.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 30. Example Image Caption*

## 10.2. Running Commands and Scheduling Tasks on Hosts

Section Info Here

### Listing 49. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 50. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 25. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 10.2.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 31. Example Image Caption*

## 10.3. Configuring and Managing Storage

Section Info Here

### Listing 51. Example Code box for CLI

```
[student@workstation ~]$ sudo yum module install container-tools
```

### Listing 52. Example Code box for YAML

```
---
- name: Deploy HTTPD Server Demo
  hosts: server
  collections:

  tasks:

## Start and Run the HTTPD Container
- name: Start the Apache Container
  podman_container:
```

### Example 26. LAB/Exercise: Hands-On Activity Example

1. Download a container image.
  - a. Registry: **registry.access.redhat.com**
  - b. Image: **ubi7**
2. Run the container

#### 10.3.1. <Section\_Sub\_Intro\_Here>

I am an image. Image directory in the chapter files is a symbolic link to the main "images" directory.



*Figure 32. Example Image Caption*

# Appendix A: Appendix A: DO417 Exam Objectives

- Configure Microsoft VSCode to work with Git and Ansible Automation Platform
  - Build inventories
  - Configure Microsoft Windows systems for management via Ansible Automation Platform
  - Configure Ansible Automation Platform to manage Microsoft Windows system
  - Create machine and source credentials
  - Write and run playbooks using Visual Studio Code
  - Work with Git and perform basic Git operations through VSCode
- Manage inventories and credentials
  - Create host groups
  - Assign systems to host groups
  - Configure inventory variables

```
ansible_user: username@MY.DOMAIN.COM
ansible_password: Password
ansible_connection: winrm
ansible_port: 5985 ①
ansible_winrm_transport: kerberos
```

① In official documentation () the port is 5985, however, in the class environment, we used port **5986**.

- Create and configure machine credentials to access hosts
- Create and configure source control credentials
- Manage task execution with Automation controller
  - Write and run playbooks
  - Create projects
  - Create job templates
  - Launch jobs
- Manage variables and facts.
  - Create flexible playbooks using variables
  - Gather facts from Windows hosts
- Implement task control



- Write loops and conditional tasks
- Handle task failures
- Utilize roles and Ansible Content Collections
  - Include and import files
  - Create Ansible automation roles
  - Get roles and modules from Ansible Content Collections
- Automate tasks for Microsoft Windows
  - Manage local users
  - Automate Software Installation on Windows
  - Create/Edit files on Windows
  - Automate Services Control on Windows
  - Manage Active Directory Domains
  - Manage and configure storage
  - Schedule tasks