ANSIBLE

Vagrant

Vagrant

- 2010.03 Mitchell Hashimoto, Opensource Project → HashiCorp
- Ruby로 개발되었으며 Linux, FreeBDS, OSX, Windows 지원
- 가상화 인스턴스 관리 SW → Provisioning
  - VirtualBox (기본 프로바이더)
  - VMware
  - KVM
  - Linux Container(LXC)
  - Docker
  - AWS
  - Azure

Vagrant

- ***Provisioning***

  - 사용자의 요구에 맞게 시스템 자원을 할당, 배치, 배포한 다음 필요 시 시스템을 즉시 사용할 수 있는 상태로 미리 준비

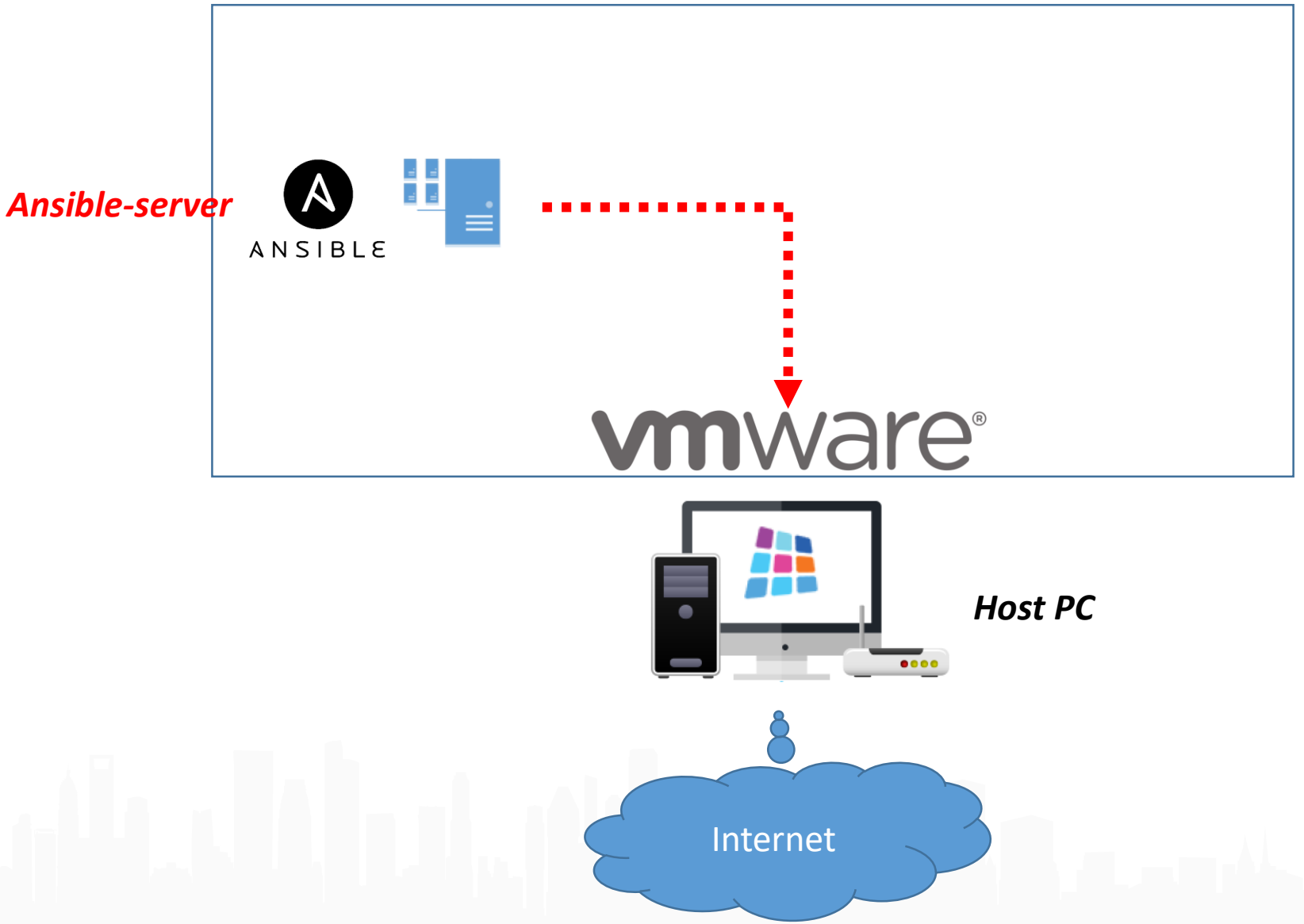
- Hostname:
  - ansible-server
  - ansible-node01, node02
- IP
  - 172.20.10.10
  - 172.20.10.11
  - 172.20.10.12

- Hostname:
  - ansible-node03
- IP
  - 172.20.10.13

- Hostname:
  - ansible-node04
- IP
  - 172.20.10.14

Vagrant

실습 환경의 구성



Vagrant

- *Vagrant 동작*
  1) *Box 이미지 다운로드*
  2) *Box 이미지를 이용하여 프로젝트 생성*
  3) *프로젝트 최상위 디렉토리에 위치한 Vagrantfile 파일 수정*
  4) *프로젝트의 가상 인스턴스 시작*
  5) *가상 이미지 접속 및 작업*
  6) *가상 이미지 종료*

- *Box 이미지*
  - *Box 파일 조회*
    - https://app.vagrantup.com/boxes/search

Vagrant

Vagrant 명령어

- vagrant -v
- vagrant status
- vagrant global-status
- vagrant init → Provisioning 하는 스크립트 생성
- vagrant up → Vagrantfile을 읽어 Provisioning 진행
- vagrant halt → Host 종료
- vagrant destroy → Host 삭제
- vagrant suspend
- vagrant resume
- vagrant reload
- vagrant ssh → Host 접속
- vagrant provision → Host 설정 변경 적용

