ANSIBLE

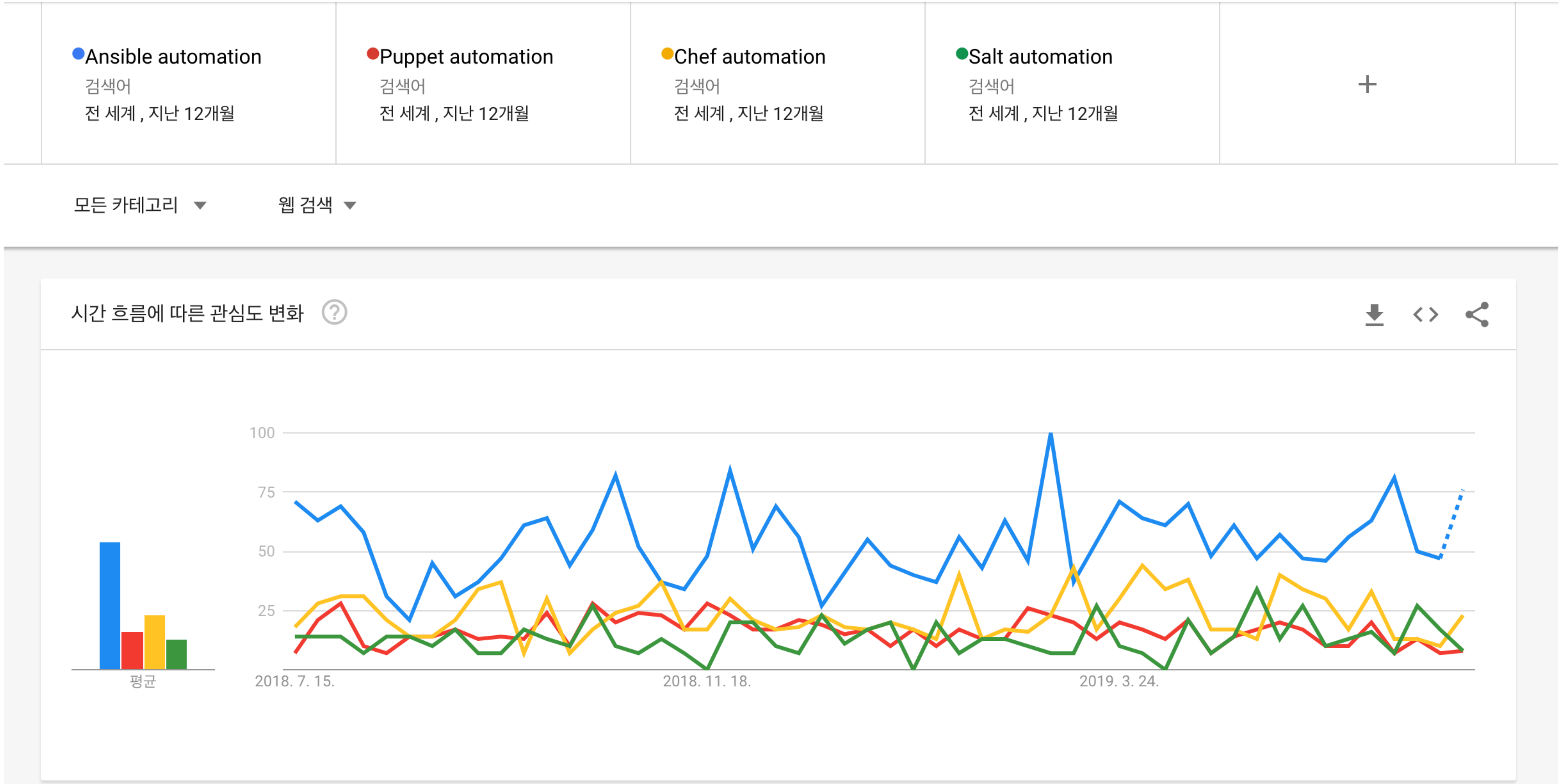
▪ *Ansible*

▪ *Configuration Management Tools*

	Puppet	Chef	Salt	Ansible
개발사	Puppet Labs	Opscode	SaltStack	AnsibleWorks
등장	2005.08	2009.01	2011.03	2012.03
개발언어	Ruby	Ruby, Erlang	Python	Python
주요고객	Google, ebay, Disney …	Facebook, Ancestry.com …	Linkedin, HP …	Evernotes, Raskspace …
Base	Puppet Forge	Chef Supermarket	Slag-Formula	Ansible Galaxy
Web UI	Puppet Enterprise	Chef Manage	SaltStack Enterprise	Ansible Tower
Definition File	자체 DSL, 내장 Ruby	자체 DSL (Ruby 베이스)	YAML, 자체 DSL (Python 베이스)	YAML
Agent	필요	필요	필요 or 불필요	불필요
사용률	★★★	★★★	★	★★★
사용성	★	★	★	★★★

