



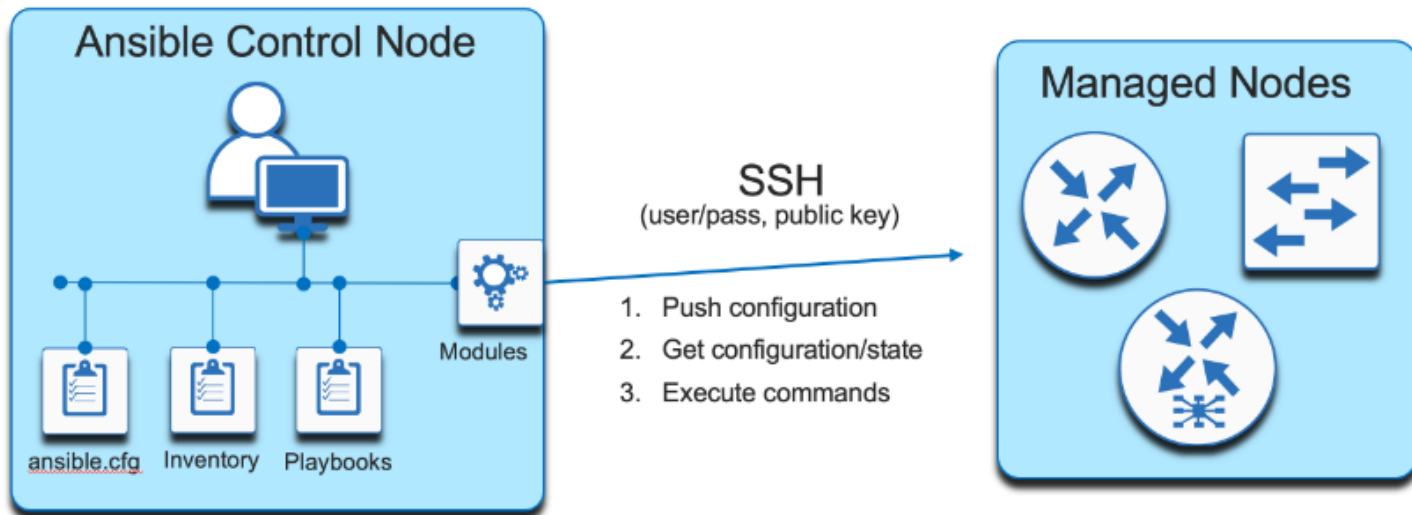
*Cisco  
Developers  
Connect  
SuperCAT*

Nov 29<sup>th</sup> 2023, Seoul Korea

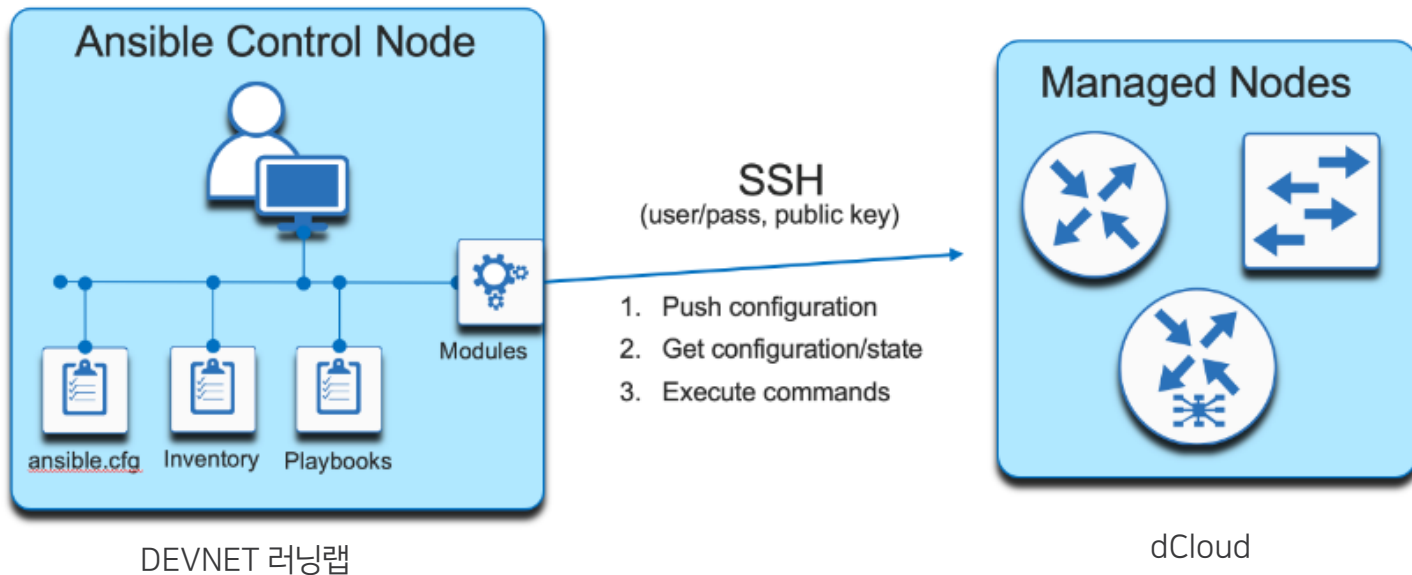
# Ansible & Catalyst (IOS-XE)

최우성 프로, 김혜영 프로

# Ansible 구조 - 일반 구조



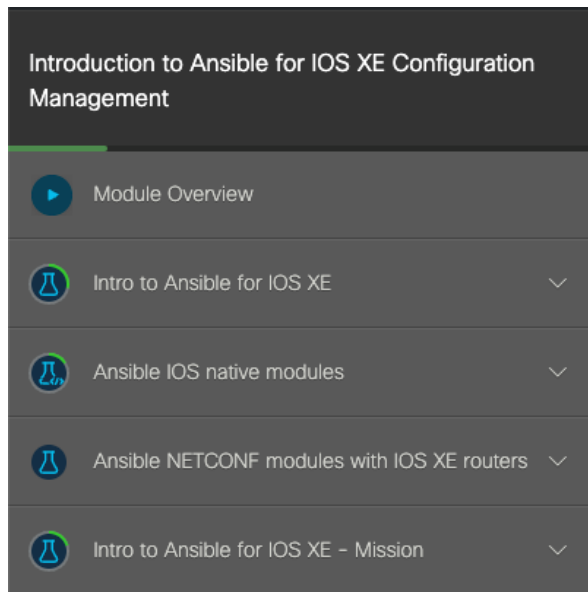
# Ansible 구조 - 오늘 구조



# DEVNET 러닝맵 접속

DEVNET 미션 Link

<https://developer.cisco.com/learning/modules/intro-ansible-iosxe/>



주의 : 우리에게엔 2시간만 허락 됩니다.