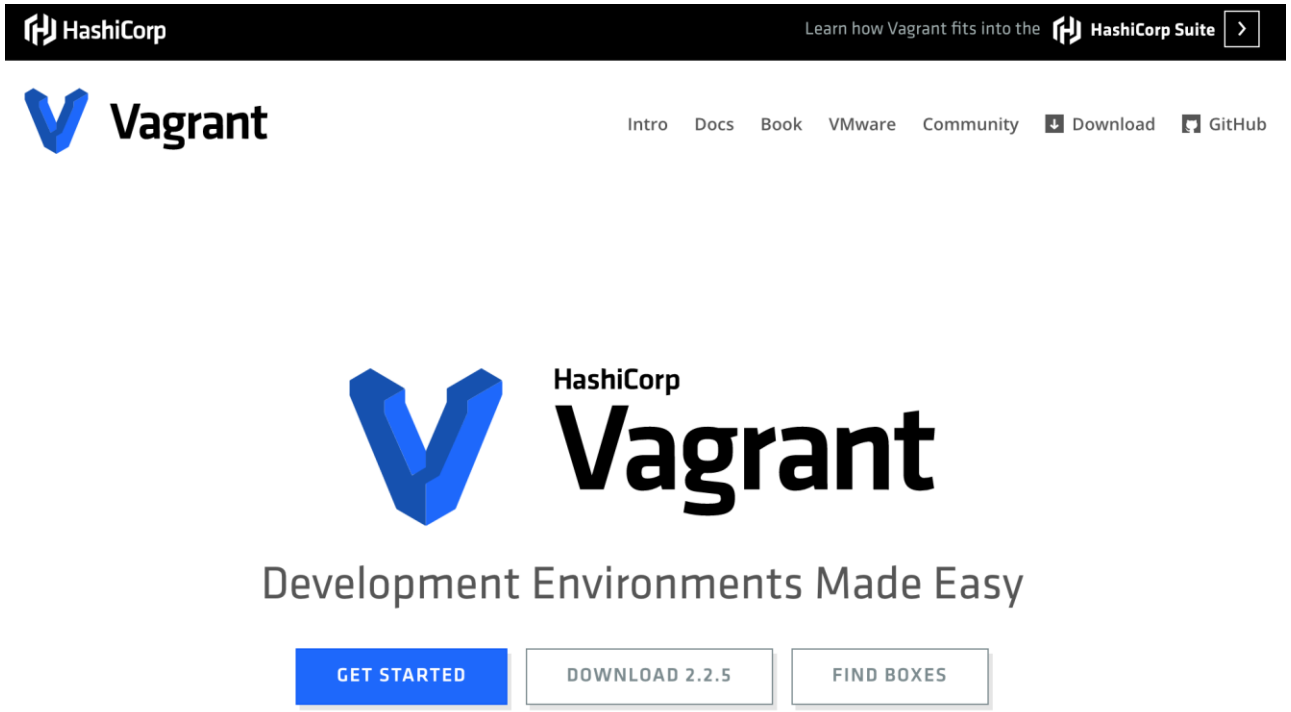
Vagrant

- ***Editor 설치***

  - Visual Studio Code or Notepad++ …

- ***Vagrant 설치***

  - https://www.vagrantup.com/



Vagrant

- ***Box 다운로드***
  - ***$ mkdir ~/Work***
  - ***$ cd ~/Work***
  - ***$ vagrant init***

```
 dowon@DOWON-MacBook  ~/Desktop/Work/vagrant  vagrant init
A `Vagrantfile` has been placed in this directory. You are now
ready to `vagrant up` your first virtual environment! Please read
the comments in the Vagrantfile as well as documentation on
`vagrantup.com` for more information on using Vagrant.
 dowon@DOWON-MacBook  ~/Desktop/Work/vagrant
```

- ***Vagrantfile 수정***
  - ***Ruby 언어로 작성***
  - https://app.vagrantup.com/boxes/search 에서 사용할 이미지 검색

Vagrant

Vagrantfile 수정

- ***15 line***

```
13  # Every Vagrant development environment requires a box. You can search for
14  # boxes at https://vagrantcloud.com/search.
15  config.vm.box = "base"
```

centos / 7 Vagrant box

How to use this box with Vagrant:

Vagrantfile | New

```
Vagrant.configure("2") do |config|
  config.vm.box = "centos/7"
end
```

Vagrant

- ***Vagrant plugin 설치***
  - ***$*** vagrant plugin install vagrant-vbguest → VirtualBox
  - ***$*** vagrant plugin install vagrant-vmware-desktop → VMware

  - ***ex) $*** vagrant plugin install vagrant-vmware-desktop → VMware ***→ license 필요***

```
 ✘ dowon@DOWON-MacBook  ~/Desktop/Work/vagrant  vagrant plugin install vagrant-vmware-desktop
Installing the 'vagrant-vmware-desktop' plugin. This can take a few minutes...
Fetching: vagrant-vmware-desktop-2.0.3.gem (100%)
Installed the plugin 'vagrant-vmware-desktop (2.0.3)'!
 dowon@DOWON-MacBook  ~/Desktop/Work/vagrant  vagrant plugin list
vagrant-vmware-desktop (2.0.3, global)
 dowon@DOWON-MacBook  ~/Desktop/Work/vagrant  vagrant
A valid license is required to run the Vagrant VMware
provider. Please visit http://www.vagrantup.com to purchase
a license. Once you purchase a license, you can install it
using `vagrant plugin license`.
```