Ansible

- ***Configuration Management Tools***



●Ansible automation
검색어
전 세계 , 지난 12개월

●Puppet automation
검색어
전 세계 , 지난 12개월

●Chef automation
검색어
전 세계 , 지난 12개월

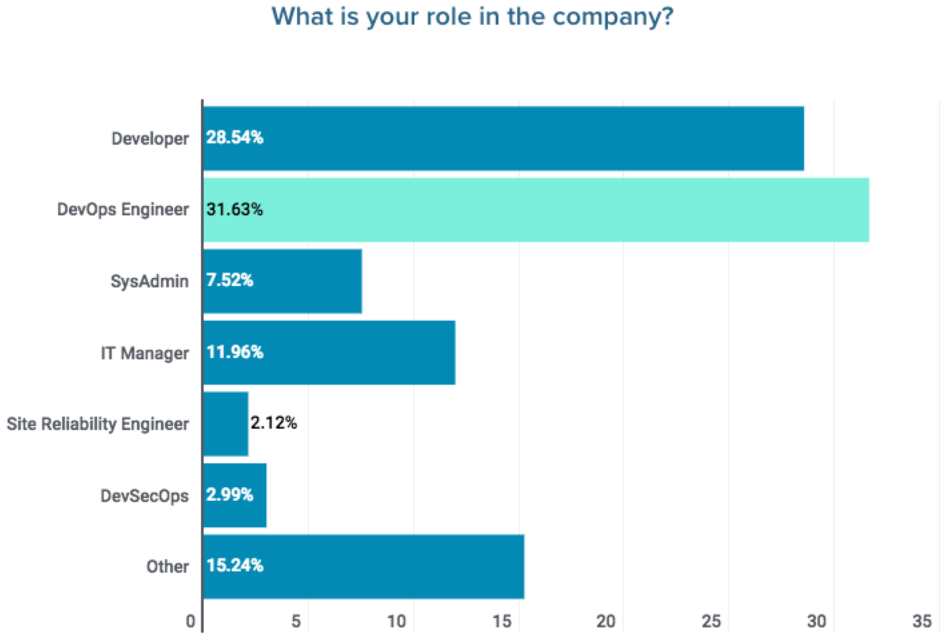
●Salt automation
검색어
전 세계 , 지난 12개월

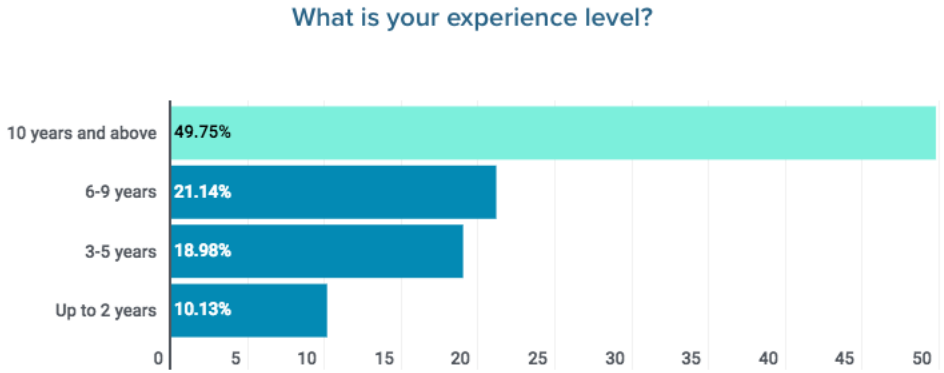
모든 카테고리 ▾ 웹 검색 ▾

시간 흐름에 따른 관심도 변화

Ansible

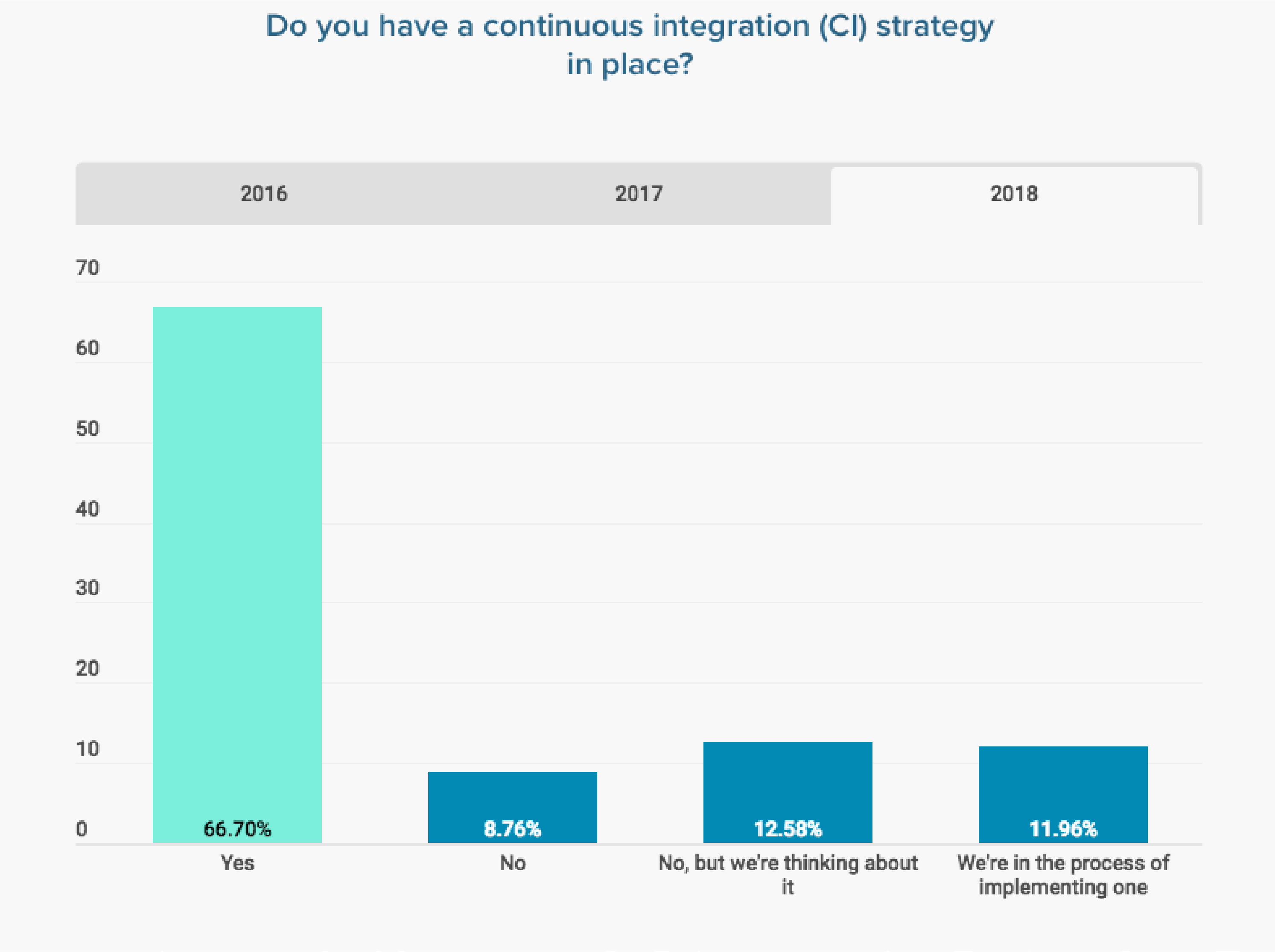
- ***Configuration Management Tools***





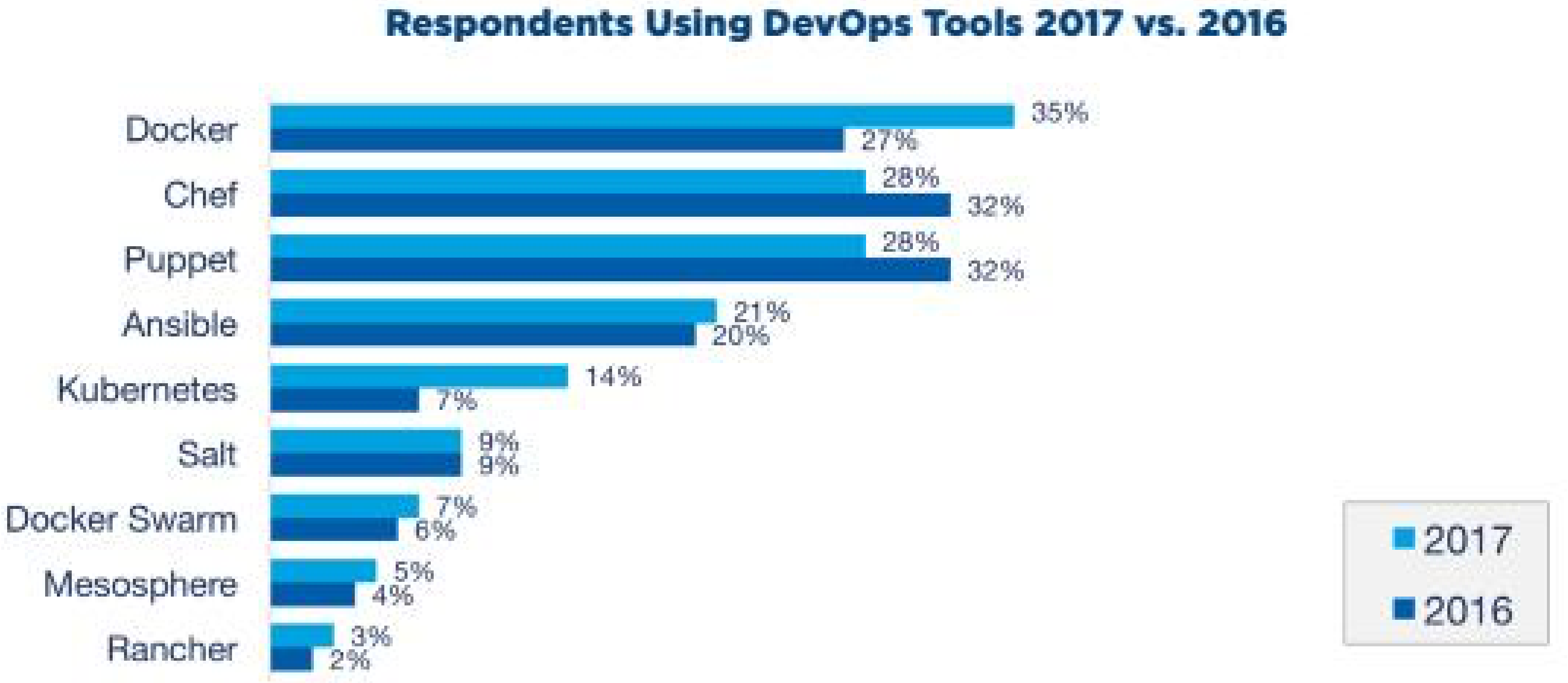
Ansible

- ***Configuration Management Tools***



Ansible

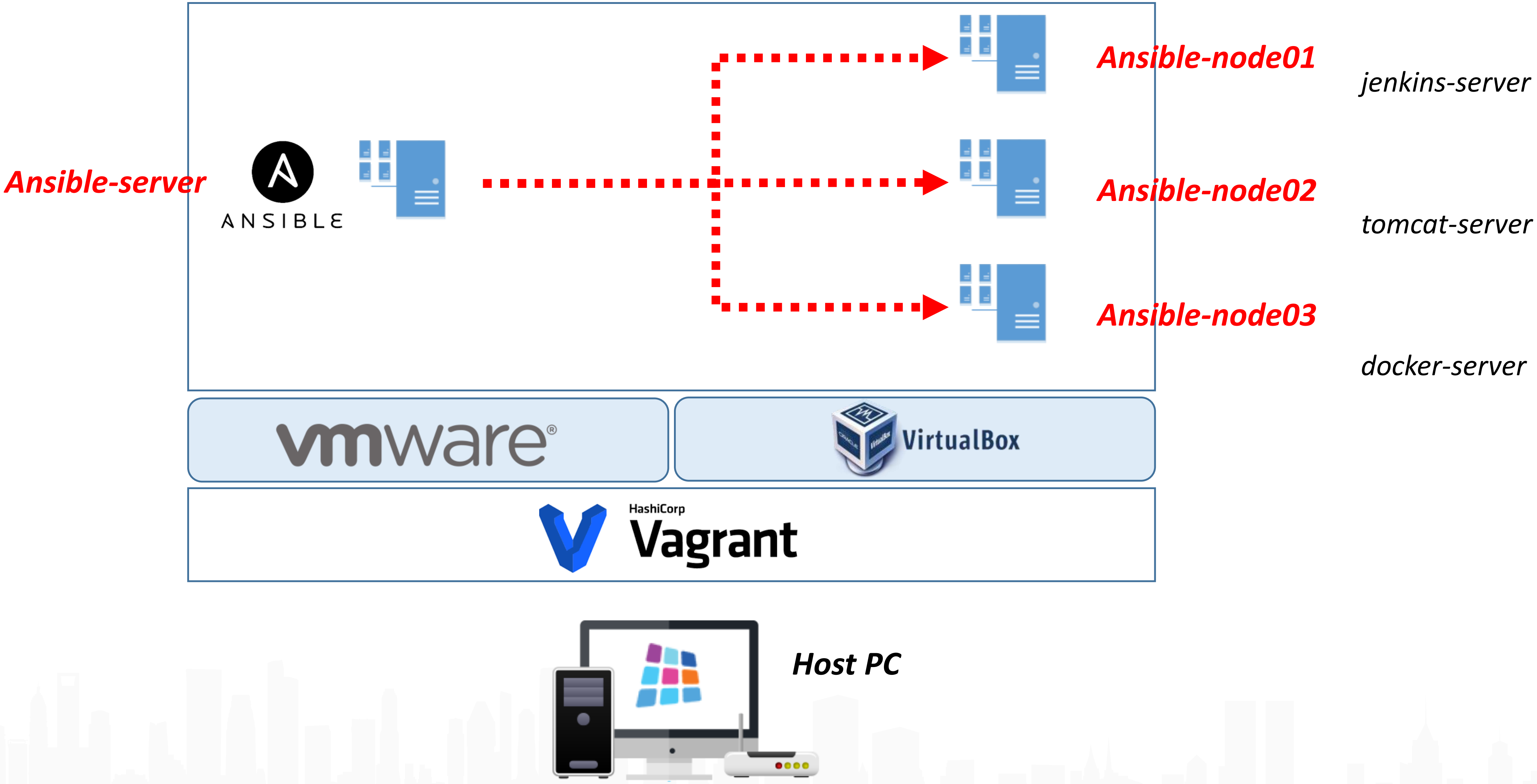
- ***Configuration Management Tools***



Source: RightScale 2017 State of the Cloud Report

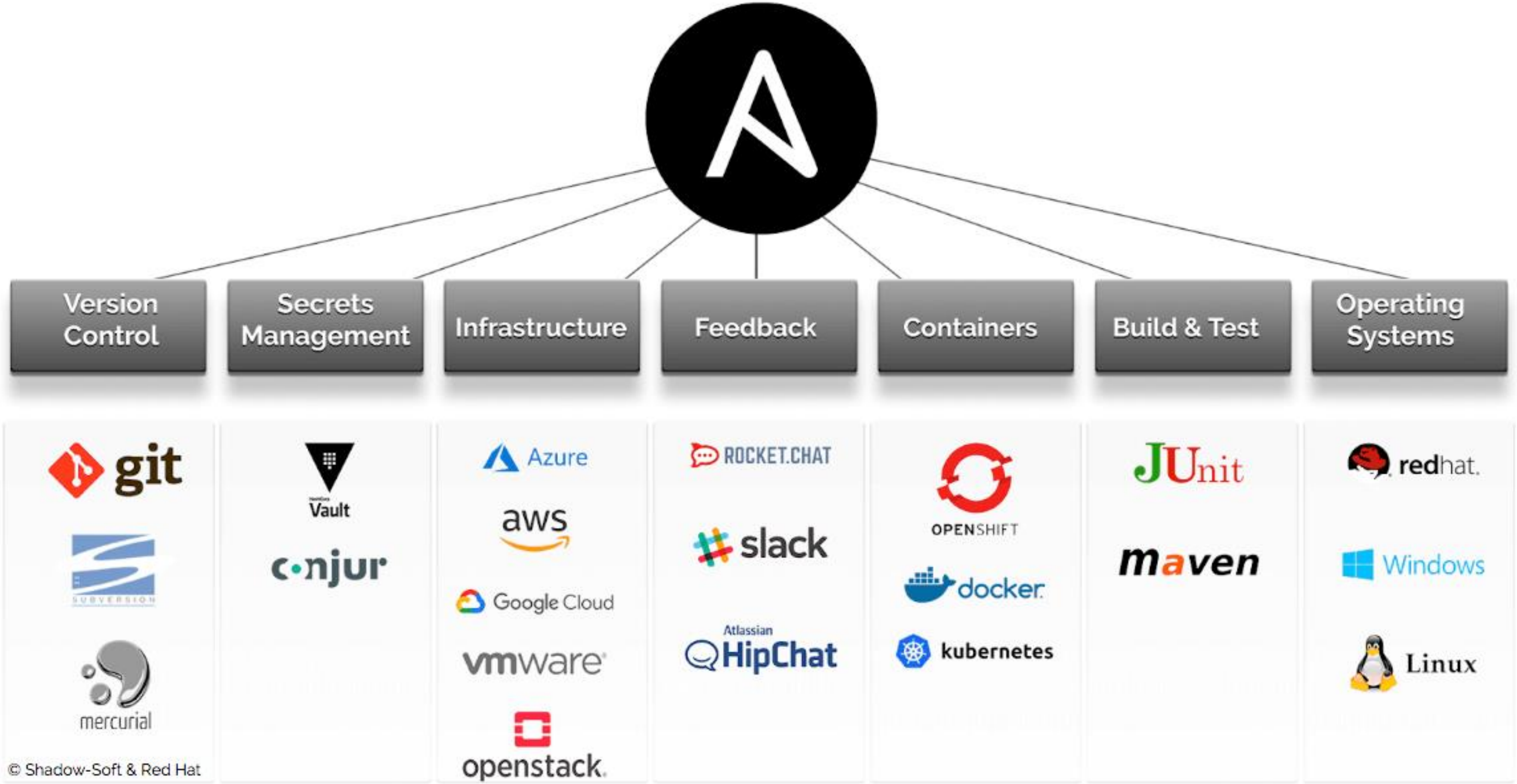
▪ Ansible

- *실습 환경의 구성*



▪ *Ansible*

- *지원 sw*



Version Control

Secrets Management

