## Lab 16: Use Ansible to Back Up and Configure a Device

### Case Study

As one of the leading retail property management companies in Australia, Wisinity Hubs is the owner and operator of 62 shopping centers. In addition to providing guest internet services for shoppers, these venues rely on numerous internet-connected digital elements, such as digital wayfinding systems, digital media screens, and foot traffic counters, to support the company’s strategic vision.

The abrupt shift to remote work during the pandemic, combined with the complexity of its security environment, prompted Wisinity Hubs to reassess and modernize its approach to automating IT infrastructure configuration.

### Business Challenge

The incumbent IT team at Wisinity Hubs was unable to provide adequate solutions for managing IT infrastructure. The company sought a solution to automate the process of backing up the configuration of every Cisco CSR router deployed in its data centers. Manually backing up the configuration of each router in a data center is a highly time-consuming task.

To address this challenge, the company hired you, an individual certified as a Cisco DevNet Associate, to automate the backup process.

### Solution

The IT administrator of a company assigned you the task of automating the process of backing up the configuration of a Cisco CSR router. You choose to use Ansible to automate the configuration backup of the router. You developed an Ansible playbook that, when executed, automatically performs the backup of the router’s configuration.

Subsequently, you created another playbook to assign an IPv6 address to a specific interface on the Cisco CSR router.

Ansible is a popular open-source IT automation solution that simplifies operations like provisioning, configuration management, application deployment, and orchestration. It largely defines automation workflows using YAML, a human-readable declarative language.

Follow the steps to complete the lab:

1. Configure Ansible in a DEVASC VM.
2. Configure the Ansible playbook to take a backup of a Cisco CSR router configuration.
3. Configure the Ansible playbook to assign an IPv6 address to a Cisco CSR router interface.

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| **// Configure Ansible in DEVASC VM**  1. Double-click on a **Visual Studio Code** icon to open it.    2. Click on **File.** Then click on **Open Folder…**    3. Then navigate to the **/labs/devnet-src/ansible** directory and click **OK** to open it.    4. The two subdirectories for the Ansible labs are now loaded in the Visual Studio Code **EXPLORER** pane. In this lab, we will work on the **ansible-csr1000v** directory.    5. Ansible uses an inventory file called hosts that contains device information used by Ansible playbooks. Click on the **hosts** file in the **ansible-csr1000v** directory to open it.    6. Copy and paste the below-provided lines into the **hosts** file and press **Ctrl+S** to save the file. The hosts file defines an alias and essential SSH variables, **ansible\_user**, **ansible\_password**, and **ansible\_host** variablesused by Ansible to securely access the CSR router device.   |  | | --- | | # Enter the hosts or devices for Ansible playbooks  CSR1kv ansible\_user=cisco ansible\_password=cisco123! ansible\_host=<Enter Your IP Address> |     7. Open the terminal window and execute the following command: **cd** **labs/devnet-src/ansible/** to go inside the ansible directory.    8. Execute **ansible** command to get a list of the ansible commands.    9. Execute the **ansible --version** command to display version information. Notice that this lab is using version **2.9.9**. Ansible includes certain default files, including a default configuration file, **cfg**.    10. The **ansible.cfg** file is used by Ansible to set certain default values. These values can be modified. Using the default path displayed in the **ansible --version** command, display the default configuration file. Execute the following command: **cat /etc/ansible/ansible.cfg | more** to display the contents of the Ansible configuration file.    11. Ansible will use the config file located in **/etc/ansible/ansible.cfg** unless there is a **cfg** file in the current directory. Change back to the **ansible-csr1000v** directory by executing the **cd** **ansible-csr1000v** command. Then again execute the **ansible --version** command. There is already a placeholder **ansible.cfg** file in this directory.    12. Execute **cat** **ansible.cfg** command to display the file to see that it is empty, except for a comment. We will edit this file in the next step.    13. Now, we need to edit the **/ansible-csr1000v/ansible.cfg** file to include the location of the **hosts** inventory file. Remember, the default config file is in **/etc/ansible/ansible.cfg** uses the inventory file in /etc/ansible/hosts. Open the **/ansible-csr1000v/ansible.cfg** file in the **Visual Studio Code**.    14. Remove the comment. Copy and paste the below-provided lines to the file and then press **Ctrl+S** to save it.   |  | | --- | | # config file for ansible-csr1000v  [defaults]  # Use local hosts file in this folder  inventory=./hosts  host\_key\_checking = False # Don't worry about RSA Fingerprints  retry\_files\_enabled = False # Do not create them  deprecation\_warnings = False # Do not show warnings | |