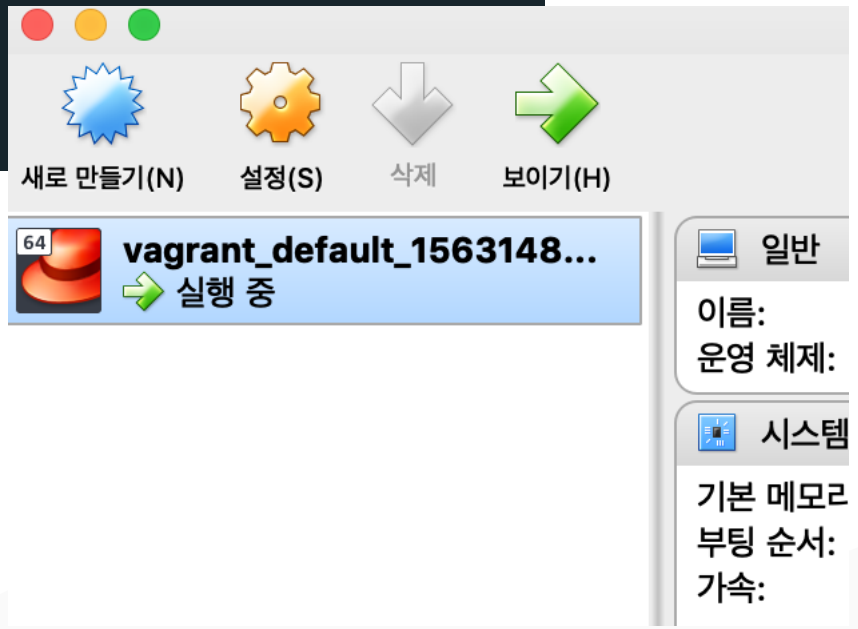
Vagrant

- ***Vagrant up***
  - ***$ vagrant up***

```
VirtualBox Guest Additions: Look at /var/log/vboxadd-setup.log to find out what went wrong
VirtualBox Guest Additions: Starting.
Redirecting to /bin/systemctl start vboxadd.service
Redirecting to /bin/systemctl start vboxadd-service.service
Unmounting Virtualbox Guest Additions ISO from: /mnt
==> default: Checking for guest additions in VM...
==> default: Rsyncing folder: /Users/dowon/Desktop/Work/vagrant/ => /vagrant
 dowon@DOWON-MacBook  ~/Desktop/Work/vagrant
```

```
 ✘ dowon@DOWON-MacBook  ~/Desktop/Work/vagrant  vagrant up
Bringing machine 'default' up with 'virtualbox' provider...
==> default: Box 'centos/7' could not be found. Attempting to find and install...
    default: Box Provider: virtualbox
    default: Box Version: >= 0
==> default: Loading metadata for box 'centos/7'
    default: URL: https://vagrantcloud.com/centos/7
==> default: Adding box 'centos/7' (v1905.1) for provider: virtualbox
```

  - ***VirtualBox에서 확인***



Vagrant

- ***Vagrant up***
  - ***$ varant ssh***
  - ***Ansible은 미설치***

- ***Vagrantfile 수정***

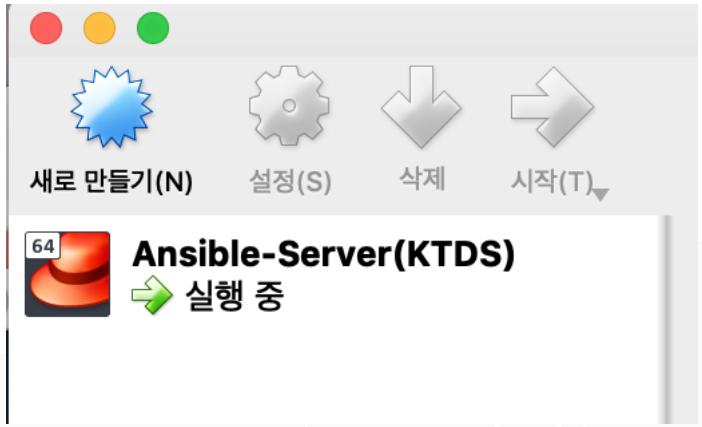
```
 8  Vagrant.configure("2") do |config|
 9    config.vm.define:"ansible-server" do |cfg|
10      cfg.vm.box = "centos/7"
11      cfg.vm.provider:virtualbox do |vb|
12        vb.name="Ansible-Server(KTDS)"
13      end
14      cfg.vm.host_name="ansible-server"
15      cfg.vm.synced_folder ".", "/vagrant", disabled: true
16      cfg.vm.network "public_network", ip: "172.20.10.10"
17      cfg.vm.network "forwarded_port", guest: 22, host: 19210, auto_correct:
        false, id: "ssh"
18      cfg.vm.provision "shell", path: "bootstrap.sh"
19    end
20  end
```

Vagrant

- *bootstrap.sh 파일 생성*
  - *Vargrant script 파일*

```
1  #! /usr/bin/env bash
2
3  yum install epel-release -y
4  yum install ansible -y
```

- *Vagrant up*
  - *기존 VM 이미지 삭제 후 재 실행*



Vagrant

- ***Vagrant ssh***
  - ***$ vargant ssh ansible-server***
  - ***[vagrant@ansible-server]$ ansible***

```
 dowon@DOWON-MacBook  ~/Desktop/Work/vagrant/ansible/01.centos  vagrant ssh ansible-server
[vagrant@ansible-server ~]$
[vagrant@ansible-server ~]$
[vagrant@ansible-server ~]$
[vagrant@ansible-server ~]$ ansible
usage: ansible [-h] [--version] [-v] [-b] [--become-method BECOME_METHOD]
               [--become-user BECOME_USER] [-K] [-i INVENTORY] [--list-hosts]
               [-l SUBSET] [-P POLL_INTERVAL] [-B SECONDS] [-o] [-t TREE] [-k]
               [--private-key PRIVATE_KEY_FILE] [-u REMOTE_USER]
               [-c CONNECTION] [-T TIMEOUT]
               [--ssh-common-args SSH_COMMON_ARGS]
               [--sftp-extra-args SFTP_EXTRA_ARGS]
               [--scp-extra-args SCP_EXTRA_ARGS]
               [--ssh-extra-args SSH_EXTRA_ARGS] [-C] [--syntax-check] [-D]
               [-e EXTRA_VARS] [--vault-id VAULT_IDS]
               [--ask-vault-pass | --vault-password-file VAULT_PASSWORD_FILES]
               [-f FORKS] [-M MODULE_PATH] [--playbook-dir BASEDIR]
               [-a MODULE_ARGS] [-m MODULE_NAME]
               pattern
ansible: error: too few arguments
[vagrant@ansible-server ~]$
```