Infrastructure

Feedback

Containers

Build & Test

Operating Systems

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Ansible

- *할 수 있는 일*
  - *설치: apt-get, yum, homebrew …*
  - *환경 설정 파일 및 스크립트 배포: copy, template …*
  - *다운로드: get_url, git, subversion …*
  - *실행: shell, task …*
- *결과*
  - *ok*
  - *failed*
  - *changed*
  - *unreachable*

Ansible

실습 환경의 구성

- VMWare
- CentOS
  - Network: Bridge Network
  - IP, Hostname 변경

    ex) Ansible Server → 192.168.10.10, ansible-server

    ex) Ansible Node01 → 192.168.10.11, ansible-node01

    ex) Ansible Node02 → 192.168.10.12, ansible-node02

    ex) Ansible Node03 → 192.168.10.13, ansible-node03
- ping 테스트
  - $ ping 192.168.10.11

Ansible

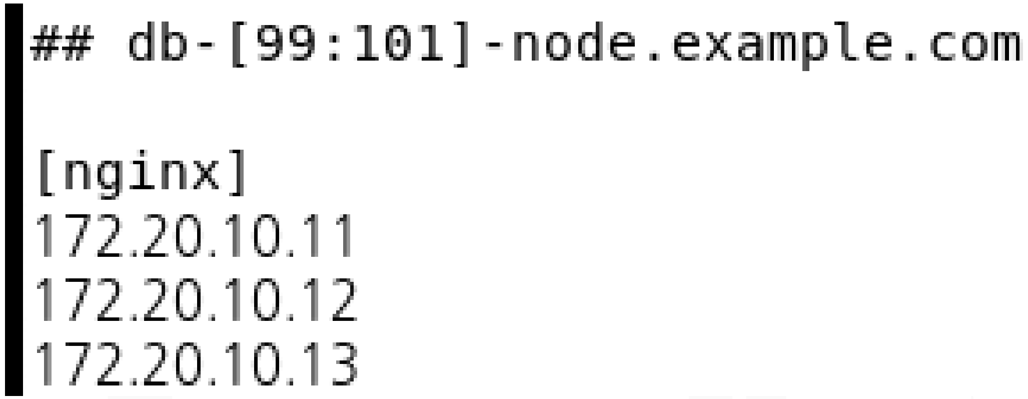
- ***Ansible Core 설치***
