

Automating the Deployment of a Web Server on Windows Using Ansible Playbooks

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Introduction

Ansible simplifies the automation of web server deployments across multiple Windows servers, ensuring consistency and reducing manual configuration. In this guide, we'll create an Ansible playbook to automate the installation and configuration of IIS (Internet Information Services), a web server for Windows systems.

Problem Statement

Manually deploying web servers across multiple Windows systems can be time-consuming and error-prone. Automating this process using Ansible ensures uniformity, allows repeatable processes, and speeds up the deployment.

Prerequisites

Completion of all previous lab guides (up to Lab Guide-05) is required before proceeding with Lab Guide-06.

Before you begin, make sure you have the following setup:

Software Required

- **Windows Subsystem for Linux (WSL):** Installed on your control node.
- **Ansible 2.9 or later:** Installed and configured in the WSL environment.
- **WinRM:** Configured and running on the target Windows machines to allow remote management.

Hardware Requirements

- **Control Node:** A Windows machine with WSL and Ansible installed.
- **Target Node(s):** Remote Windows machines where the IIS web server will be deployed.

WinRM Setup on Windows Target Machines:

To configure WinRM on Windows:

```
winrm quickconfig  
winrm set winrm/config/service/auth '@{Basic="true"}'
```

Creating the Ansible Playbook

Step 1: Installing IIS Web Server

1. Navigate to your playbooks directory:

```
cd ~/ansible_playbooks
```

2. Create a new playbook file named `deploy_web_server.yml`:

```
nano deploy_web_server.yml
```

3. Add the following content to install IIS (Internet Information Services) on the target Windows servers:

```
- name: Deploy IIS Web Server on Windows  
  hosts: windows  
  tasks:  
    - name: Install IIS using DISM  
      win_shell: |  
        DISM /Online /Enable-Feature /FeatureName:IIS-WebServer /All  
      register: install_result  
  
    - name: Ensure IIS service is running  
      win_service:  
        name: W3SVC  
        state: started  
      when: install_result.rc == 0
```

```
---
- name: Deploy IIS Web Server on Windows
  hosts: windows # Use the appropriate group name from your inventory
  tasks:
    - name: Install IIS using DISM
      win_shell: |
        DISM /Online /Enable-Feature /FeatureName:IIS-WebServer /All
      register: install_result

    - name: Ensure IIS service is running
      win_service:
        name: W3SVC
        state: started # Change 'running' to 'started'
      when: install_result.rc == 0
```

In this section:

- The `win_feature` module installs IIS.
- The `win_service` module ensures that IIS is running and starts automatically.

Step 2: Setting Up Firewall Rules

To ensure IIS can be accessed, you need to add firewall rules:

1. Add the following task to open port 80 (HTTP):

```
- name: Open port 80 for HTTP
  win_firewall_rule:
    name: "Allow HTTP"
    enable: yes
    localport: '80'
    protocol: TCP
    action: allow
    direction: in
```

```
---
- name: Deploy IIS Web Server on Windows
  hosts: windows # Use the appropriate group name from your inventory
  tasks:
    - name: Install IIS using DISM
      win_shell: |
        DISM /Online /Enable-Feature /FeatureName:IIS-WebServer /All
      register: install_result

    - name: Ensure IIS service is running
      win_service:
        name: W3SVC
        state: started # Change 'running' to 'started'
      when: install_result.rc == 0

    - name: Open port 80 for HTTP
      win_firewall_rule:
        name: "Allow HTTP"
        enable: yes
        localport: '80'
        protocol: TCP
        action: allow
        direction: in
```

This rule ensures that incoming HTTP traffic is allowed on the server.

Step 3: Configuring the Web Server

We will now replace the default IIS welcome page with a simple "Hello World" HTML page.

1. First, create a local `index.html` file:

```
nano ~/ansible_playbooks/index.html
```

2. Add the following content to the HTML file:

```
<html>
<head>
  <title>Welcome to IIS!</title>
</head>
<body>
  <h1>Hello World!</h1>
  <p>This is a simple web server deployed using Ansible.</p>
</body>
</html>
```

```
<html>
<head>
  <title>Welcome to IIS!</title>
</head>
<body>
  <h1>Hello World!</h1>
  <p>This is a simple web server deployed using Ansible.</p>
</body>
</html>
```