Playbook

- *Vagrantfile 수정*
  - *Ansible_env_ready.yml 파일 실행 추가*
- *bootstrap.sh 파일 수정*
  - *vim plugin 관련 파일이 저장될 디렉토리 생성*
  - *vim과 bash 환경 설정 파일 생성*
- *Ansible_env_ready.yml 파일*
  - *yum을 통해 vim-enhanced 설리*
  - *yum을 통해 git 설치*
  - *pathogen.vim 다운로드*
  - *vim-ansible-yaml 다운로드 (git clone)*
  - *vim의 환경 설정 파일 수정 (.vimrc)*
  - *bash의 환경 설정 파일 수정 (.bashrc)*

Playbook

- *Vagrantfile 파일 실행*
  - *$ vagrant destroy ansible-server*
  - *$ vagrant up (or $ vagrant provision ansible-server)*

```
ansible-server: TASK [Configure vimrc] ************************************************************
ansible-server: ok: [localhost] => (item=set number)
ansible-server: ok: [localhost] => (item=execute pathogen#infect())
ansible-server: ok: [localhost] => (item=syntax on)
ansible-server:
ansible-server: TASK [Configure Bashrc] ************************************************************
ansible-server: ok: [localhost] => (item=alias vi='vim')
ansible-server: ok: [localhost] => (item=alias ans='ansible')
ansible-server: changed: [localhost] => (item=alias anp='ansible-playbook')
ansible-server:
ansible-server: PLAY RECAP *************************************************************************
```

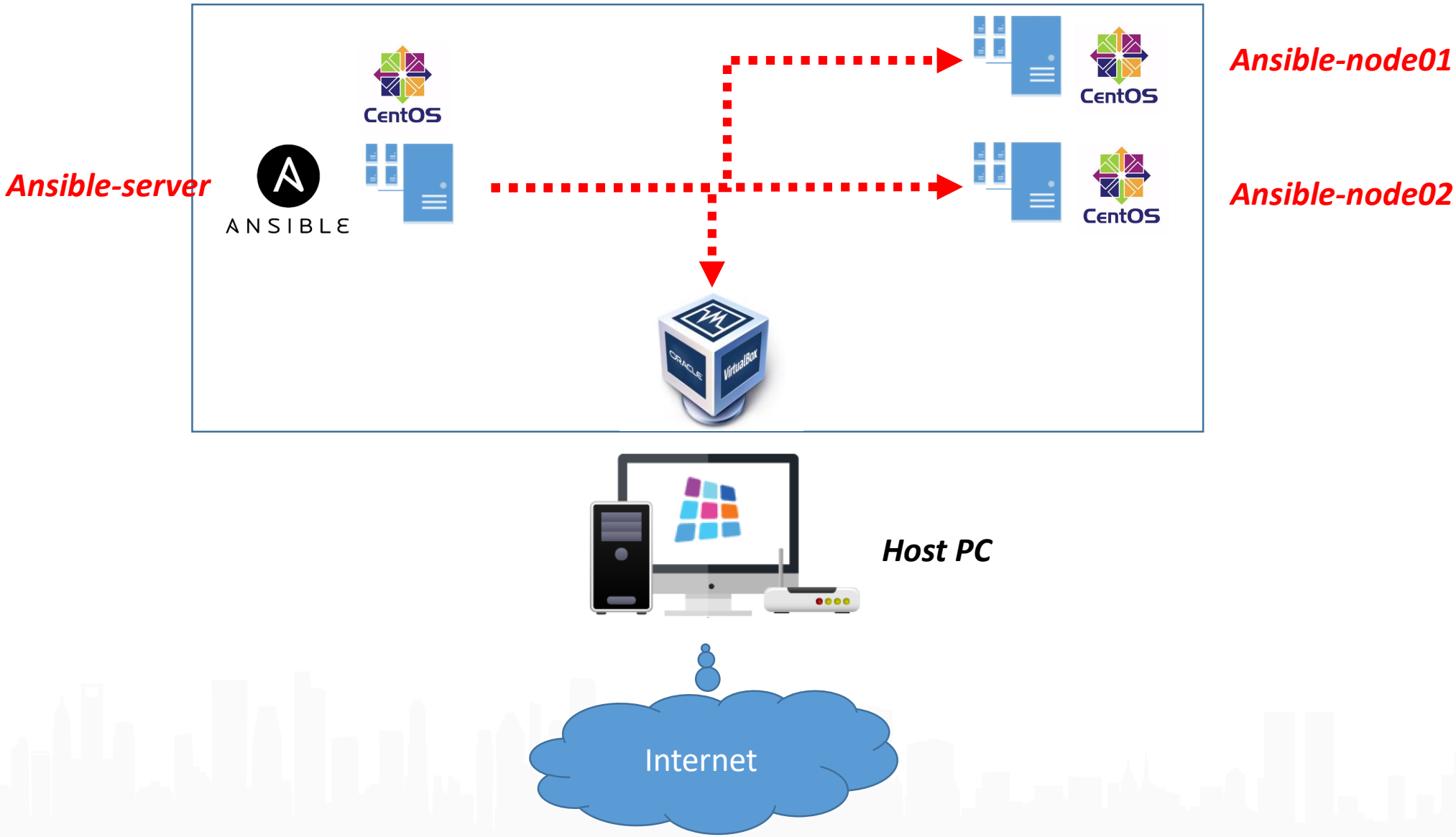
  - *$ vagrant ssh ansible-server*
  - *[vagrant@ansible-server]$ ls*
  - *[vagrant@ansible-server]$ ans*
  - *[vagrant@ansible-server]$ anp*