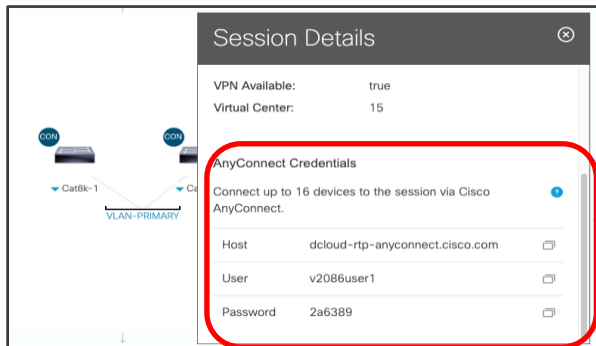


# Ansible 4대 요소

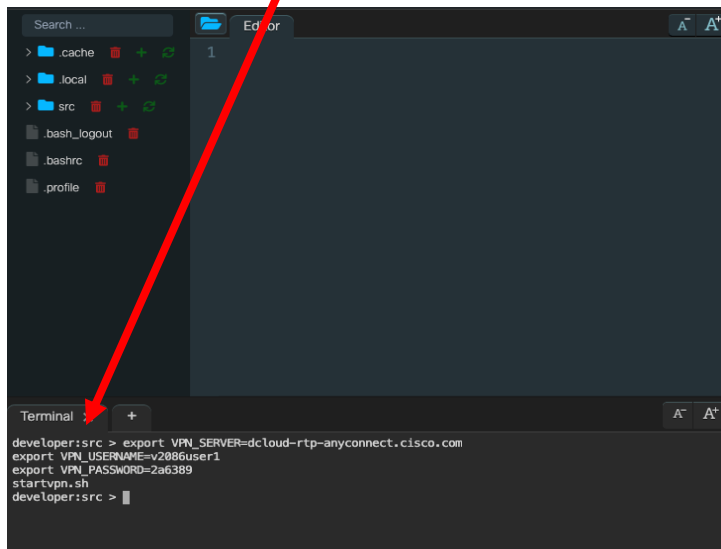
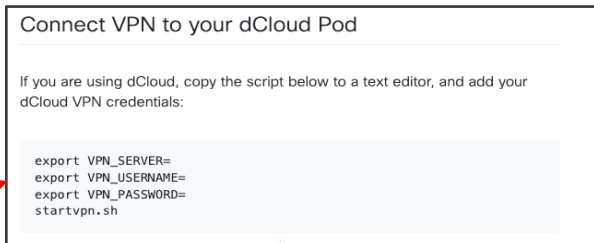
1. **Config file** - ansible.cfg -> Ansible의 기본 설정을 가짐. 어떤 기본 설정 (python interpreter, ssh key checking disable...)
2. **Inventory file** - Control node를 통해 제어 당할 host(network 장비)를 정의한 파일. Ansible을 실행 시키면 config file과 command line을 확인 하여 어떤 Inventory file을 사용 하여 구동 할지 결정.
3. **Playbook** - YAML document, Ansible이 수행할 업무 지정.
4. **Module** - Python으로 작성 된 재사용 가능한 독립 script. Module과 자동화된 CLI/API을 통해 Ansible은 host(network 장비)들과 상호 작용. IOS-XE Ansible Module (<https://docs.ansible.com/ansible/latest/collections/cisco/ios/>)

# DEVNET설정 - (1) dCloud 연결

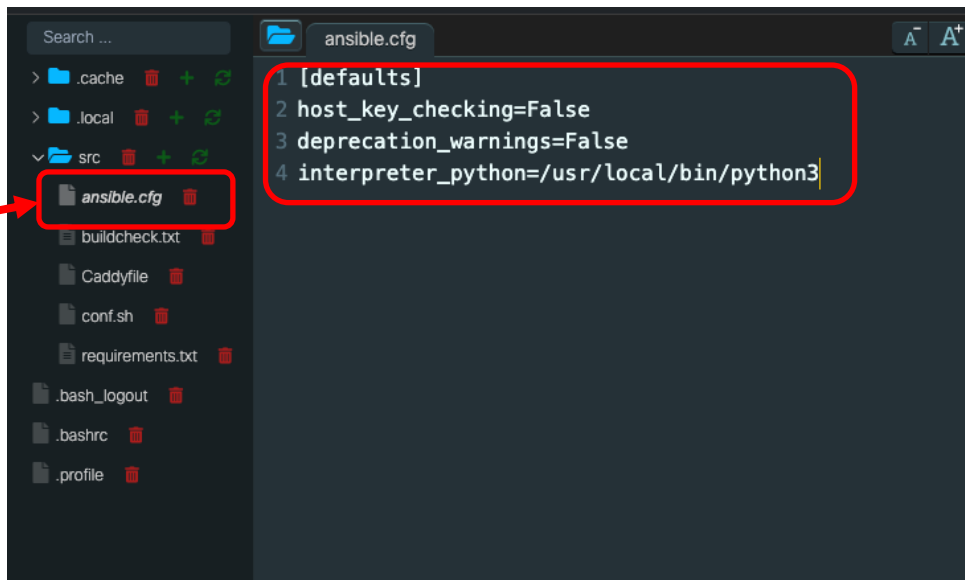
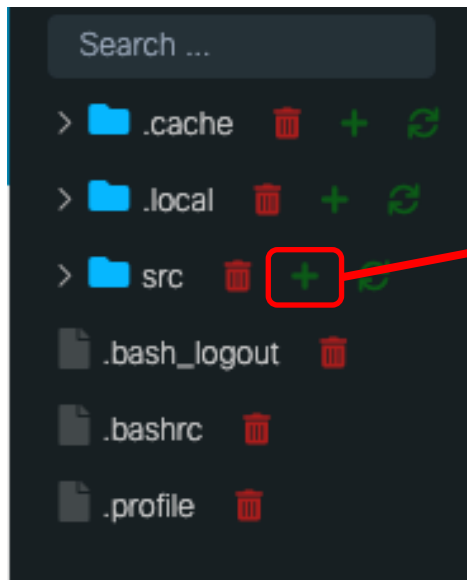
## DEVNET



