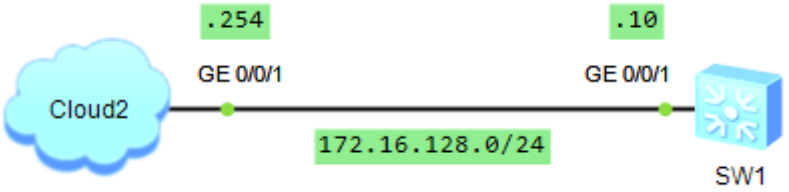
ЗЕРТХАНАЛЫҚ ЖҰМЫСТЫ орындауға арналған
ӘДІСТЕМЕЛІК НҰСҚАУЛЫҚ

Huawei eNSP симуляторын қолданған жағдайда

Тақырыбы: Network Automation. Ansible
Жұмыстың мақсаты: HCIA-Datacom деңгейін меңгеру

Жұмыстың орындалу қадамы:

1) Basic Configuration
2) Configure SSH Remote Management
3) Ansible on Ubuntu Linux



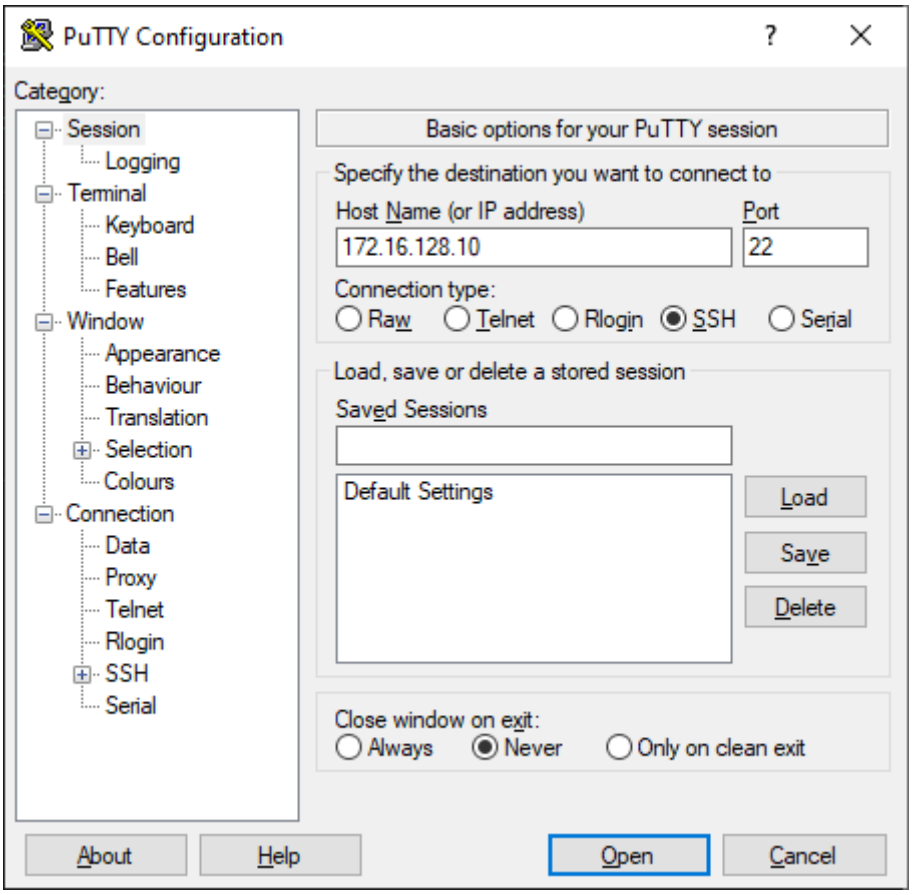
1-қадам: Basic Configuration

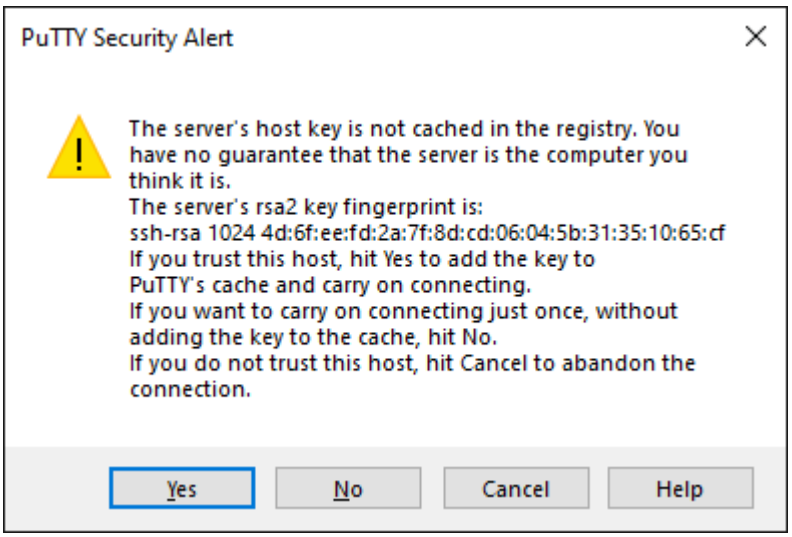
```
[Huawei] interface Vlanif 1
[Huawei-Vlanif1] ip address 172.16.128.10 24
[Huawei] display ip interface brief
```