  - ***$ yum install ansible***
  - ***$ ansible --version***

- ***/etc/ansible/ansible.cfg***
  - ***환경 설정 파일***

- ***/etc/ansible/hosts***
  - ***Ansible 에서 접속하는 호스트 목록***

    practice)

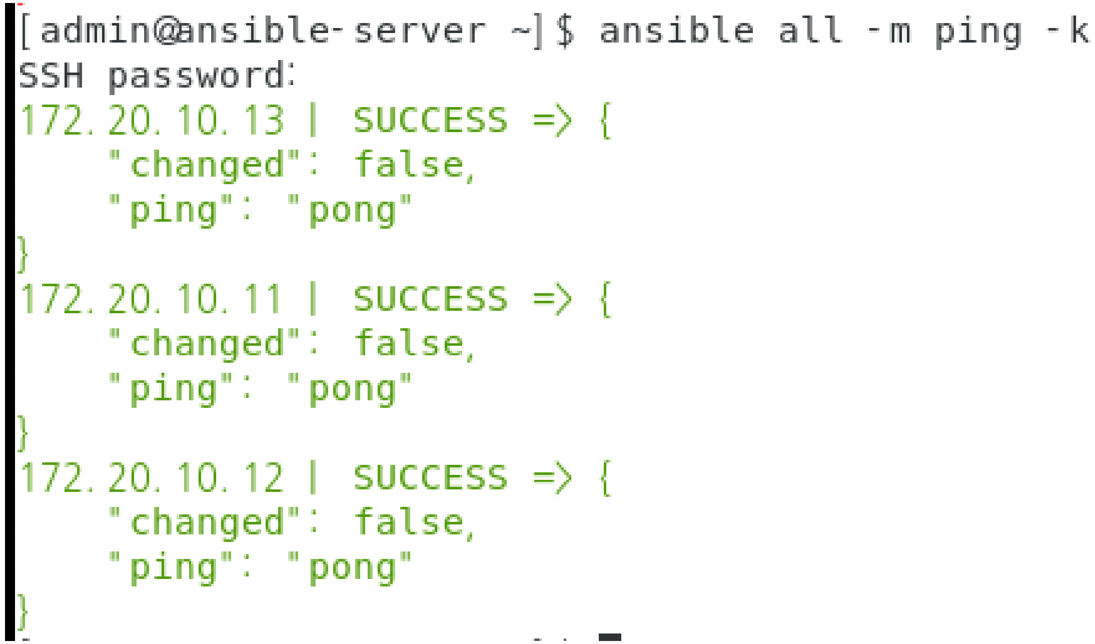
    [nginx] 추가



```
## db-[99:101]-node.example.com

[nginx]
172.20.10.11
172.20.10.12
172.20.10.13
```

Ansible

- *Ansible Core 설치*
  - *$ yum install ansible*
  - *$ ansible --version*
  - *테스트)*
    - *$ ansible all -m ping*
    - *$ ansible all -m ping -k*



```
[admin@ansible-server ~]$ ansible all -m ping -k
SSH password:
172.20.10.13 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
172.20.10.11 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
172.20.10.12 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
```