dCloud

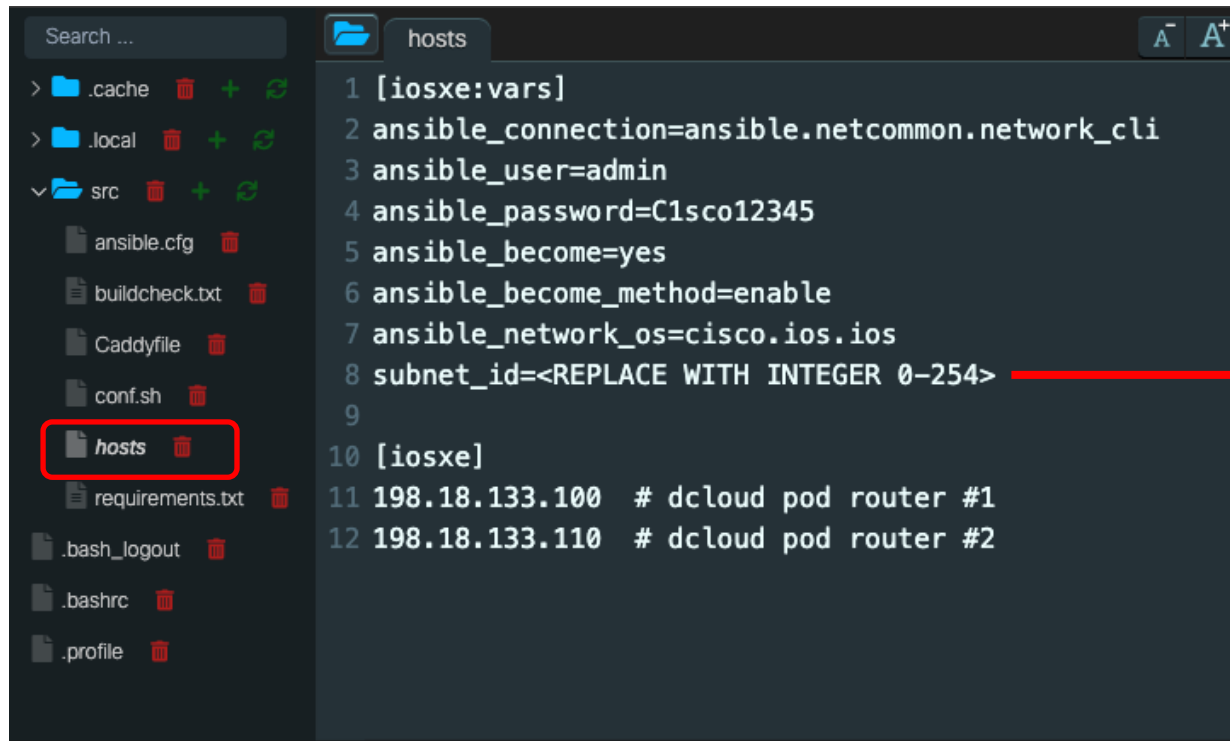


## DEVNET설정 - (2) Configuration file 생성





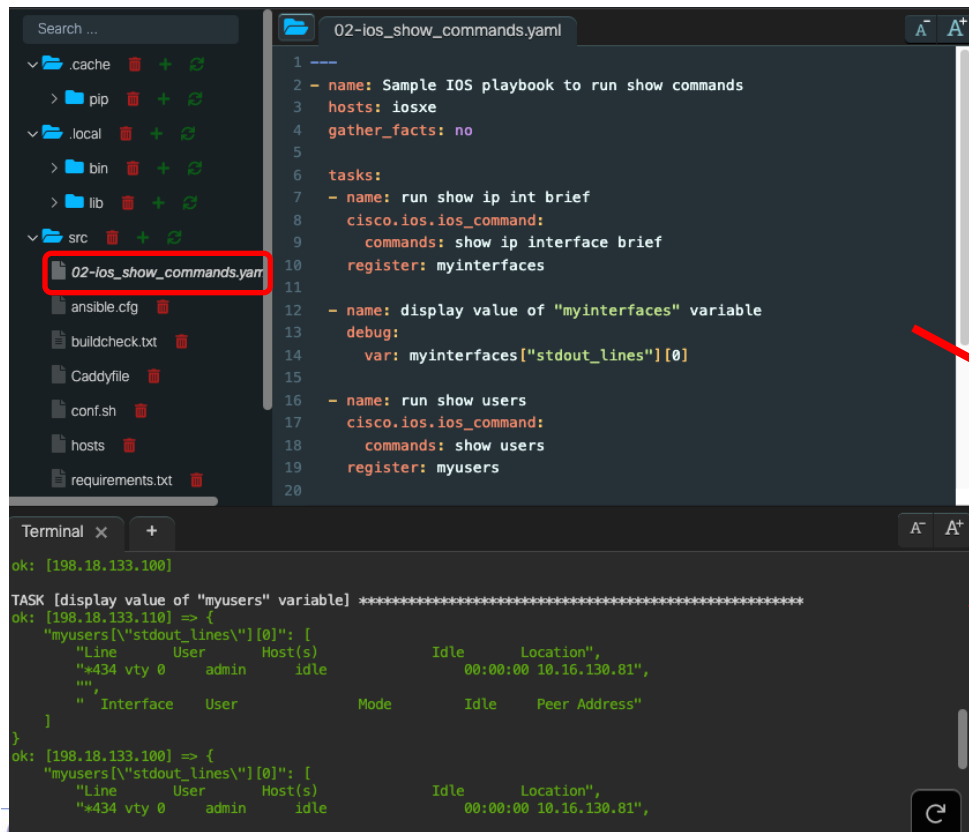
## DEVNET설정 - (3) Inventory file 생성



```
1 [iosxe:vars]
2 ansible_connection=ansible.netcommon.network_cli
3 ansible_user=admin
4 ansible_password=C1sco12345
5 ansible_become=yes
6 ansible_become_method=enable
7 ansible_network_os=cisco.ios.ios
8 subnet_id=<REPLACE WITH INTEGER 0-254>
9
10 [iosxe]
11 198.18.133.100 # dcloud pod router #1
12 198.18.133.110 # dcloud pod router #2
```

0-254 사이에서 원하는 값 입력

# DEVNET설정 - (4) TEST



The screenshot shows a code editor with a file explorer on the left and a terminal at the bottom. The file explorer highlights a file named `02-los_show_commands.yaml`. The code editor displays the content of this file, which is an Ansible playbook. The terminal shows the output of running the playbook, including the execution of the `show ip interface brief` command and the display of the `myinterfaces` variable.

```
02-los_show_commands.yaml
1 ---
2 - name: Sample IOS playbook to run show commands
3   hosts: iosxe
4   gather_facts: no
5
6   tasks:
7     - name: run show ip int brief
8       cisco.ios.ios_command:
9         commands: show ip interface brief
10        register: myinterfaces
11
12    - name: display value of "myinterfaces" variable
13      debug:
14        var: myinterfaces["stdout_lines"][0]
15
16    - name: run show users
17      cisco.ios.ios_command:
18        commands: show users
19        register: myusers
20
```

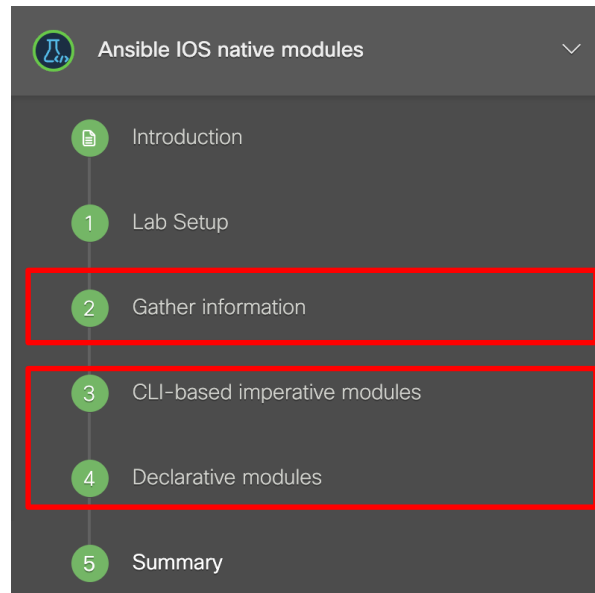
```
Terminal
ok: [198.18.133.100]

TASK [display value of "myusers" variable] *****
ok: [198.18.133.110] => {
  "myusers[\"stdout_lines\"][0]": [
    "Line      User      Host(s)      Idle      Location",
    "*434 vty 0      admin      idle        00:00:00  10.16.130.81",
    "",
    "Interface  User      Mode        Idle      Peer Address"
  ]
}
ok: [198.18.133.100] => {
  "myusers[\"stdout_lines\"][0]": [
    "Line      User      Host(s)      Idle      Location",
    "*434 vty 0      admin      idle        00:00:00  10.16.130.81",
    ""
  ]
}
```

`ansible-playbook -i hosts 02-los_show_commands.yaml`

# Hands-on 순서

- IOS-XE 장비에서 정보 가져오기
- IOS-XE 장비 설정 하기
- 미션



# IOS-XE 장비에서 정보 가져오기

## ios\_command 모듈

```
---
- name: Sample IOS playbook to run show commands
  hosts: iosxe
  gather_facts: no

  tasks:
    - name: run show ip int brief
      cisco.ios.ios_command:
        commands: show ip interface brief
        register: myinterfaces

    - name: display value of "myinterfaces" variable
      debug:
        var: myinterfaces["stdout_lines"][0]

    - name: run show users
      cisco.ios.ios_command:
        commands: show users
        register: myusers

    - name: display value of "myusers" variable
      debug:
        var: myusers["stdout_lines"][0]
```

