Red Hat
Training and
Certification

DO417 Notes and Demos

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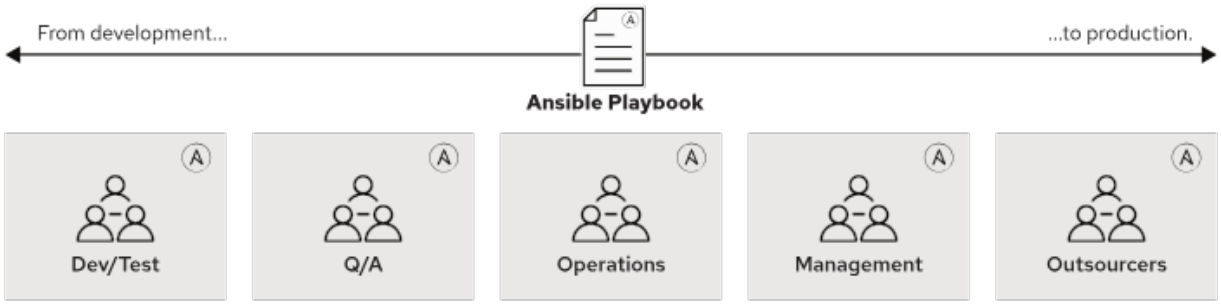
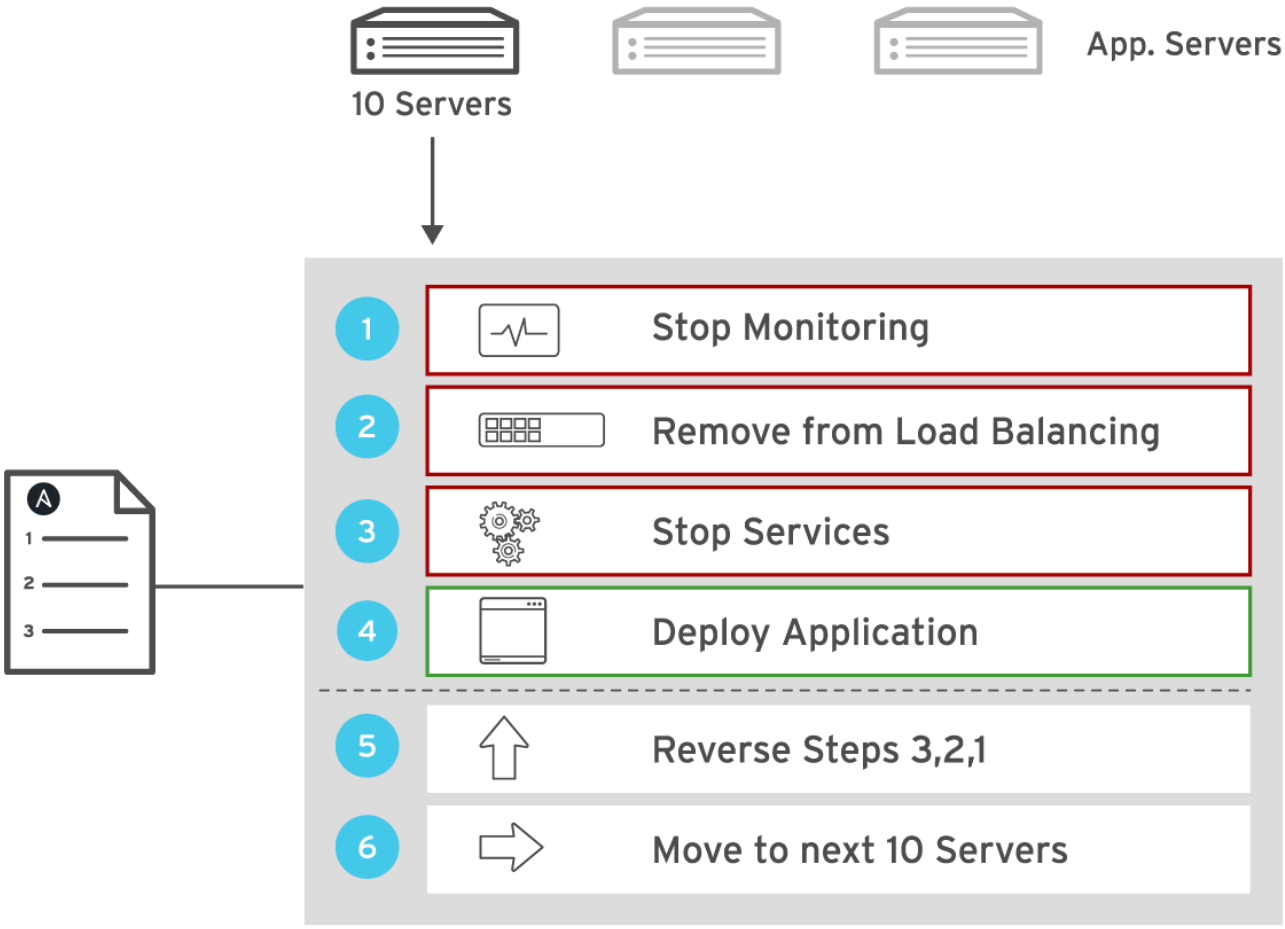