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| **// Configure Ansible Playbook to Take Backup of Cisco CSR Router Configuration**  1. In the Visual Studio Code, create a new file in the **ansible-csr1000v** directory with the following name: **backup\_cisco\_router\_playbook.yaml**.    2. Copy the paste the below-provided script in the **backup\_cisco\_router\_playbook.yaml** file and then press **Ctrl+S** to save it.   |  | | --- | | ---  - name: AUTOMATIC BACKUP OF RUNNING-CONFIG  hosts: CSR1kv  gather\_facts: false  connection: local    tasks:  - name: DISPLAYING THE RUNNING-CONFIG  ios\_command:  commands:  - show running-config  register: config    - name: SAVE OUTPUT TO ./backups/  copy:  content: "{{ config.stdout[0] }}"  dest: "backups/show\_run\_{{ inventory\_hostname }}.txt" |   The Ansible playbook is a YAML file. Make sure you use the proper YAML indentation. Every space and dash is significant. You may lose some formatting if you copy and paste the code.    3. Execute the **mkdir backups** command to create a directory where the backup configuration of the Cisco CSR router file will be stored.    4. Execute **ping <Your Cisco CSR Router IP Address>** command to verify that the Cisco CSR router is it is properly accessible. Press **Ctrl+C** to abort the ping.    5. Execute the following command: **ansible-playbook backup\_cisco\_router\_playbook.yaml** to run ansible playbook.    6. In Visual Studio Code, open the **backups** folder and open the **show\_run\_CSR1kv.txt** file. You can also use the terminal window to cat the file with **cat backups/show\_run\_CSR1kv.txt**. You have successfully taken a backup of the Cisco CSR router configuration. |

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| **// Configure Ansible Playbook to Assigned IPv6 Address to Cisco CSR Router Interface**  1. In Visual Studio Code, create a new file in the **ansible-csr1000v** directory with the following name: **cisco\_router\_ipv6\_config\_playbook.yaml.**    2. Copy and paste the below-provided code and then press Ctrl+S to save it. Make sure you use the proper YAML indentation. Every space and dash is significant. You may lose some formatting when you copy and paste.   |  | | --- | | ---  - name: CONFIGURE IPv6 ADDRESSING  hosts: CSR1kv  gather\_facts: false  connection: local  tasks:  - name: SET IPv6 ADDRESS  ios\_config:  parents: "interface GigabitEthernet1"  lines:  - description IPv6 ADDRESS  - ipv6 address 2001:db8:acad:1::1/64  - ipv6 address fe80::1:1 link-local  - name: SHOW IPv6 INTERFACE BRIEF  ios\_command:  commands:  - show ipv6 interface brief  register: output  - name: SAVE OUTPUT ./ios\_configurations/  copy:  content: "{{ output.stdout[0] }}"  dest: "ios\_configurations/IPv6\_output\_{{ inventory\_hostname }}.txt" |     3. Execute the **mkdir ios\_configurations** to create a directory where the output for the **show ipv6 interface brief** command will be stored.    4. Execute the following command: **ansible-playbook -v cisco\_router\_ipv6\_config\_playbook.yaml** to run ansible playbook. The -v verbose option can be used to display the tasks being performed in the playbook.    5. In Visual Studio Code, open the **ios\_configurations** folder and click the **IPv6\_output\_CSR1kv.txt** file. You can also use the terminal window to view the file with **cat ios\_configurations/IPv6\_output\_CSR1kv.txt**. You have successfully assigned an IPv6 address to an interface in the Cisco CSR router. |