# IOS-XE 장비에서 정보 가져오기

## ios\_command 모듈

```
---
- name: Sample IOS playbook to run show commands
  hosts: iosxe
  gather_facts: no

  tasks:
    - name: run show ip int brief
      cisco.ios.ios_command:
        commands: show ip interface brief
        register: myinterfaces

    - name: display value of "myinterfaces" variable
      debug:
        var: myinterfaces["stdout_lines"][0]

    - name: run show users
      cisco.ios.ios_command:
        commands: show users
        register: myusers

    - name: display value of "myusers" variable
      debug:
        var: myusers["stdout_lines"][0]
```

Playbook의 목적 : show commands 들 실행하기

# IOS-XE 장비에서 정보 가져오기

## ios\_command 모듈

```
---
- name: Sample IOS playbook to run show commands
  hosts: iosxe
  gather_facts: no

  tasks:
  - name: run show ip int brief
    cisco.ios.ios_command:
      commands: show ip interface brief
      register: myinterfaces

  - name: display value of "myinterfaces" variable
    debug:
      var: myinterfaces["stdout_lines"][0]

  - name: run show users
    cisco.ios.ios_command:
      commands: show users
      register: myusers

  - name: display value of "myusers" variable
    debug:
      var: myusers["stdout_lines"][0]
```

## Hosts

```
[iosxe:vars]
ansible_connection=ansible.netcommon.network_cli
ansible_user=admin
ansible_password=Cisco12345
ansible_become=yes
ansible_become_method=enable
ansible_network_os=cisco.ios.ios
subnet_id=<REPLACE WITH INTEGER 0-254>

[iosxe]
198.18.133.100 # dcloud pod router #1
198.18.133.110 # dcloud pod router #2
```

# IOS-XE 장비에서 정보 가져오기

## ios\_command 모듈

```
---
- name: Sample IOS playbook to run show commands
  hosts: iosxe
  gather_facts: no

  tasks:
    - name: run show ip int brief
      cisco.ios.ios_command:
        commands: show ip interface brief
        register: myinterfaces

    - name: display value of "myinterfaces" variable
      debug:
        var: myinterfaces["stdout_lines"][0]

    - name: run show users
      cisco.ios.ios_command:
        commands: show users
        register: myusers

    - name: display value of "myusers" variable
      debug:
        var: myusers["stdout_lines"][0]
```

### ios\_command 모듈

- 장비에 커맨드를 실행하고 결과를 return 하는 모듈
- configuration(구성을 바꾸는 커맨드)는 할 수 없음

# IOS-XE 장비에서 정보 가져오기

## los\_command 모듈

```
---
- name: Sample IOS playbook to run show commands
  hosts: iosxe
  gather_facts: no
```

### tasks:

- name: run show ip int brief  
 cisco.ios.ios\_command:  
 commands: show ip interface brief  
 register: myinterfaces
- name: display value of "myinterfaces" variable  
 debug:  
 var: myinterfaces["stdout\_lines"][0]
- name: run show users  
 cisco.ios.ios\_command:  
 commands: show users  
 register: myusers
- name: display value of "myusers" variable  
 debug:  
 var: myusers["stdout\_lines"][0]

```
8kv-1#show ip interface brief
Interface          IP-Address      OK? Method Status      Protocol
GigabitEthernet1   198.18.133.100 YES NVRAM    up          up
GigabitEthernet2   unassigned      YES NVRAM    administratively down down
GigabitEthernet3   unassigned      YES NVRAM    administratively down down
```

```
8kv-1#show users
Line      User      Host(s)          Idle      Location
*434 vty 0    admin        idle       00:00:00  10.16.169.50
 435 vty 1    admin        idle       00:00:01  10.16.169.49
```



# IOS-XE 장비에서 정보 가져오기

## ios\_command 모듈

```
---  
- name: Sample IOS playbook to run show commands  
  hosts: iosxe  
  gather_facts: no
```

```
  tasks:  
    - name: run show ip int brief  
      cisco.ios.ios_command:  
        commands: show ip interface brief  
        register: myinterfaces  
  
    - name: display value of "myinterfaces" variable  
      debug:  
        var: myinterfaces["stdout_lines"][0]  
  
    - name: run show users  
      cisco.ios.ios_command:  
        commands: show users  
        register: myusers  
  
    - name: display value of "myusers" variable  
      debug:  
        var: myusers["stdout_lines"][0]
```

### Register 모듈

- 커맨드의 결과값을 변수에 저장

# IOS-XE 장비에서 정보 가져오기

## ios\_command 모듈

```
---  
- name: Sample IOS playbook to run show commands  
  hosts: iosxe  
  gather_facts: no
```

```
  tasks:  
    - name: run show ip int brief  
      cisco.ios.ios_command:  
        commands: show ip interface brief  
        register: myinterfaces  
  
    - name: display value of "myinterfaces" variable  
      debug:  
        var: myinterfaces["stdout_lines"][0]  
  
    - name: run show users  
      cisco.ios.ios_command:  
        commands: show users  
        register: myusers  
  
    - name: display value of "myusers" variable  
      debug:  
        var: myusers["stdout_lines"][0]
```

### Debug 모듈

- 변수값을 콘솔에 보여줌

# IOS-XE 장비에서 정보 가져오기

## los\_facts 모듈

```
---
- name: Sample IOS playbook to retrieve facts
  hosts: iosxe
  gather_facts: no

  tasks:
  - name: retrieve ios facts
    cisco.ios.ios_facts:

  - name: display version and serial number
    debug:
      msg: "The IOS version is: {{ ansible_net_version }} and the SN is: {{ ansible_net_serialnum }}"

  - name: print out interface information
    debug:
      var: ansible_net_interfaces
```

# IOS-XE 장비에서 정보 가져오기

## Facts 란?

```
---
- name: Sample IOS playbook to retrieve facts
  hosts: iosxe
  gather_facts: no

  tasks:
  - name: retrieve ios facts
    cisco.ios.ios_facts:

  - name: display version and serial number
    debug:
      msg: "The IOS version is: {{ ansible_net_version }}" and

  - name: print out interface information
    debug:
      var: ansible_net_interfaces
```

```
192.168.66.136 | SUCCESS => {
  "ansible_facts": {
    "ansible_all_ipv4_addresses": [
      "192.168.66.136"
    ],
    "ansible_all_ipv6_addresses": [
      "fe80::37f6:8c10:7be5:d3fc",
      "fe80::f6db:3307:1e65:62c4"
    ],
    "ansible_apparmor": {
      "status": "disabled"
    },
    "ansible_architecture": "x86_64",
    "ansible_bios_date": "07/22/2020",
    "ansible_bios_vendor": "Phoenix Technologies LTD",
    "ansible_bios_version": "6.00",
    "ansible_board_asset_tag": "NA",
    "ansible_board_name": "440BX Desktop Reference Platform",
    "ansible_board_serial": "None",
    "ansible_board_vendor": "Intel Corporation",
    "ansible_board_version": "None",
    "ansible_chassis_asset_tag": "No Asset Tag",
    "ansible_chassis_serial": "None",
    "ansible_chassis_vendor": "No Enclosure",
    "ansible_chassis_version": "N/A",
    "ansible_cmdline": {
      "BOOT_IMAGE": "(hd0,msdos1)/vmlinuz-4.18.0-80.el8.x86_64",
      "quiet": true,
      "rd.lvm.lv": "rhel/swap",
      "resume": "/dev/mapper/rhel-swap",
      "rhgb": true,
      "ro": true,
      "root": "/dev/mapper/rhel-root"
    },
    "ansible_date_time": {
      "date": "2021-02-27",
      "day": "27",
      "epoch": "1614366695",
      "hour": "00",
      "iso8601": "2021-02-26T19:11:35Z",
      "iso8601_basic": "20210227T004135570760",
      "iso8601_basic_short": "20210227T004135",
      "iso8601_micro": "2021-02-26T19:11:35.570760Z",
      "minute": "41",
```