Figure 1. Ansible and SDLC



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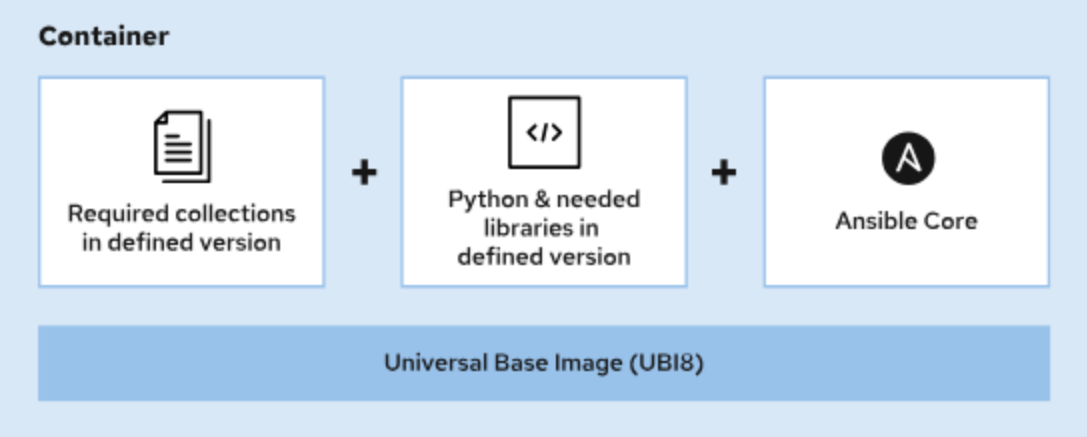