Ansible Node 추가

- 다양한 os 지원
  - CentOS
  - ubuntu
  - Windows

Ansible Node 추가

- 실습 환경의 구성



Ansible Node 추가

- Vagrantfile 추가
  1) Ansible Node 2개 추가 (CentOS)
  2) 구성 파일 작성
     - Vagrant Host 이름 작성
     - VirutalBox 설정 변경
       - VirtualBox에서 구분하는 Host 이름 작성
       - CPU와 메모리 크기 변경
     - 가상머신의 Host 이름 변경
     - 공유 디렉토리 사용하지 않음
     - 인터넷에 연결되는 IP 설정
     - Host PC의 포트 변경 (port forwarding)
     - Ansible Server에서 add_ssh_auth.sh 파일 실행 (vagrant 유저)

Ansible Node 추가

- add_ssh_auth.sh 파일 추가
  - sshpass를 이용해 Ansible Server에 Ansible Node의 ssh_key를 등록

- Ansible_env_ready.yml 파일 수정
  - /etc/hosts 서버와 노드 등록
  - /etc/ansible/hosts에 앤서블 통해 관리할 노드 등록
  - yum을 통해 앤서블 서버에 sshpass 설치

Ansible Node 추가

- *add_ssh_auth.sh 파일 추가*

```
#! /usr/bin/env bash

# ssh key 생성
sshpass -p vagrant ssh -T -o StrictHostKeyChecking=no vagrant@node01
sshpass -p vagrant ssh -T -o StrictHostKeyChecking=no vagrant@node02
```

- *Ansible_env_ready.yml 파일 수정*

```
  tasks:
    - name: Add "/etc/hosts"
      blockinfile: |
        dest=/etc/hosts
        content="
          172.20.10.10 server
          172.20.10.11 node01
          172.20.10.12 node02"
```

```
    - name: Add "/etc/ansible/hosts"
      blockinfile: |
        dest=/etc/ansible/hosts
        content="
          [CentOS]
          node01
          node02"

    - name: Install sshpass for Authentication
      yum:
        name: sshpass
        state: present

```

Ansible Node 추가

- *Vagrantfile 파일 수정*

```
# Ansible-Node01
config.vm.define:"ansible-node01" do |cfg|
  cfg.vm.box = "centos/7"
  cfg.vm.provider:virtualbox do |vb|
      vb.name="Ansible-Node01(KTDS)"
      vb.customize ["modifyvm", :id, "--cpus", 1]
      vb.customize ["modifyvm", :id, "--memory", 1024]
  end
  cfg.vm.host_name="ansible-node01"
  cfg.vm.synced_folder ".", "/vagrant", disabled: true
  cfg.vm.network "public_network", ip: "172.20.10.11"
  cfg.vm.network "forwarded_port", guest: 22, host: 19211, auto_correct: false, id: "ssh"
end

# Ansible-Node02
config.vm.define:"ansible-node02" do |cfg|
  cfg.vm.box = "centos/7"
  cfg.vm.provider:virtualbox do |vb|
      vb.name="Ansible-Node02(KTDS)"
      vb.customize ["modifyvm", :id, "--cpus", 1]
      vb.customize ["modifyvm", :id, "--memory", 1024]
  end
  cfg.vm.host_name="ansible-node02"
  cfg.vm.synced_folder ".", "/vagrant", disabled: true
  cfg.vm.network "public_network", ip: "172.20.10.12"
  cfg.vm.network "forwarded_port", guest: 22, host: 19212, auto_correct: false, id: "ssh"
end
```

Ansible Node 추가

- *$ vagrant destroy ansible-server*
- *$ vagrant up*
- *$ vagrant ssh ansible-server*
- *[vagrant@ansible-server]$ cat .ssh/known_hosts*
- *[vagrant@ansible-server]$ vi /etc/hosts*
- *[vagrant@ansible-server]$ vi /etc/ansible/hosts*
- *[vagrant@ansible-server]$ ans all –m ping -k*

```
[vagrant@ansible-server ~]$ ans all -m ping -k
SSH password:
node01 | UNREACHABLE! => {
    "changed": false,
    "msg": "Failed to connect to the host via ssh: Permission denied (publickey,gssapi-keyex,gssapi-with-mic).",
    "unreachable": true
}
node02 | UNREACHABLE! => {
    "changed": false,
    "msg": "Failed to connect to the host via ssh: Permission denied (publickey,gssapi-keyex,gssapi-with-mic).",
    "unreachable": true
}
```

Ansible Node 통신 문제

- *Ansible Server와 Ansible Node 간의 통신 문제*

```
[vagrant@ansible-server ~]$ ping node01
PING node01 (172.20.10.11) 56(84) bytes of data.
64 bytes from node01 (172.20.10.11): icmp_seq=1 ttl=64 time=0.425 ms
64 bytes from no
^C
--- node01 ping
2 packets transm
rtt min/avg/max/
[vagrant@ansible
Permission denie
```

```
[vagrant@ansible-server ~]$ ans all -m ping -k
SSH password:
node01 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "ping": "pong"
}
node02 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "ping": "pong"
}
```

nfig

SSH Server
sshd

o → yes

...

authrozied_keys

Ansible Node 통신 문제

- **Ansible Server → Ansible Playbook**

```
6   tasks:
7     - name: PasswordAuthentication change from no to yes
8       replace:
9         dest=/etc/ssh/sshd_config
10        regexp='PasswordAuthentication no'
11        replace='PasswordAuthentication yes'
12        backup=yes
13    - name: sshd restart to apply "PasswordAuthentication"
14      service:
15        name: sshd
16        state: restarted
```

- **Ansible Node → Bash Shell**

```
3   now=$(date +"%m_%d_%Y")
4   cp /etc/ssh/sshd_config /etc/ssh/sshd_config_$now.backup
5   sed -i -e 's/PasswordAuthentication no/PasswordAuthentication yes/g' /etc/ssh/sshd_config
6   systemctl restart sshd
```