# IOS-XE 장비에서 정보 가져오기

## los\_facts 모듈

```
---
- name: Sample IOS playbook to retrieve facts
  hosts: iosxe
  gather_facts: no

  tasks:
  - name: retrieve ios facts
    cisco.ios.ios_facts:

  - name: display version and serial number
    debug:
      msg: "The IOS version is: {{ ansible_net_version }} and the SN is: {{ ansible_net_serialnum }}"

  - name: print out interface information
    debug:
      var: ansible_net_interfaces
```

los/ iosxe 장비에서는  
gather\_facts 대신 ios\_facts를 사용

# IOS-XE 장비에서 정보 가져오기

## ios\_facts 모듈

```
---
- name: Sample IOS playbook to retrieve facts
  hosts: iosxe
  gather_facts: no

  tasks:
  - name: retrieve ios facts
    cisco.ios.ios_facts:

  - name: display version and serial number
    debug:
      msg: "The IOS version is: {{ ansible_net_version }}"

  - name: print out interface information
    debug:
      var: ansible_net_interfaces
```

### Return Values

Common return values are documented [here](#), the following are the fields unique to this module:

Key	Description
<code>ansible_net_all_ipv4_addresses</code> <small>list / elements=string</small>	All IPv4 addresses configured on the device <b>Returned:</b> when interfaces is configured
<code>ansible_net_all_ipv6_addresses</code> <small>list / elements=string</small>	All IPv6 addresses configured on the device <b>Returned:</b> when interfaces is configured
<code>ansible_net_api</code> <small>string</small>	The name of the transport <b>Returned:</b> always
<code>ansible_net_config</code> <small>string</small>	The current active config from the device <b>Returned:</b> when config is configured
<code>ansible_net_cpu_utilization</code> <small>dictionary</small>	The current CPU utilization of the device <b>Returned:</b> when hardware is configured
<code>ansible_net_filesystems</code> <small>list / elements=string</small>	All file system names available on the device <b>Returned:</b> when hardware is configured
<code>ansible_net_filesystems_info</code> <small>dictionary</small>	A hash of all file systems containing info about each file system (e.g. free and total space) <b>Returned:</b> when hardware is configured
<code>ansible_net_gather_network_resources</code> <small>list / elements=string</small>	The list of fact for network resource subsets collected from the device <b>Returned:</b> when the resource is configured
<code>ansible_net_gather_subset</code> <small>list / elements=string</small>	The list of fact subsets collected from the device <b>Returned:</b> always
<code>ansible_net_hostname</code> <small>string</small>	The configured hostname of the device <b>Returned:</b> always
<code>ansible_net_image</code> <small>string</small>	The image file the device is running <b>Returned:</b> always
<code>ansible_net_interfaces</code>	A hash of all interfaces running on the system

🔍 Search this site

자료 : [https://docs.ansible.com/ansible/latest/collections/cisco/ios/ios\\_facts\\_module.html](https://docs.ansible.com/ansible/latest/collections/cisco/ios/ios_facts_module.html)

# IOS-XE 장비에서 정보 가져오기

## ios\_facts 모듈

```
---
- name: Sample IOS playbook to retrieve facts
  hosts: iosxe
  gather_facts: no

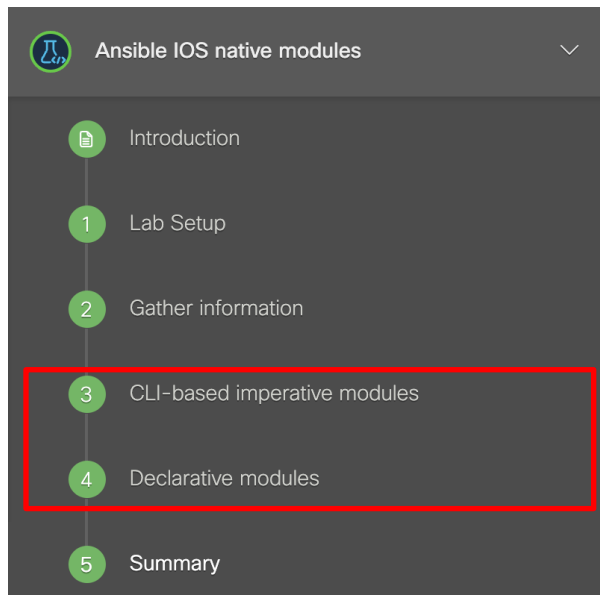
  tasks:
    - name: retrieve ios facts
      cisco.ios.ios_facts:

    - name: display version and serial number
      debug:
        msg: "The IOS version is: {{ ansible_net_version }}" and the SN is: {{ ansible_net_serialnum }}

    - name: print out interface information
      debug:
        var: ansible_net_interfaces
```

자료 : [https://docs.ansible.com/ansible/latest/collections/cisco/ios/ios\\_facts\\_module.html](https://docs.ansible.com/ansible/latest/collections/cisco/ios/ios_facts_module.html)

# IOS-XE 장비 설정하기



CLI-based imperative modules 와 Declarative modules의 차이점?

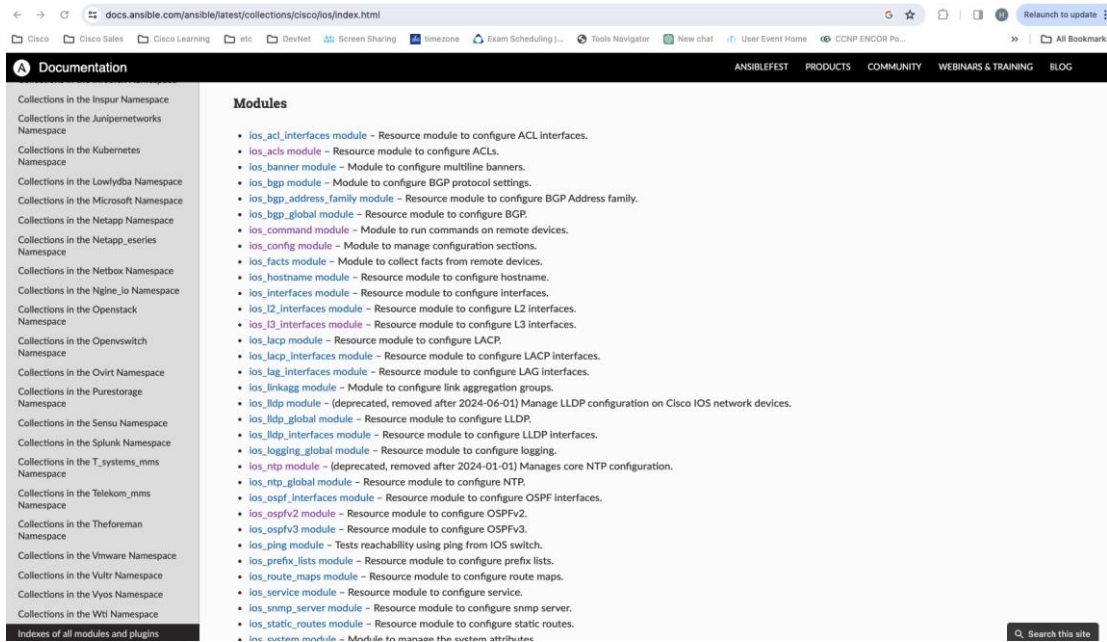


# Imperative Modules vs Declarative Modules

Imperative 명령형 모듈	Declarative 선언형 모듈
<p><u>How</u>에 집중.</p> <p>어떠한 목적을 이루기 위해서 <u>커맨드 라인</u>을 이용해서 모두 입력하는 방식</p>	<p><u>What</u>에 집중.</p> <p>어떠한 목적을 이루기 위해서 <u>필요한 값들만 입력</u>하는 방식</p>
<p>예시 ) ios_config 모듈</p> <pre>- name: Load new acl into device   cisco.ios.ios_config:     lines:       - 10 permit ip host 192.0.2.1 any log       - 20 permit ip host 192.0.2.2 any log       - 30 permit ip host 192.0.2.3 any log       - 40 permit ip host 192.0.2.4 any log       - 50 permit ip host 192.0.2.5 any log     parents: ip access-list extended test     before: no ip access-list extended test</pre>	<p>예시 ) ios_acls 모듈</p> <pre>- name: extended_acl_1   acl_type: extended   aces:     - grant: deny       protocol_options:         tcp:           fin: true       source:         address: 192.0.2.0         wildcard_bits: 0.0.0.255       destination:         address: 192.0.3.0         wildcard_bits: 0.0.0.255</pre>