Figure 3. Ansible Execution Environment Components

1.1.3.5. Automation Controller

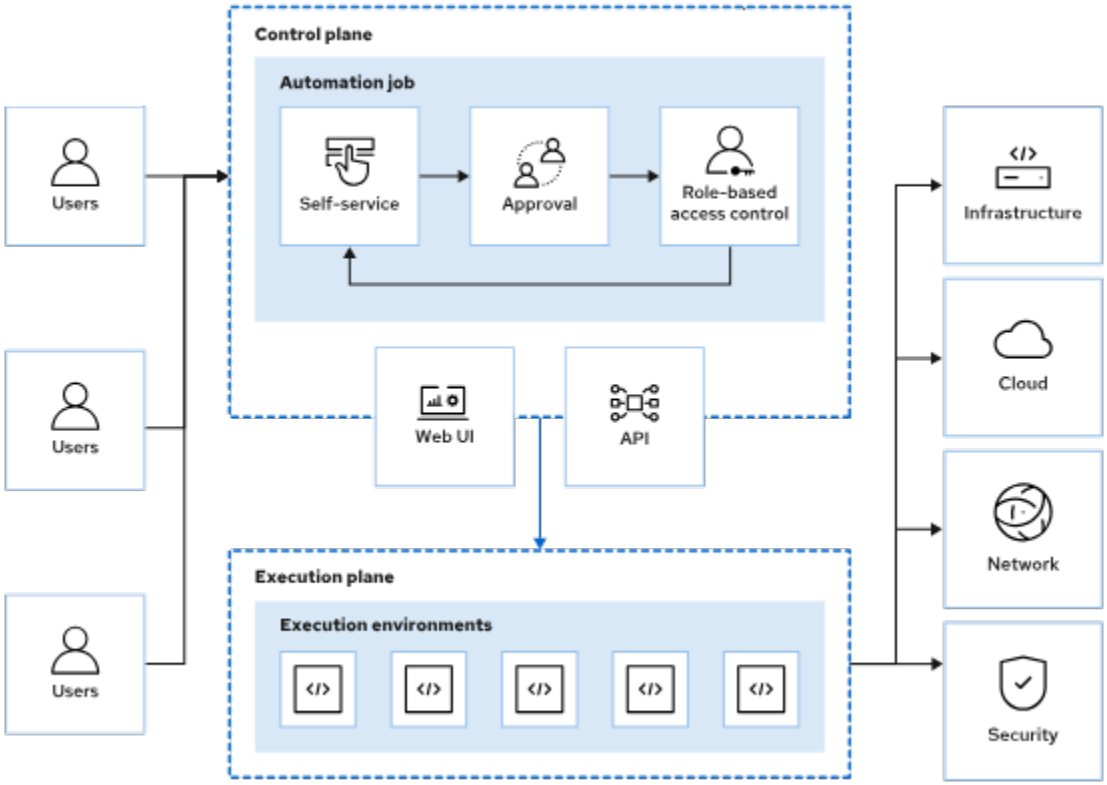


Figure 4. Ansible Controller Components

1.1.3.6. Automation Hub

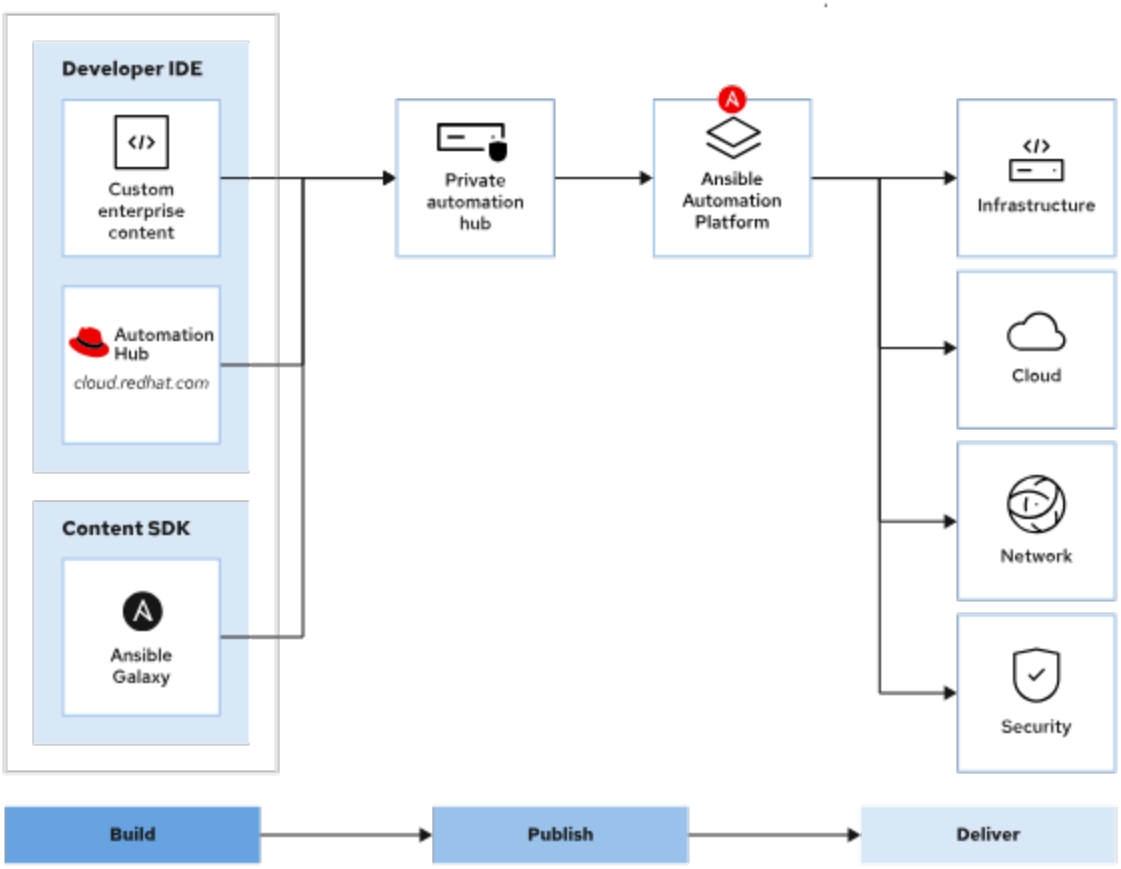
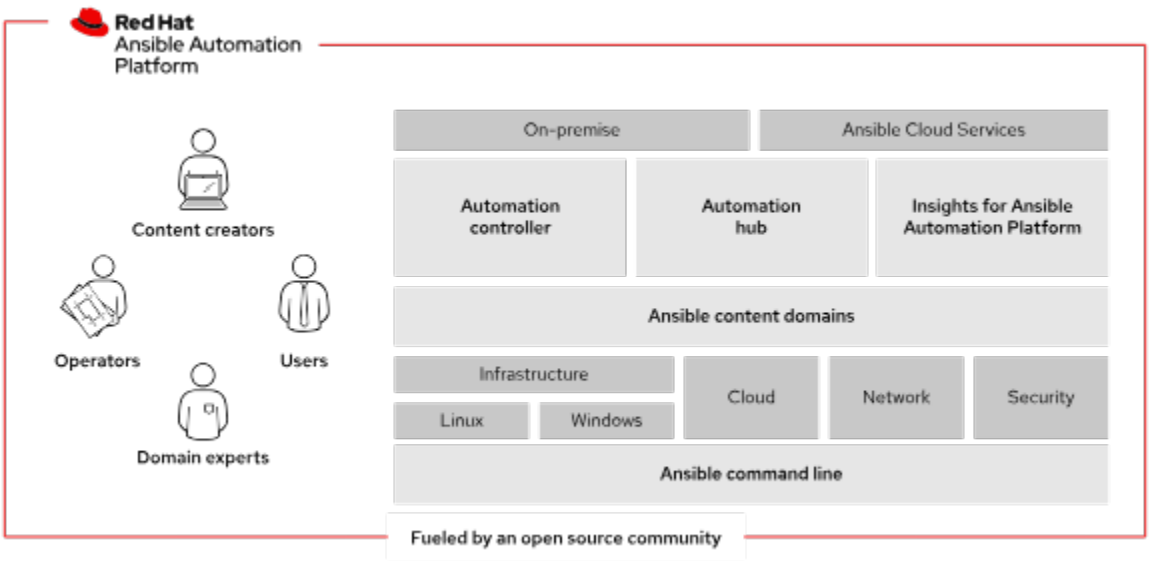