Ansible Node 통신 문제

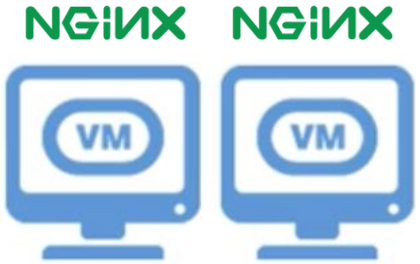
- *$ vagrant provision*

```
✘ dowon@DOWON-MacBook ~/Desktop/Work/vagrant vagrant provision
==> ansible-node01: Running provisioner: shell...
    ansible-node01: Running: /var/folders/l6/ywd_lbkx2z3618qtqx7902ph0000gn/T/vagrant-shell20190716-29009-b3gq9y.sh
    ansible-node01: date: extra operand ‘%m_%d_%Y’
    ansible-node01: Try 'date --help' for more information.
    ansible-node01: sed: -e expression #1, char 53: unknown option to `s'
==> ansible-node02: Running provisioner: shell...
    ansible-node02: Running: /var/folders/l6/ywd_lbkx2z3618qtqx7902ph0000gn/T/vagrant-shell20190716-29009-qdjvhy.sh
    ansible-node02: date: extra operand ‘%m_%d_%Y’
    ansible-node02: Try 'date --help' for more information.
    ansible-node02: sed: -e expression #1, char 53: unknown option to `s'
==> ansible-server: Running provisioner: shell...
    ansible-server: Running: /var/folders/l6/ywd_lbkx2z3618qtqx7902ph0000gn/T/vagrant-shell20190716-29009-1hu2xzy.sh
    ansible-server: Loaded plugins: fastestmirror
```

- *$ vagrant ssh ansible-server*

```
dowon@DOWON-MacBook ~/Desktop/Work/vagrant vagrant ssh ansible-server
[vagrant@ansible-server ~]$ sudo vi /etc/ssh/sshd_config
[vagrant@ansible-server ~]$
[vagrant@ansible-server ~]$
[vagrant@ansible-server ~]$ clear
[vagrant@ansible-server ~]$ ans all -m ping -k
SSH password:
node01 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "ping": "pong"
}
```

Nginx 배포 테스트



- 설치

- 파일 전송

- 서비스 재시작

- 삭제

Nginx 배포 테스트

- *$ vagrant ssh ansible-server*
- *[vagrant@ansible-server]$ vi nginx_install.yml*

```
- name: install nginx on CentOS
  hosts: CentOS
  gather_facts: no
  become: yes

  tasks:
    - name: install epel-release
      yum: name=epel-release state=latest
    - name: install nginx web server
      yum: name=nginx state=present
    - name: upload default index.html for web server
      get_url: url=https://www.nginx.com dest=/usr/share/nginx/html/ mode=0644
    - name: start nginx web server
      service: name=nginx state=started
```

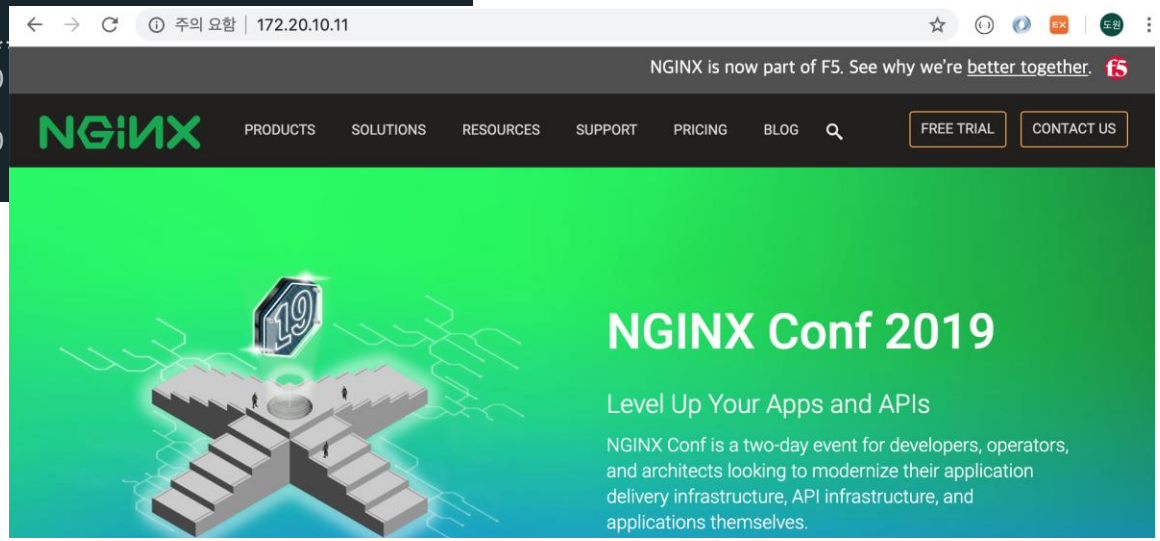
- *[vagrant@ansible-server]$ vi nginx_remove.yml*

```
- name: remove nginx on CentOS
  hosts: CentOS
  gather_facts: no
  become: yes

  tasks:
    - name: remove epel-release
      yum: name=epel-release state=absent
    - name: remove nginx web server
      yum: name=nginx state=absent
```