# Ansible ios modules documentation

- <https://docs.ansible.com/ansible/latest/collections/cisco/ios/index.html>



# IOS-XE 장비 설정하기

CLI-based imperative modules

- 목표 : ntp서버 와 acl 설정하기
- 필요한 ansible playbook (2개)
  - 1) 02-show\_ntp\_acl.yaml  
: los\_command 모듈을 이용하여 현재 ntp, acl 정보를 보여주는 playbook
  - 2) 02-create\_ntp\_acl.yaml  
: los\_config 모듈을 이용하여 ntp와 acl 을 설정해주는 playbook

# IOS-XE 장비 설정하기

## Declarative modules

- 목표 : loopback 인터페이스를 생성하고, ip 설정하기
- 필요한 ansible playbook (2개)
  - 1) 02-int\_facts.yaml  
: ios\_facts 모듈을 이용하여 현재 인터페이스 정보를 보여주는 playbook
  - 2) 02-create\_loopback.yaml  
: 여러 선언형 모듈을 이용하여 loopback interface를 생성하고 ip를 설정해주는 playbook

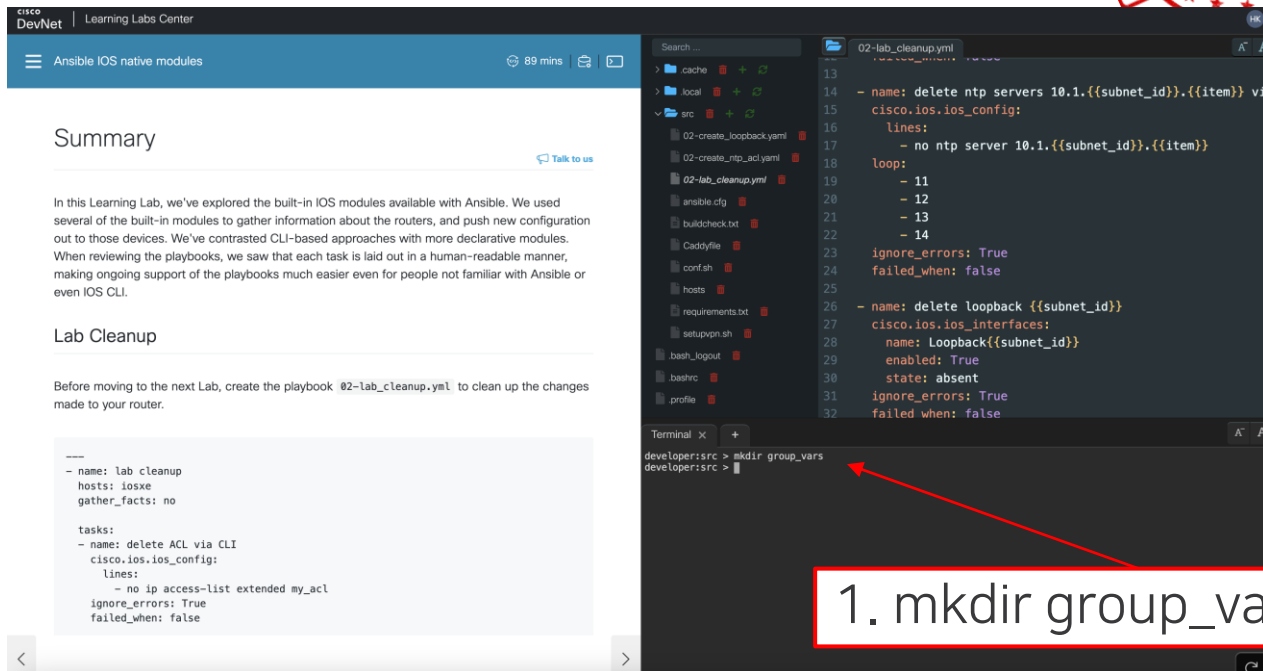
# Summary

- IOS-XE 장비에서 정보 가져오기
  - los\_command
  - los\_facts
- IOS-XE 장비 설정하기
  - los\_config (명령형 모듈)
  - los\_interfaces, ios\_l3\_interfaces (선언형 모듈)

# 미션!



# 미션 Setup

**MISSION**

**Summary**

In this Learning Lab, we've explored the built-in IOS modules available with Ansible. We used several of the built-in modules to gather information about the routers, and push new configuration out to those devices. We've contrasted CLI-based approaches with more declarative modules. When reviewing the playbooks, we saw that each task is laid out in a human-readable manner, making ongoing support of the playbooks much easier even for people not familiar with Ansible or even IOS CLI.

**Lab Cleanup**

Before moving to the next Lab, create the playbook `02-lab_cleanup.yml` to clean up the changes made to your router.

```
---
- name: lab cleanup
  hosts: iosxe
  gather_facts: no

  tasks:
  - name: delete ACL via CLI
    cisco.ios.ios_config:
      lines:
        - no ip access-list extended my_acl
      ignore_errors: True
      failed_when: false
```

**02-lab\_cleanup.yml**

```
13
14 - name: delete ntp servers 10.1.{{subnet_id}}.{{item}} via
15   cisco.ios.ios_config:
16     lines:
17       - no ntp server 10.1.{{subnet_id}}.{{item}}
18     loop:
19       - 11
20       - 12
21       - 13
22       - 14
23     ignore_errors: True
24     failed_when: false
25
26 - name: delete loopback {{subnet_id}}
27   cisco.ios.ios_interfaces:
28     name: Loopback{{subnet_id}}
29     enabled: True
30     state: absent
31     ignore_errors: True
32     failed_when: false
```

**Terminal**

```
developer:src > mkdir group_vars
developer:src > |
```

1. mkdir group\_vars 입력

# 미션 Setup

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```
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  tasks:
  - name: delete ACL via CLI
    cisco.ios.ios_config:
      lines:
        - no ip access-list extended my_acl
      ignore_errors: True
      failed_when: false
```

02-lab\_cleanup.yml

```
13
14 - name: delete ntp servers 10.1.{{subnet_id}}.{{item}} via
15   cisco.ios.ios_config:
```

2. Src 폴더의 새로고침 버튼 눌러서 group\_vars 폴더 생겼는지 확인

Before:

After :



# 미션 Setup

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```
Ansible IOS native modules

tasks:
- name: delete ACL via CLI
  cisco.ios.ios_config:
    lines:
      - no ip access-list extended my_acl
    ignore_errors: True
    failed_when: false

- name: delete ntp servers 10.1.{{subnet_id}}.{{item}} via CLI
  cisco.ios.ios_config:
    lines:
      - no ntp server 10.1.{{subnet_id}}.{{item}}
    loop:
      - 11
      - 12
      - 13
      - 14
    ignore_errors: True
    failed_when: false

- name: delete loopback {{subnet_id}}
  cisco.ios.ios_interfaces:
    name: Loopback{{subnet_id}}
    enabled: True
    state: absent
    ignore_errors: True
    failed_when: false

ansible-playbook -i hosts 02-lab_cleanup.yml
```

Congratulations, you have completed the Ansible IOS modules Learning Lab.