- *(Windows) Putty 설치*

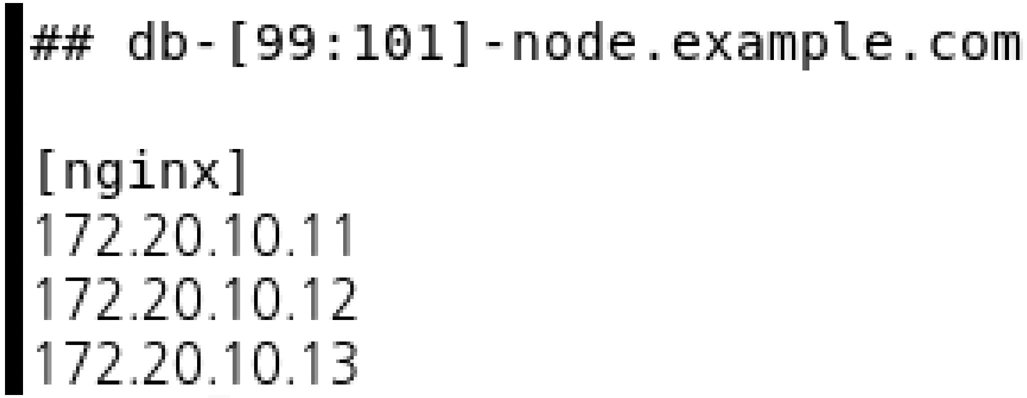
▪ *Ansible*

- ***/etc/ansible/ansible.cfg***
  - ***환경 설정 파일***

- ***/etc/ansible/hosts***
  - ***Ansible 에서 접속하는 호스트 목록***

    practice)

    [nginx] 추가



```
## db-[99:101]-node.example.com

[nginx]
172.20.10.11
172.20.10.12
172.20.10.13
```

Ansible

- ***실행 옵션***
  - ***-i (--inventory-file)***
    - ***적용 될 호스트들에 대한 파일 정보***
  - ***-m (--module-name)***
    - ***모듈 선택***
  - ***-k (--ask-pass)***
    - ***관리자 암호 요청***
  - ***-K (--ask-become-pass)***
    - ***관리자 권한 상승***
  - ***--list-hosts***
    - ***적용되는 호스트 목록***

Ansible

- **Practice**

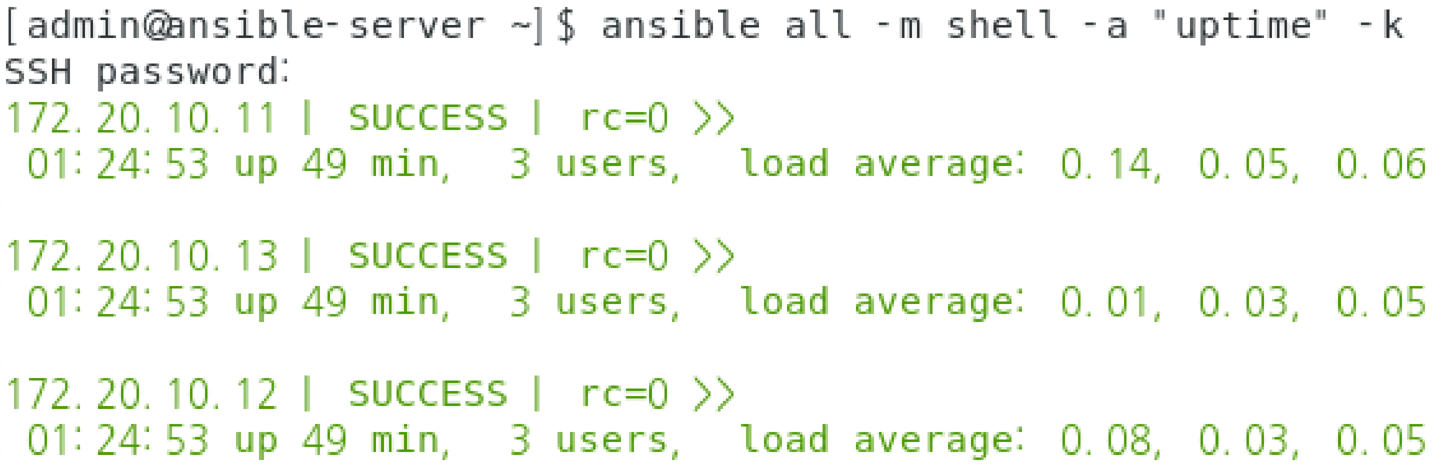
  1) uptime 확인
  2) 디스크 용량 확인
  3) 메모리 상태 확인
  4) 새로운 유저 생성
  5) 파일 전송
  6) 특정 서비스 설치

Ansible

- ***Practice***

  1) ***uptime 확인***
  2) *디스크 용량 확인*
  3) *메모리 상태 확인*
  4) *새로운 유저 생성*
  5) *파일 전송*
  6) *특정 서비스 설치*

```
$ ansible all -m shell -a “uptime” -k
```



```
[admin@ansible-server ~]$ ansible all -m shell -a "uptime" -k
SSH password:
172.20.10.11 | SUCCESS | rc=0 >>
 01:24:53 up 49 min,  3 users,  load average: 0.14, 0.05, 0.06

172.20.10.13 | SUCCESS | rc=0 >>
 01:24:53 up 49 min,  3 users,  load average: 0.01, 0.03, 0.05

172.20.10.12 | SUCCESS | rc=0 >>
 01:24:53 up 49 min,  3 users,  load average: 0.08, 0.03, 0.05
```