Nginx 배포 테스트

- *[vagrant@ansible-server]$ anp nginx_install.yml -k*

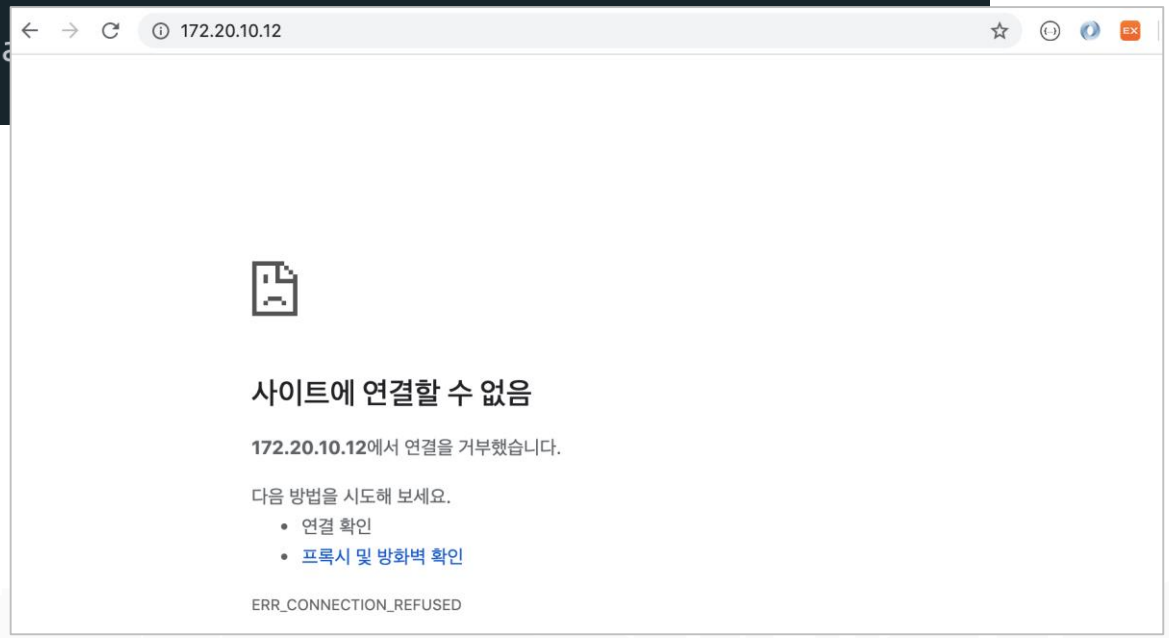
```
PLAY [install nginx on CentOS] ************************************************************

TASK [install epel-release] ***************************************************************
changed: [node01]
changed: [node02]

TASK [install nginx web server] ***********************************************************
changed: [node02]
changed: [node01]

TASK [upload default index.html for web server] *******************************************
changed: [node01]
changed: [node02]

TASK [start nginx web server] *************************************************************
changed: [node02]
changed: [node01]

PLAY RECAP ********************************************************************
node01                     : ok=4    changed=4    unreachable=0    failed=0
ignored=0
node02                     : ok=4    changed=4    unreachable=0    failed=0
ignored=0
```



Nginx 배포 테스트

- *[vagrant@ansible-server]$ anp nginx_remove.yml -k*

```
PLAY [remove nginx on CentOS] **************************************************

TASK [remove epel-release] *****************************************************
changed: [node01]
changed: [node02]

TASK [remove nginx web server] *************************************************
changed: [node01]
changed: [node02]

PLAY RECAP *********************************************************************
node01                     : ok=2    changed=2    unreachable=0    failed=0    skipped=0    rescued=0
ignored=0
node02                     : ok=2    changed=2    unreacha
ignored=0
```



시간대 변경

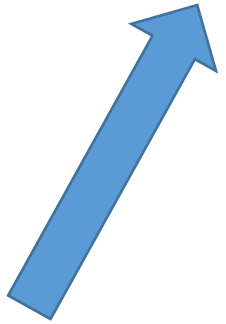
- *[vagrant@ansible-server]$ date*

```
[vagrant@ansible-server ~]$ date
2019. 07. 15. (월) 23:27:10 UTC
[vagrant@ansible-server ~]$
```

- *[vagrant@ansible-server]$ vi timezone.yml*

```
2  - name: setup timezone
3    hosts: CentOS
4    gather_facts: no
5    become: yes
6
7    tasks:
8      - name: set timezone to Asia/Seoul
9        timezone: name=Asia/Seoul
```

```
[vagrant@ansible-node01 ~]$ date
2019. 07. 16. (화) 08:32:10 KST
[vagrant@ansible-node01 ~]$
```