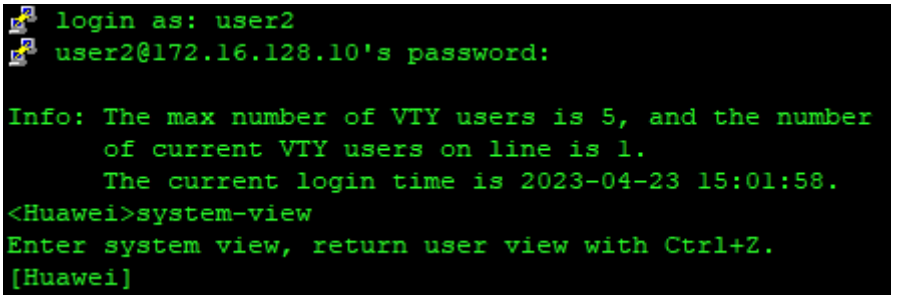
Interface	IP Address/Mask	Physical	Protocol
MEth0/0/1	unassigned	down	down
NULL0	unassigned	up	up(s)
Vlanif1	172.16.128.10/24	up	up

```
[Huawei] ping 172.16.128.254
Reply from 172.16.128.254: bytes=56 Sequence=1 ttl=128 time=60 ms
Reply from 172.16.128.254: bytes=56 Sequence=2 ttl=128 time=30 ms
Reply from 172.16.128.254: bytes=56 Sequence=3 ttl=128 time=30 ms
Reply from 172.16.128.254: bytes=56 Sequence=4 ttl=128 time=1 ms
Reply from 172.16.128.254: bytes=56 Sequence=5 ttl=128 time=50 ms
student@ubuntu22-04~$ ping -c4 172.16.128.10
64 bytes from 172.16.128.10: icmp_seq=1 ttl=255 time=16.1 ms
64 bytes from 172.16.128.10: icmp_seq=2 ttl=255 time=6.80 ms
64 bytes from 172.16.128.10: icmp_seq=3 ttl=255 time=22.2 ms
64 bytes from 172.16.128.10: icmp_seq=4 ttl=255 time=8.82 ms
```

Remote Access over PuTTY (Windows)







Remote Access over Terminal (Ubuntu Linux)

```
[Huawei] display ssh server status
```

```
SSH version                           :1.99
SSH connection timeout                :60 seconds
SSH server key generating interval    :0 hours
SSH authentication retries            :3 times
SFTP server                           :Disable
Stelnet server                        :Enable
Scp server                            :Disable
```

student@ubuntu22-04~$ `systemctl status ssh`

```
Active: active (running)
```

student@ubuntu22-04~$ `sudo nano .ssh/config`

```
Ciphers aes128-ctr,aes192-ctr,aes256-ctr,aes128-cbc,3des-cbc
KexAlgorithms +diffie-hellman-group-exchange-sha1,diffie-hellman-group1-sha1
HostKeyAlgorithms=+ssh-rsa
```

Ctrl+O ➜ Enter
Ctrl+X

student@ubuntu22-04~$ `ssh user2@172.16.128.10`

```
The authenticity of host '172.16.128.10 (172.16.128.10)' can't be established.
RSA key fingerprint is SHA256:6i6+lcOCd0W4UUklwtPLkeXtDHN9nR0tfLVlt6kYA8E.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '172.16.128.10' (RSA) to the list of known hosts.
user2@172.16.128.10's password:

Info: The max number of VTY users is 5, and the number
      of current VTY users on line is 1.
      The current login time is 2023-04-23 15:03:27.
<Huawei>system-view
Enter system view, return user view with Ctrl+Z.
[Huawei]
```

2-қадам: Configure SSH Remote Management

```
[Huawei] rsa local-key-pair create
Confirm to replace them? (y/n)[n]: y
Input the bits in the modulus[default = 512]: 1024

[Huawei] user-interface vty 0 4
[Huawei-ui-vty0-4] authentication-mode aaa
[Huawei-ui-vty0-4] protocol inbound all
[Huawei-ui-vty0-4] display this

[Huawei] aaa
[Huawei-aaa] local-user user2 password cipher user@123
[Huawei-aaa] local-user user2 privilege level 15
[Huawei-aaa] local-user user2 service-type ssh
[Huawei-aaa] display this

[Huawei] stelnet server enable
Succeeded in starting the STELNET server
```

```
[Huawei] ssh user user2
[Huawei] ssh user user2 authentication-type password
[Huawei] ssh user user2 service-type stelnet
```