Ansible

- **Practice**

1) uptime 확인

2) **디스크 용량 확인**

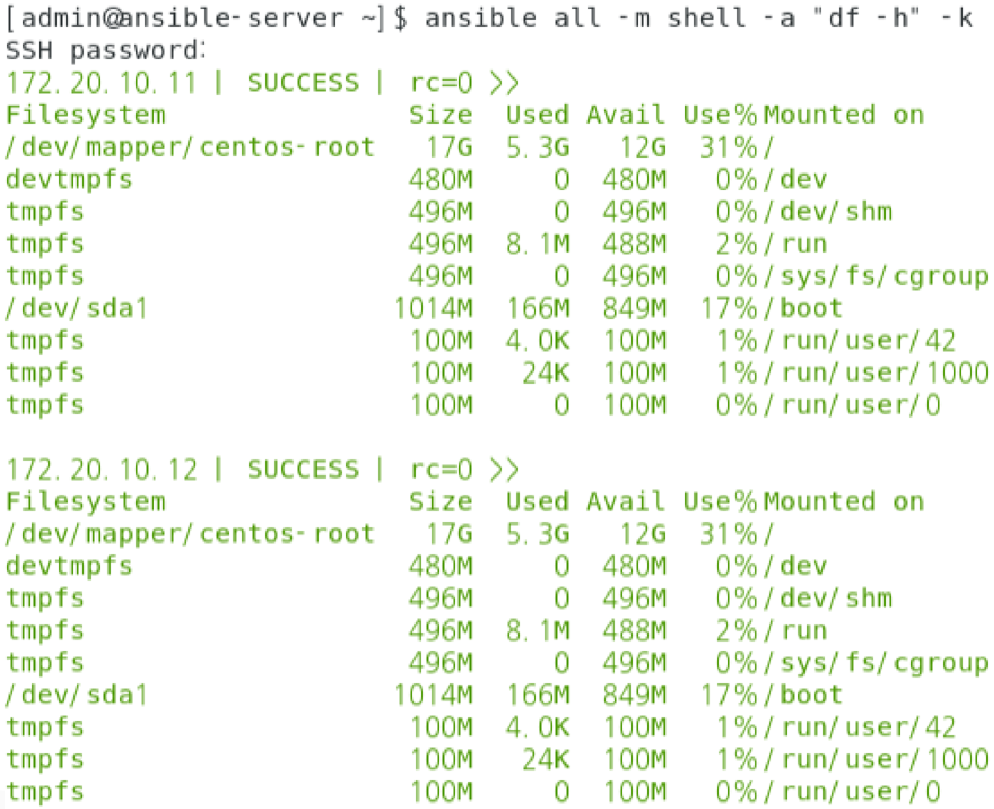
3) 메모리 상태 확인

4) 새로운 유저 생성

5) 파일 전송

6) 특정 서비스 설치

```
$ ansible all -m shell -a “df -h” -k
```



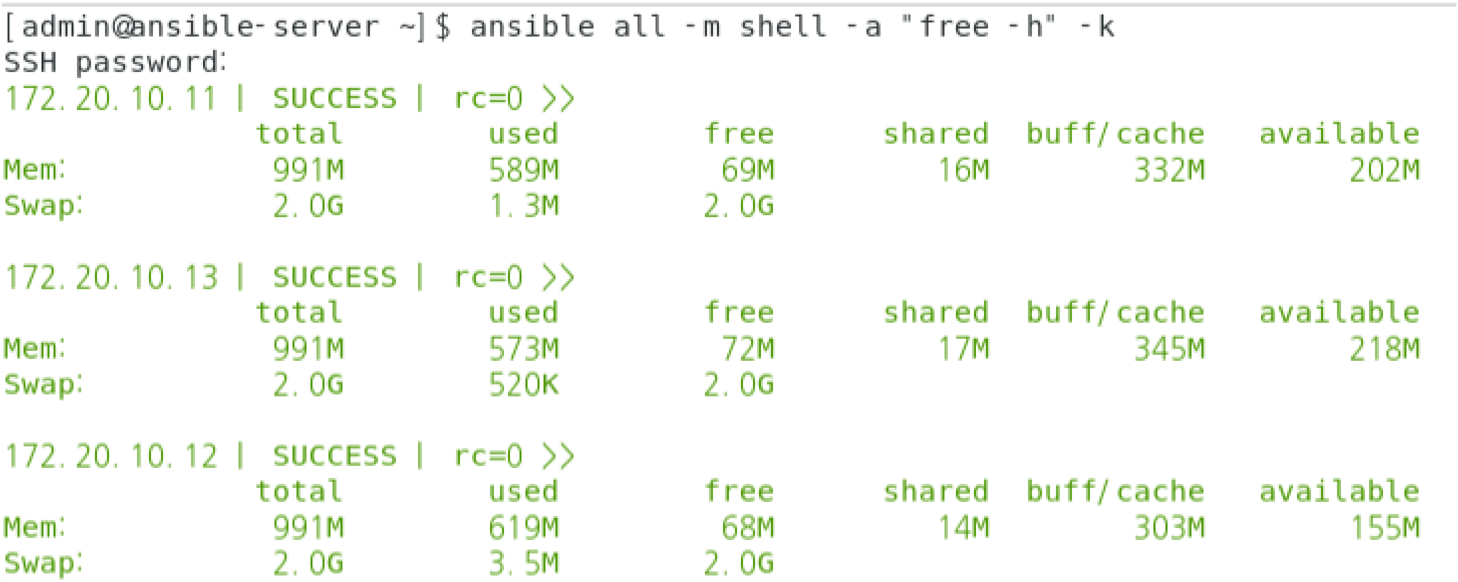
```
[admin@ansible-server ~]$ ansible all -m shell -a "df -h" -k
SSH password:
172.20.10.11 | SUCCESS | rc=0 >>
Filesystem               Size  Used Avail Use% Mounted on
/dev/mapper/centos-root   17G  5.3G   12G  31% /
devtmpfs                 480M     0  480M   0% /dev
tmpfs                    496M     0  496M   0% /dev/shm
tmpfs                    496M  8.1M  488M   2% /run
tmpfs                    496M     0  496M   0% /sys/fs/cgroup
/dev/sda1               1014M  166M  849M  17% /boot
tmpfs                    100M  4.0K  100M   1% /run/user/42
tmpfs                    100M   24K  100M   1% /run/user/1000
tmpfs                    100M     0  100M   0% /run/user/0

172.20.10.12 | SUCCESS | rc=0 >>
Filesystem               Size  Used Avail Use% Mounted on
/dev/mapper/centos-root   17G  5.3G   12G  31% /
devtmpfs                 480M     0  480M   0% /dev
tmpfs                    496M     0  496M   0% /dev/shm
tmpfs                    496M  8.1M  488M   2% /run
tmpfs                    496M     0  496M   0% /sys/fs/cgroup
/dev/sda1               1014M  166M  849M  17% /boot
tmpfs                    100M  4.0K  100M   1% /run/user/42
tmpfs                    100M   24K  100M   1% /run/user/1000
tmpfs                    100M     0  100M   0% /run/user/0
```

Ansible

Practice

1) uptime 확인
2) 디스크 용량 확인
3) **메모리 상태 확인**
4) 새로운 유저 생성
5) 파일 전송
6) 특정 서비스 설치

```
$ ansible all -m shell -a “free -h” -k
```