3. Add a task in the playbook to copy this file to the target Windows machine:

```
- name: Copy custom Hello World HTML file to IIS
  win_copy:
    src: ./index.html # Path in WSL
    dest: C:\inetpub\wwwroot\index.html # IIS web root in Windows
```

```
---
- name: Deploy IIS Web Server on Windows
  hosts: windows # Use the appropriate group name from your inventory
  tasks:
    - name: Install IIS using DISM
      win_shell: |
        DISM /Online /Enable-Feature /FeatureName:IIS-WebServer /All
      register: install_result

    - name: Ensure IIS service is running
      win_service:
        name: W3SVC
        state: started # Change 'running' to 'started'
      when: install_result.rc == 0

    - name: Open port 80 for HTTP
      win_firewall_rule:
        name: "Allow HTTP"
        enable: yes
        localport: '80'
        protocol: TCP
        action: allow
        direction: in

    - name: Copy custom Hello World HTML file to IIS
      win_copy:
        src: ./index.html # Path in WSL
        dest: C:\inetpub\wwwroot\index.html # IIS web root in Windows
```

This task replaces the default IIS homepage with your custom "Hello World" page.

Step 4: Full Playbook YAML

Here's the complete `deploy_web_server.yml` file:

```
---
- name: Deploy IIS Web Server on Windows
  hosts: windows
  tasks:
    - name: Install IIS using DISM
      win_shell: |
        DISM /Online /Enable-Feature /FeatureName:IIS-WebServer /All
      register: install_result

    - name: Ensure IIS service is running
      win_service:
        name: W3SVC
        state: started
      when: install_result.rc == 0

    - name: Open port 80 for HTTP
      win_firewall_rule:
        name: "Allow HTTP"
        enable: yes
        localport: '80'
        protocol: TCP
        action: allow
        direction: in

    - name: Copy custom Hello World HTML file to IIS
      win_copy:
        src: ./index.html # make sure your file is in running directory
        dest: C:\inetpub\wwwroot\index.html
```

Executing the Playbook

Once your playbook is ready, you can execute it to deploy the IIS web server on the remote Windows systems.

Step 1: Run the Playbook

Run the playbook using the following command:

```
ansible-playbook deploy_web_server.yml
```

```

user1@Swayaan:~/ansible_playbooks$ ansible-playbook deploy_web_server.yml

PLAY [Deploy IIS Web Server on Windows] *****

TASK [Gathering Facts] *****
ok: [192.168.0.102]

TASK [Install IIS using DISM] *****
changed: [192.168.0.102]

TASK [Ensure IIS service is running] *****
ok: [192.168.0.102]

TASK [Open port 80 for HTTP] *****
changed: [192.168.0.102]

TASK [Copy custom Hello World HTML file to IIS] *****
ok: [192.168.0.102]

PLAY RECAP *****
192.168.0.102      : ok=5    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

```

Step 2: Provide Vault Password (if using)

If you are using Ansible Vault to manage sensitive data (e.g., passwords for connecting to the Windows hosts), add the following flag to the command:

```
ansible-playbook deploy_web_server.yml --ask-vault-pass
```

```

user1@Swayaan:~/ansible_playbooks$ ansible-playbook deploy_web_server.yml --ask-vault-pass
Vault password:

PLAY [Deploy IIS Web Server on Windows] *****

TASK [Gathering Facts] *****
ok: [192.168.0.102]

TASK [Install IIS using DISM] *****
changed: [192.168.0.102]

TASK [Ensure IIS service is running] *****
ok: [192.168.0.102]

TASK [Open port 80 for HTTP] *****
ok: [192.168.0.102]

TASK [Copy custom Hello World HTML file to IIS] *****
ok: [192.168.0.102]

PLAY RECAP *****
192.168.0.102      : ok=5    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

```

Verifying Web Server Deployment

Step 1: Check the IIS Service

After the playbook execution, verify that the IIS service is running on the target servers:

1. Log in to one of the remote Windows machines.
2. Open PowerShell as Administrator and run the following command:

```
Get-Service W3SVC
```

```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\WINDOWS\system32> Get-Service w3svc

Status      Name                DisplayName
-----
Running     w3svc              World Wide Web Publishing Service

PS C:\WINDOWS\system32>
```

This command will display the status of the IIS service (W3SVC). Ensure that it is running.

Step 2: Verify Web Access

To verify that the web server is running and accessible:

1. Open a web browser.
2. Navigate to `http://<target-machine-ip>`.



If the deployment was successful, you should see either the default IIS welcome page or your custom page (if you deployed one).

Supported References

For more information on automating Windows systems with Ansible, refer to:

- [Ansible Windows Documentation](#)
 - [Ansible Modules for Windows](#)
 - [IIS Documentation](#)
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