3-қадам: Ansible on Ubuntu Linux

Installing Ansible on Ubuntu
https://docs.ansible.com/ansible/latest/installation_guide/index.html

```
$ sudo apt update
$ sudo apt install software-properties-common
$ sudo add-apt-repository --yes --update ppa:ansible/ansible
$ sudo apt update
$ sudo apt install ansible
```

student@ubuntu22-04~$ `ansible --version`

```
ansible [core 2.14.4]
```

student@ubuntu22-04~$ `ansible-playbook --version`

```
ansible-playbook [core 2.14.4]
```

student@ubuntu22-04~$ `sudo apt install python3-venv`

student@ubuntu22-04~$ `python3 -m venv ansible_vrp`
student@ubuntu22-04~$ `source ansible_vrp/bin/activate`
(ansible_vrp) student@ubuntu22-04~$ `python`

```
Python 3.10.6 (main, Mar 10 2023, 10:55:28) [GCC 11.3.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

Ctrl+D
(ansible_vrp) student@ubuntu22-04~$ `deactivate`

student@ubuntu22-04~$ `source ansible_vrp/bin/activate`
(ansible_vrp) student@ubuntu22-04~$ `python -m pip install ansible`
(ansible_vrp) student@ubuntu22-04~$ `python -m pip list`

```
Package      Version
------------ -------
ansible      7.4.0
ansible-core 2.14.4
cffi         1.15.1
cryptography 40.0.2
Jinja2       3.1.2
MarkupSafe   2.1.2
packaging    23.1
pip          22.0.2
pycparser    2.21
PyYAML       6.0
resolvelib   0.8.1
setuptools   59.6.0
```

$ sudo mkdir /etc/ansible/
$ sudo touch /etc/ansible/hosts
$ ls -l /etc/ansible/hosts
$ sudo chmod 777 /etc/ansible/hosts

$ sudo nano /etc/ansible/hosts

```
localhost ansible_connection=local

[switch]
172.16.128.10
```

$ sudo nano /etc/ansible/sysname.yml

```
---
- name: CloudEngine Basic Configuration
  hosts: switch
  connection: network_cli
  gather_facts: no
  vars:
      cli:
      host: "{{ inventory_hostname }}"
      port: "{{ ansible_ssh_port }}"
      username: "{{ username }}"
      password: "{{ password }}"
      transport: cli

  tasks:
      - name: "Configure Sysname"
      ce_config:
      lines: sysname SW1

      - name: "Save Configuration"
      ce_config:
      save: yes
```

Ctrl+O ➜ Enter
Ctrl+X

$ sudo nano /etc/ansible/switch.yml

```
---
username: "user2"
password: "user@123"
ansible_ssh_port: 22
ansible_network_os: ce
```

Ctrl+O ➜ Enter
Ctrl+X

(ansible_vrp) student@ubuntu22-04~$ `ls -l /etc/ansible/`

```
-rwxrwxrwx 1 root root  61 Apr 23 08:37 hosts
-rw-r--r-- 1 root root  95 Apr 23 08:08 switches.yml
-rw-r--r-- 1 root root 375 Apr 23 08:39 sysname.yml
```

(ansible_vrp) student@ubuntu22-04~$ `cd /etc/ansible/`
(ansible_vrp) student@ubuntu22-04/etc/ansible$ `ansible-playbook sysname.yml`

Reference

Virtual Environments and Packages
https://docs.python.org/3/tutorial/venv.html

```
---------------------------------------------------------------------------------------------- Playbook #1

 tasks:
      - name: "Configure Eth-trunk with Manual Mode"
      ce_eth_trunk:
      trunk_id: 3
      members: ['GE1/0/1', 'GE1/0/2']
      mode: manual
      state: present
---------------------------------------------------------------------------------------------- Playbook #2
 tasks:
      - name: "Ensure VLAN range 2-4094 is not existing on the switches group"
      ce_vlan:
      vlan_range: 2-4094
      state: absent

      - name: "Add VLAN range 3-9 to the switches group"
      ce_vlan:
      vlan_range: 3-9
      state: present
---------------------------------------------------------------------------------------------- Playbook #3
 tasks:
      - name: "Add interface Vlanif 3"
      ce_config:
      lines: interface Vlanif3

      - name: "Add interfaces GE1/0/1,2,3 to VLAN 3 and save configuration"
      ce_config:
      lines:
      - port link-type access
      - port default vlan 3
      - undo shutdown
      parents: interface range GE1/0/1 to GE 1/0/3
      save: yes
---------------------------------------------------------------------------------------------- Playbook #4
 tasks:
      - name: "Configure ipv4 address on Vlanif 3"
      ce_ip_interface:
      interface: Vlanif3
      version: v4
      state: present
      addr: "{{ ip_address }}"
      mask: 24
```