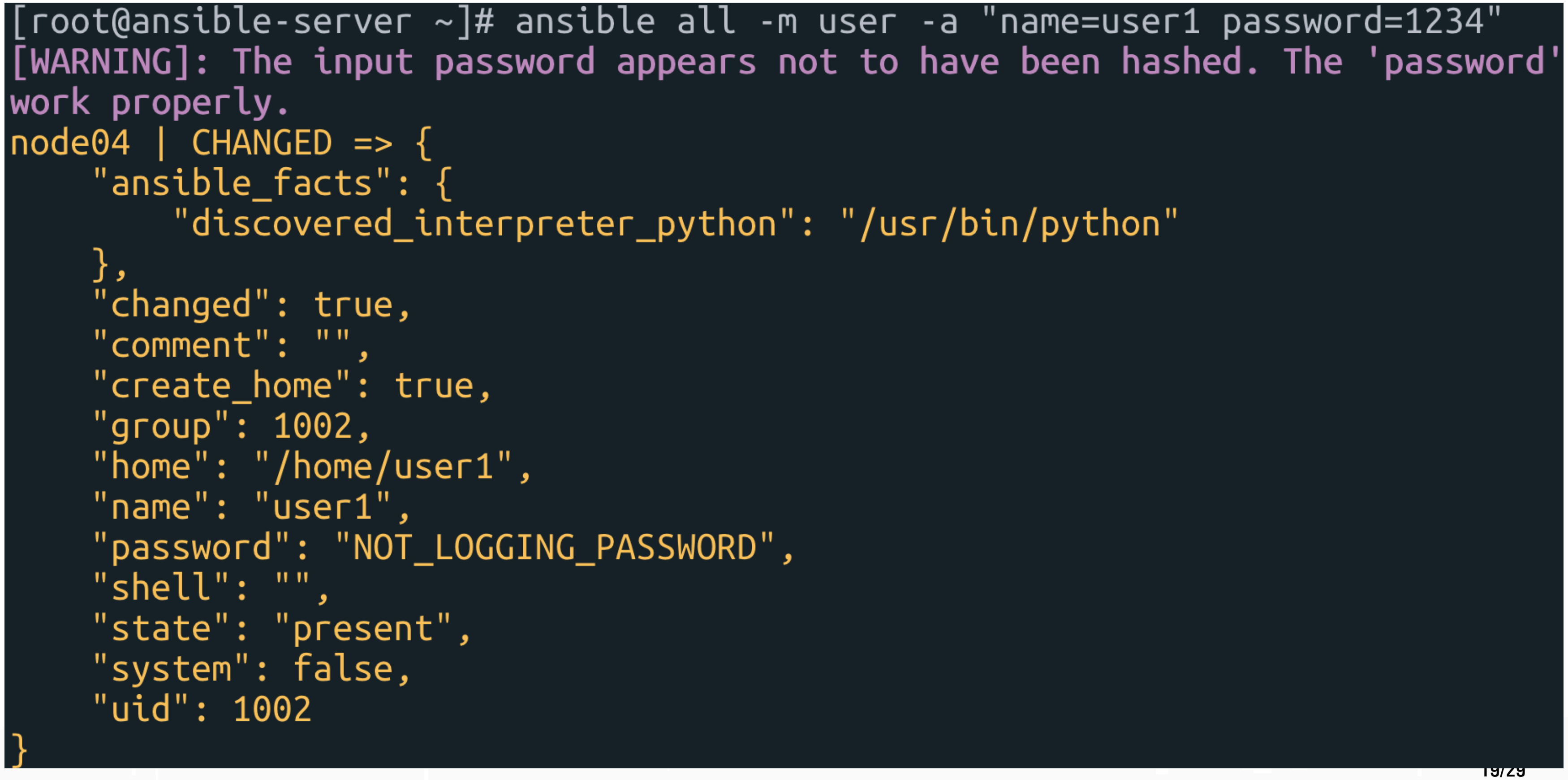
```
[admin@ansible-server ~]$ ansible all -m shell -a "free -h" -k
SSH password:
172.20.10.11 | SUCCESS | rc=0 >>
              total        used        free      shared  buff/cache   available
Mem:           991M        589M         69M         16M        332M        202M
Swap:          2.0G        1.3M        2.0G

172.20.10.13 | SUCCESS | rc=0 >>
              total        used        free      shared  buff/cache   available
Mem:           991M        573M         72M         17M        345M        218M
Swap:          2.0G        520K        2.0G

172.20.10.12 | SUCCESS | rc=0 >>
              total        used        free      shared  buff/cache   available
Mem:           991M        619M         68M         14M        303M        155M
Swap:          2.0G        3.5M        2.0G
```

Ansible

- ***Practice***

  1) *uptime 확인*
  2) *디스크 용량 확인*
  3) *메모리 상태 확인*
  4) ***새로운 유저 생성***
  5) *파일 전송*
  6) *특정 서비스 설치*

```
$ ansible all -m user -a “name=user1 password=1234” -k
```



```
[root@ansible-server ~]# ansible all -m user -a "name=user1 password=1234"
[WARNING]: The input password appears not to have been hashed. The 'password'
work properly.
node04 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": true,
    "comment": "",
    "create_home": true,
    "group": 1002,
    "home": "/home/user1",
    "name": "user1",
    "password": "NOT_LOGGING_PASSWORD",
    "shell": "",
    "state": "present",
    "system": false,
    "uid": 1002
}
```

Ansible

- **Practice**

1) uptime 확인

2) 디스크 용량 확인

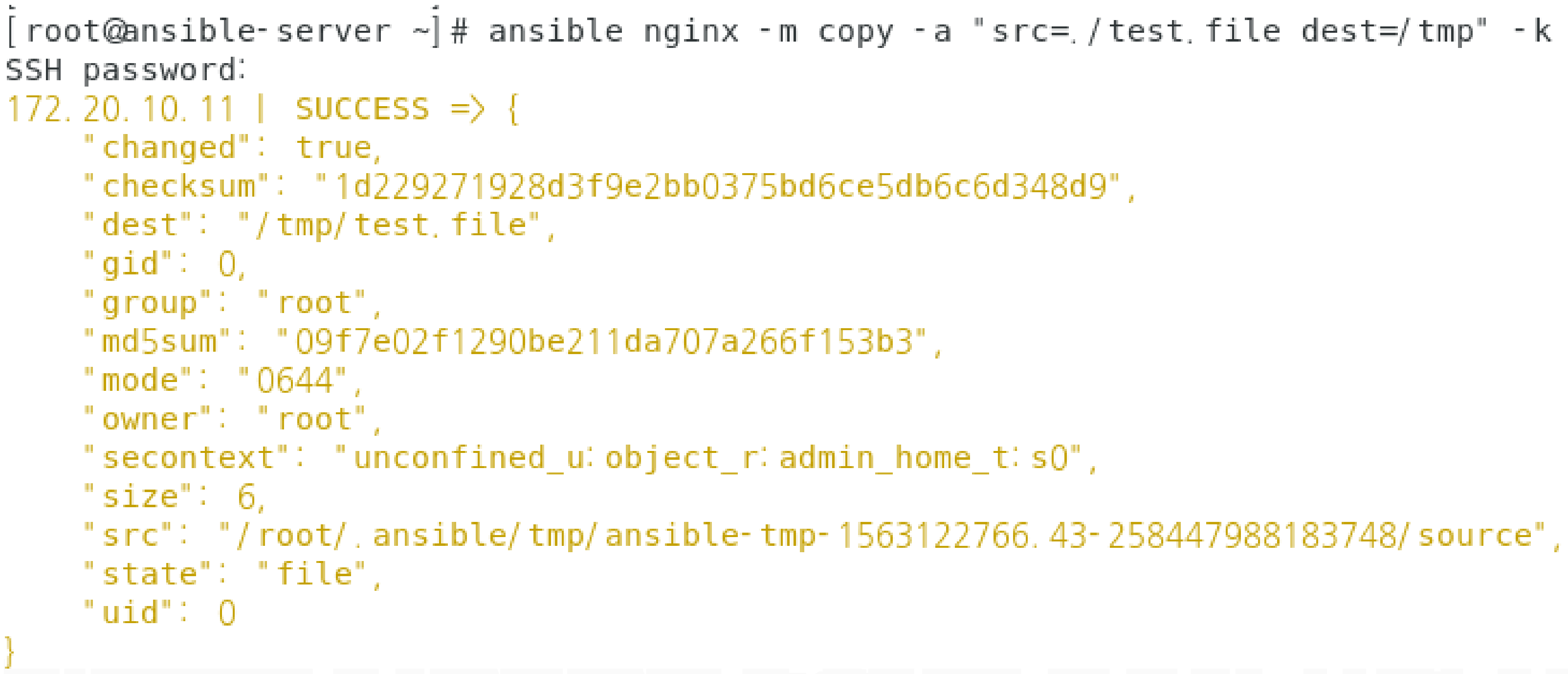
3) 메모리 상태 확인

4) 새로운 유저 생성

5) **파일 전송**

6) 특정 서비스 설치

```
$ ansible nginx -m copy -a “src=./test.file
                                dest=/tmp” -k
```