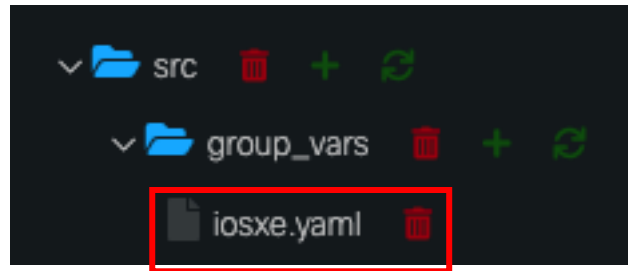
```
Search ...

> .cache
> .local
> src
  > group_vars
    iosxe.yaml
  02-create_loopback.yaml
  02-create_ntp_adj.yaml
  02-lab_cleanup.yaml
  ansible.cfg
  buildcheck.bat
  Caddyfile
  conf.sh
  hosts
  mission01.yaml
  requirements.txt
  vpn.sh
  .bash_logout
  .bashrc
  .profile

Terminal x +
developer:src > []
```

3. groups\_vars 폴더에 + 눌러서 iosxe.yaml 파일 만들기

After:



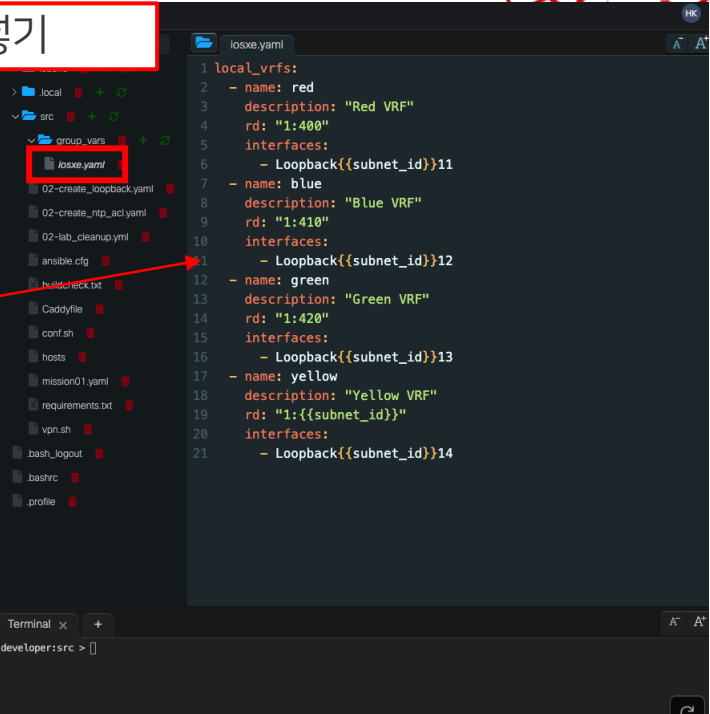
# 미션 Setup

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## 4. iosxe.yaml 파일에 내용 붙여넣기

### iosxe.yaml

```
local_vrfs:
  - name: red
    description: "Red VRF"
    rd: "1:400"
    interfaces:
      - Loopback{{subnet_id}}11
  - name: blue
    description: "Blue VRF"
    rd: "1:410"
    interfaces:
      - Loopback{{subnet_id}}12
  - name: green
    description: "Green VRF"
    rd: "1:420"
    interfaces:
      - Loopback{{subnet_id}}13
  - name: yellow
    description: "Yellow VRF"
    rd: "1:{{subnet_id}}"
    interfaces:
      - Loopback{{subnet_id}}14
```



```
1 local_vrfs:
2   - name: red
3     description: "Red VRF"
4     rd: "1:400"
5     interfaces:
6       - Loopback{{subnet_id}}11
7   - name: blue
8     description: "Blue VRF"
9     rd: "1:410"
10    interfaces:
11      - Loopback{{subnet_id}}12
12   - name: green
13     description: "Green VRF"
14     rd: "1:420"
15     interfaces:
16       - Loopback{{subnet_id}}13
17   - name: yellow
18     description: "Yellow VRF"
19     rd: "1:{{subnet_id}}"
20     interfaces:
21       - Loopback{{subnet_id}}14
```

# 미션 Setup

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Ansible IOS native modules

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configuration out to those devices. We've contrasted CLI-based approaches with more declarative modules. When reviewing the playbooks, we saw that each task is laid out in a human-readable manner, making ongoing support of the playbooks much easier even for people not familiar with Ansible or even IOS CLI.

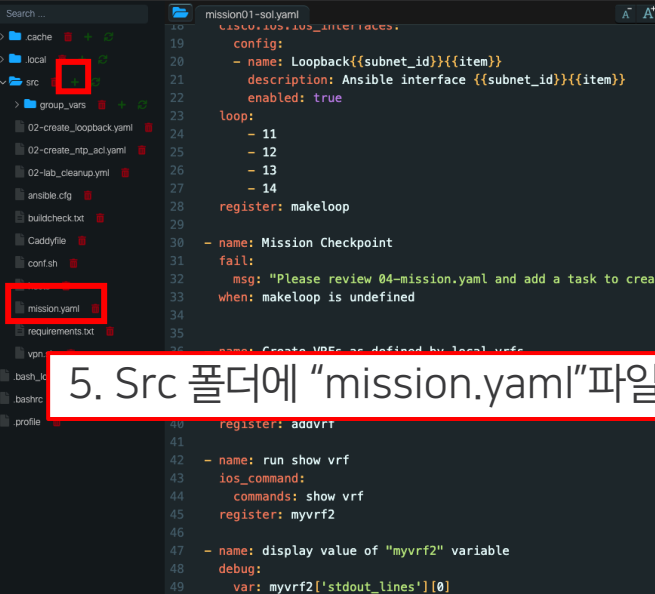
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  gather_facts: no

  tasks:
    - name: delete ACL via CLI
      cisco.ios.ios_config:
        lines:
          - no ip access-list extended my_acl
        ignore_errors: True
        failed_when: false

    - name: delete ntp servers 10.1.{{subnet_id}}.{{item}} via CLI
      cisco.ios.ios_config:
        lines:
          - no ntp server 10.1.{{subnet_id}}.{{item}}
        loop:
          - 11
          - 12
          - 13
          - 14
```



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```

# 미션 Setup

MISSION

## 4. mission.yaml 파일에 내용 붙여넣기

### mission.yaml

```
- name: Introduction to IOS XE Configuration Management with Ansible - Mission
hosts: iosxe
gather_facts: no

tasks:
  - name: run show vrf
    cisco.ios.ios_command:
      commands: show vrf
      register: myvrf1

  - name: display value of "myvrf1" variable
    debug:
      var: myvrf1["stdout_lines"][0]