Figure 5. Ansible Automation Platform Components

1.1.4. Hosted Services



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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

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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: **ubi**7
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

Table 1. Selected Ansible Built-in Modules

Module	Description
`ansible.builtin.debug`	Print statements during playbook execution.
`ansible.builtin.add_host`	Dynamically add a managed host to the inventory when the playbook is running, to be used in later plays that have not yet run in that playbook.

Module	Description
ansible.builtin.assert	Claim that a condition is true, and succeed or fail depending on whether or not that is actually the case. (Conditions are not covered in this section of the course.)

The ansible.windows collection is not included with Ansible Core, but it is included in the ee-supported-rhel8 execution environment.

Table 2. Selected ansible.windows *Modules*

Module	Description
ansible.windows.win_copy	Copy files from the local machine to remote Windows hosts.
ansible.windows.win_file	Create and manage files and directories.
ansible.windows.slurp	Read a file from a remote Windows host.
ansible.windows.win_template	Dynamically generate a text file with the Jinja2 templating language and transfer it to a Windows host.
ansible.windows.win_service	Manage and query Windows services.
ansible.windows.win_feature	Install and uninstall Windows features on Windows Server.
ansible.windows.win_get_url	Download files over HTTP, HTTPS, or FTP to Windows host.
ansible.windows.win_uri	Interact with web services.
ansible.windows.win_whoami	Get information about the current Windows user and process.

Table 3. File Management Modules

Module name	Module description
ansible.windows.win_acl	Adds or removes rights and permissions to the specified file, folder, or registry key for a given user or group.
ansible.windows.win_copy	Copies files from local control nodes to Windows managed hosts.
ansible.windows.win_stat	Returns information about files.

Module name	Module description
ansible.windows.win_file	Creates files and updates modification time stamps on existing files. This module does not modify ownership or permissions, nor manipulate links.
community.windows.win_robocopy	Synchronizes the contents of files or folders from the source to a destination on the local Windows control nodes. This module calls the robocopy command, which is available on modern Microsoft Windows systems.
ansible.windows.win_owner	Sets the owner of files and folders.
community.windows.win_file_version	Retrieves the build versions of .dll or .exe files.
ansible.windows.win_find	Finds files based on specific criteria.
ansible.windows.win_tempfile	Creates temporary files and folders.
community.windows.win_unzip	Extracts compressed files and archives on the managed hosts.

    - 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