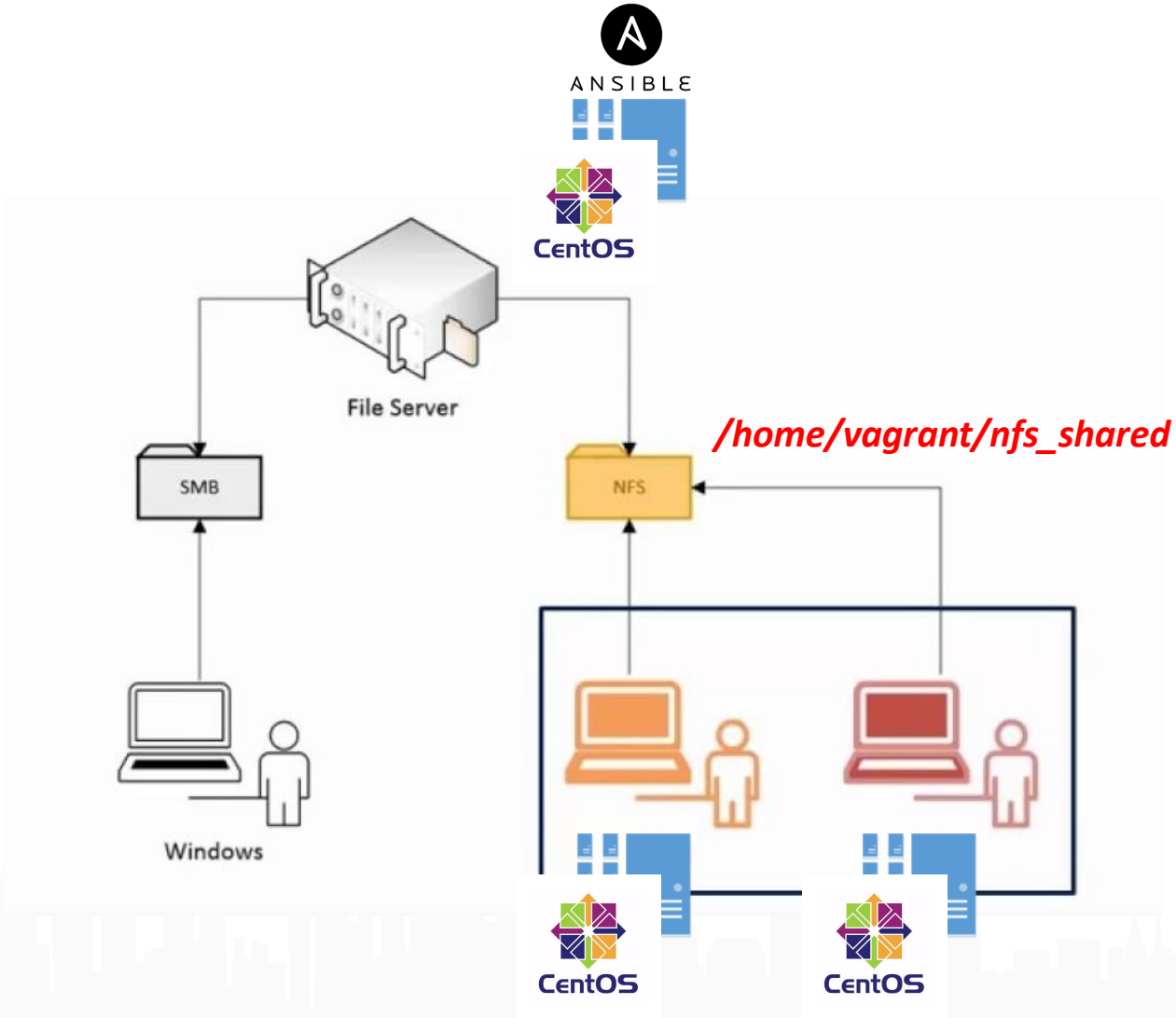


- *[vagrant@ansible-server]$ anp timezone.yml -k*

```
PLAY [setup timezone] **********************************************************************

TASK [set timezone to Asia/Seoul] **********************************************************
changed: [node01]
changed: [node02]

PLAY RECAP *********************************************************************************
node01                     : ok=1    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
node02                     : ok=1    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

NFS 서버, 클라이언트 테스트

- *Ansible Server → NFS 서버*
- *Ansible Nodes → NFS 클라이언트*



NFS 서버, 클라이언트 테스트

- *[vagrant@ansible-server]$ vi nfs.yml*
  - *NFS 서버*

```
6   tasks:
7     - name: make nfs_shared directory
8       file:
9         path: /home/vagrant/nfs_shared
10        state: directory
11        mode: 0777
12
13    - name: configure /etc/exports
14      become: yes
15      lineinfile:
16        path: /etc/exports
17        line: /home/vagrant/nfs_shared/ 172.20.10.0/24(rw,sync)
18
19    - name: nfs service restart
20      become: yes
21      service:
22        name: nfs
23        state: restarted
```

NFS 서버, 클라이언트 테스트

- *[vagrant@ansible-server]$ vi nfs_client.yml*
  - *NFS 클라이언트*

```
2  - name: setup for nfs clients
3    hosts: CentOS
4    gather_facts: no
5
6    tasks:
7      - name: make nfs_client directory
8        file:
9          path: /home/vagrant/nfs
10         state: directory
11
12     - name: mount point directory as client
13       become: yes
14       mount:
15         name: /home/vagrant/nfs
16         src: 172.20.10.10:/home/vagrant/nfs_shared
17         fstype: nfs
18         opts: nfsvers=3
19         state: mounted
```

NFS 서버, 클라이언트 테스트

- *[vagrant@ansible-server]$ cat /etc/exports*

```
[vagrant@ansible-server ~]$ cat /etc/exports
[vagrant@ansible-server ~]$ exportfs
exportfs: could not open /var/lib/nfs/.etab.lock for locking: errno 13 (Permission denied)
[vagrant@ansible-server ~]$
```

- *[vagrant@ansible-server]$ anp nfs.yml -k*

```
PLAY [setup for nfs server] ****************************************************************************

TASK [make nfs_shared directory] ***********************************************************************
changed: [localhost]

TASK [configure /etc/exports] **************************************************************************
changed: [localhost]

TASK [nfs service restart] *****************************************************************************
changed: [localhost]

PLAY [setup for nfs clients] ***************************************************************************

TASK [make nfs_client directory] ************************************************************************
changed: [node01]
changed: [node02]

TASK [mount point directory as client] *****************************************************************
changed: [node01]
changed: [node02]

PLAY RECAP *********************************************************************************************
localhost                  : ok=3    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
node01                     : ok=2    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
node02                     : ok=2    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

NFS 서버, 클라이언트 테스트

- *[vagrant@ansible-server]$ cat /etc/exports*

```
[vagrant@ansible-server ~]$ cat /etc/exports
/home/vagrant/nfs_shared/ 172.20.10.0/24(rw,sync)
```

- *New Terminal*
- *$ vagrant ssh ansible-node01*
- *[vagrant@ansible-node01]$ cd nfs*
- *[vagrant@ansible-node01]$ touch $HOSTNAME*

```
 dowon@DOWON-MacBook  ~/Desktop/Work/vagrant  vagrant ssh ansible-node01
Last login: Tue Jul 16 08:55:39 2019 from 172.20.10.10
[vagrant@ansible-node01 ~]$ ll
total 0
drwxrwxrwx. 2 vagrant vagrant 6  7월 16 08:55 nfs
[vagrant@ansible-node01 ~]$ cd nfs
[vagrant@ansible-node01 nfs]$ pwd
/home/vagrant/nfs
[vagrant@ansible-node01 nfs]$ touch $HOSTNAME
[vagrant@ansible-node01 nfs]$ ll
total 0
-rw-rw-r--. 1 vagrant vagrant 0  7월 16 09:00 ansible-node01
[vagrant@ansible-node01 nfs]$
```

NFS 서버, 클라이언트 테스트

- *[vagrant@ansible-server]$ cd nfs_shared*

```
[vagrant@ansible-server ~]$ cd nfs_shared/
[vagrant@ansible-server nfs_shared]$ ll
total 0
-rw-rw-r--. 1 vagrant vagrant 0  7월 16 00:00 ansible-node01
[vagrant@ansible-server nfs_shared]$
```