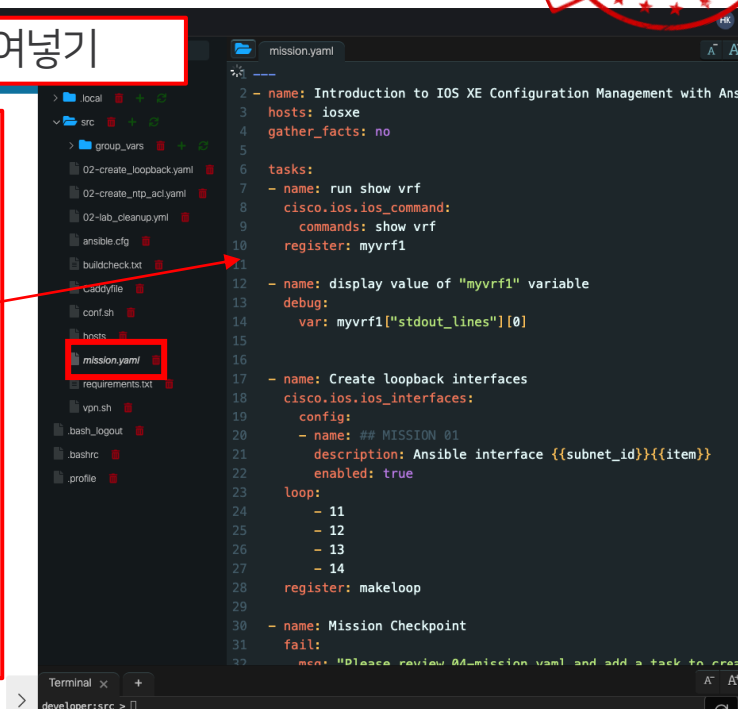
- name: Create loopback interfaces
  cisco.ios.ios_interfaces:
    config:
      - name: ## MISSION 01
        description: Ansible interface {{subnet_id}}{{item}}
        enabled: true
    loop:
      - 11
      - 12
      - 13
      - 14
    register: makeloop

- name: Mission Checkpoint
  fail:
    msg: "Please review 04-mission.yaml and add a task to create the required Loopbacks with unique numbers"
  when: makeloop is undefined

- name: Create VRFs as defined by local_vrfs
  ios_vrf:
    vrfs: "{{(local_vrfs)}}"
    state: present
    register: addvrf

- name: run show vrf
  ## MISSION 02

- name: display value of "myvrf2" variable
  ## MISSION 03
```



# 미션 내용



## 미션 #1

인터페이스 이름을

Loopback + hosts 파일의 변수 subnet\_id + loop값 으로!

예시 ) hosts파일 내의 subnet\_id = 11 이라 했을 때,

Loopback1111, Loopback1112, Loopback1113, Loopback 1114

```
- name: Create loopback interfaces
  cisco.ios.ios_interfaces:
    config:
      - name: ## MISSION 01
        description: Ansible interface {{subnet_id}}{{item}}
        enabled: true
    loop:
      - 11
      - 12
      - 13
      - 14
  register: makeloop
```

## MISSION 01을 지우고  
채워주세요!

## 미션 #2

1) 'show vrf' 커맨드를 실행하고,

2) myvrf2 라는 변수에 저장해서 보여주기

```
- name: run show vrf
  ## MISSION 02

- name: display value of "myvrf2" variable
  ## MISSION 02
```

## MISSION 02를 지우고  
채워주세요!

## Hint :

'show ntp associations' 커맨드를 실행하고 myntp변수에 저장하는 방법

```
- name: run show ntp associations
  cisco.ios.ios_command:
    commands: show ntp associations
    register: myntp

- name: display value of "myntp" variable
  debug:
    var: myntp["stdout_lines"][0]
```

# 미션 정답



## 미션 #1

```
- name: Create loopback interfaces
  cisco.ios.ios_interfaces:
    config:
      - name: ## MISSION 01
        description: Ansible interface {{subnet_id}}{{item}}
        enabled: true
    loop:
      - 11
      - 12
      - 13
      - 14
  register: makeloop
```

```
- name: Create loopback interfaces
  cisco.ios.ios_interfaces:
    config:
      - name: Loopback{{subnet_id}}{{item}}
        description: Ansible interface {{subnet_id}}{{item}}
        enabled: true
    loop:
      - 11
      - 12
      - 13
      - 14
  register: makeloop
```

정답

## 미션 #2

- 1) 'show vrf' 커맨드를 실행하고,
- 2) myvrf2 라는 변수에 저장해서 보여주기

```
- name: run show vrf
  ## MISSION 02

- name: display value of "myvrf2" variable
  ## MISSION 02
```

```
- name: run show vrf
  ios_command:
    commands: show vrf
    register: myvrf2

- name: display value of "myvrf2" variable
  debug:
    var: myvrf2['stdout_lines'][0]
```

정답

## 미션#2 정답

### ansible-playbook -i hosts mission.yaml

했을때, 오른쪽 화면과 같이 나온다면 성공

이유:

Lo + 1 (hosts 파일 안의 subnet\_id) + 11 =  
Lo111

Lo + 1 (hosts 파일 안의 subnet\_id) + 12 =  
Lo112 ...

```
PLAY [Introduction to IOS XE Configuration Management with Ansible - Mission] *****

TASK [run show vrf] *****
ok: [198.18.133.100]
ok: [198.18.133.110]

TASK [display value of "myvrf1" variable] *****
ok: [198.18.133.110] => {
  "myvrf1[\"stdout_lines\"] [0]": {
    "Name": "blue", "Default RD": 1:410, "Protocols": "Interfaces",
    "green": 1:420, "Lo112",
    "red": 1:400, "Lo113",
    "yellow": 1:1, "Lo111",
    "Lo114"
  }
}
ok: [198.18.133.100] => {
  "myvrf1[\"stdout_lines\"] [0]": {
    "Name": "blue", "Default RD": 1:410, "Protocols": "Interfaces",
    "green": 1:420, "Lo112",
    "red": 1:400, "Lo113",
    "yellow": 1:1, "Lo111",
    "Lo114"
  }
}

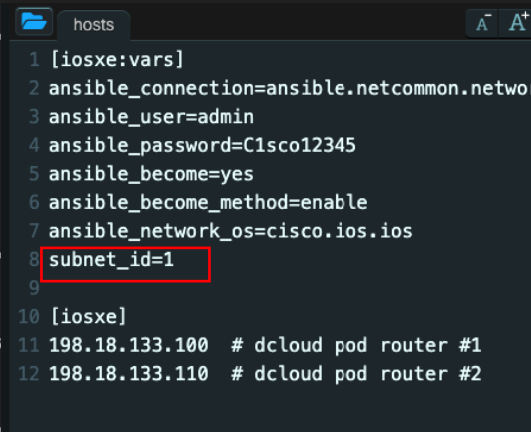
TASK [Create loopback interfaces] *****
ok: [198.18.133.110] => (item=11)
ok: [198.18.133.100] => (item=11)
ok: [198.18.133.110] => (item=12)
ok: [198.18.133.100] => (item=12)
ok: [198.18.133.110] => (item=13)
ok: [198.18.133.100] => (item=13)
ok: [198.18.133.110] => (item=14)
ok: [198.18.133.100] => (item=14)

TASK [Mission Checkpoint] *****
skipping: [198.18.133.100]
skipping: [198.18.133.110]

TASK [Create VRFs as defined by local_vrfs] *****
ok: [198.18.133.110]
ok: [198.18.133.100]

TASK [run show vrf] *****
ok: [198.18.133.100]
ok: [198.18.133.110]

TASK [display value of "myvrf2" variable] *****
ok: [198.18.133.110] => {
```



```
1 [iosxe:vars]
2 ansible_connection=ansible.netcommon.netwo
3 ansible_user=admin
4 ansible_password=Cisco12345
5 ansible_become=yes
6 ansible_become_method=enable
7 ansible_network_os=cisco.ios.ios
8 subnet_id=1
9
10 [iosxe]
11 198.18.133.100 # dcloud pod router #1
12 198.18.133.110 # dcloud pod router #2
```



Thank you