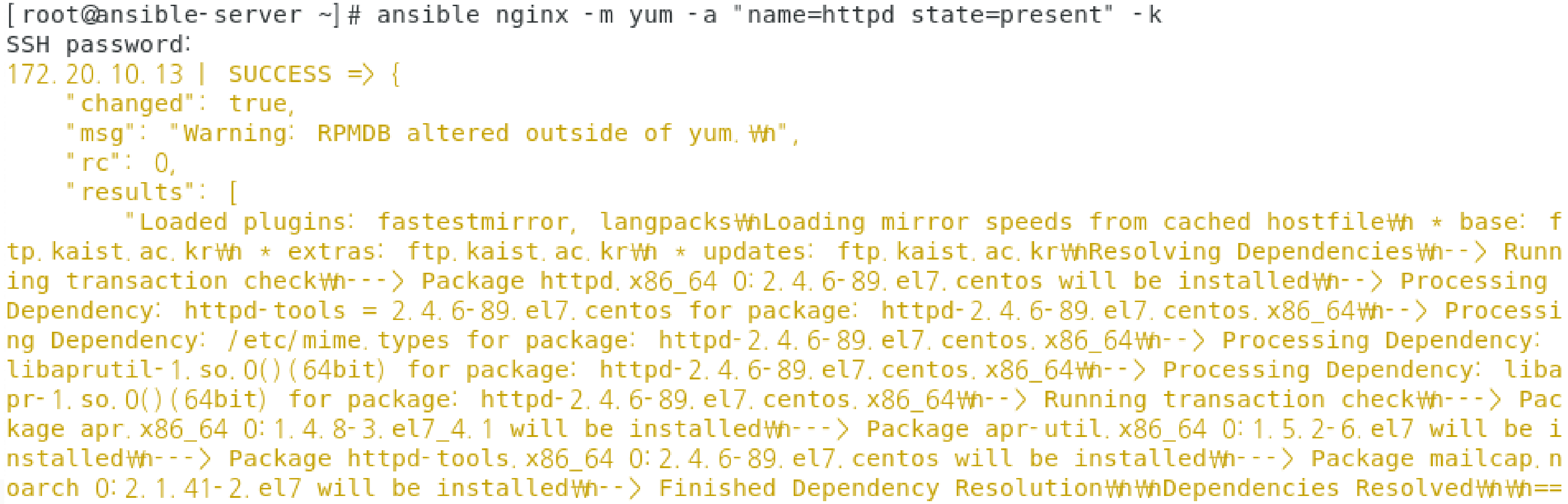
```
[root@ansible-server ~]# ansible nginx -m copy -a "src=./test.file dest=/tmp" -k
SSH password:
172.20.10.11 | SUCCESS => {
    "changed": true,
    "checksum": "1d229271928d3f9e2bb0375bd6ce5db6c6d348d9",
    "dest": "/tmp/test.file",
    "gid": 0,
    "group": "root",
    "md5sum": "09f7e02f1290be211da707a266f153b3",
    "mode": "0644",
    "owner": "root",
    "secontext": "unconfined_u:object_r:admin_home_t:s0",
    "size": 6,
    "src": "/root/.ansible/tmp/ansible-tmp-1563122766.43-258447988183748/source",
    "state": "file",
    "uid": 0
}
```

Ansible

Practice

1) uptime 확인
2) 디스크 용량 확인
3) 메모리 상태 확인
4) 새로운 유저 생성
5) 파일 전송
6) **특정 서비스 설치**

```
$ ansible nginx -m yum -a “name=httpd state=present”
-k
```



```
[root@ansible-server ~]# ansible nginx -m yum -a "name=httpd state=present" -k
SSH password:
172.20.10.13 | SUCCESS => {
    "changed": true,
    "msg": "Warning: RPMDB altered outside of yum.₩n",
    "rc": 0,
    "results": [
        "Loaded plugins: fastestmirror, langpacks₩nLoading mirror speeds from cached hostfile₩n * base: f
tp.kaist.ac.kr₩n * extras: ftp.kaist.ac.kr₩n * updates: ftp.kaist.ac.kr₩nResolving Dependencies₩n--> Runn
ing transaction check₩n---> Package httpd.x86_64 0:2.4.6-89.el7.centos will be installed₩n--> Processing
Dependency: httpd-tools = 2.4.6-89.el7.centos for package: httpd-2.4.6-89.el7.centos.x86_64₩n--> Processi
ng Dependency: /etc/mime.types for package: httpd-2.4.6-89.el7.centos.x86_64₩n--> Processing Dependency:
libaprutil-1.so.0()(64bit) for package: httpd-2.4.6-89.el7.centos.x86_64₩n--> Processing Dependency: liba
pr-1.so.0()(64bit) for package: httpd-2.4.6-89.el7.centos.x86_64₩n--> Running transaction check₩n---> Pac
kage apr.x86_64 0:1.4.8-3.el7_4.1 will be installed₩n---> Package apr-util.x86_64 0:1.5.2-6.el7 will be i
nstalled₩n---> Package httpd-tools.x86_64 0:2.4.6-89.el7.centos will be installed₩n---> Package mailcap.n
oarch 0:2.1.41-2.el7 will be installed₩n--> Finished Dependency Resolution₩n₩nDependencies Resolved₩n₩n==
```

Ansible

- ***Playbook***
  - *사용자가 원하는 내용을 미리 작성해 놓은 파일*
  - *ex) 다수의 서버에 반복 작업을 처리하는 경우*

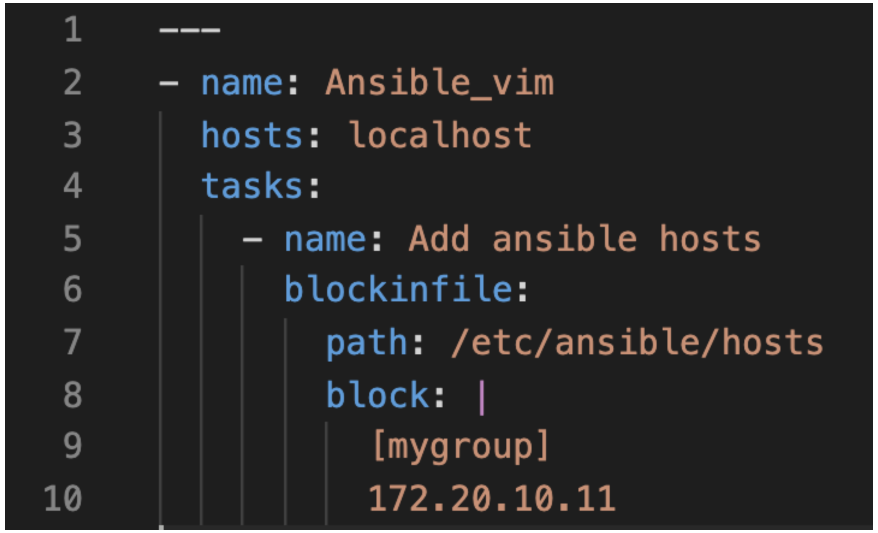
1) 설치
2) 파일 전송
3) 서비스 재시작

- ***멱등성***
  - *같은 설정을 여러번 적용하더라도 결과가 달라지지 않는 성질*

ex) echo -e “[mygroup]\n172.20.10.11” >> /etc/ansible/hosts

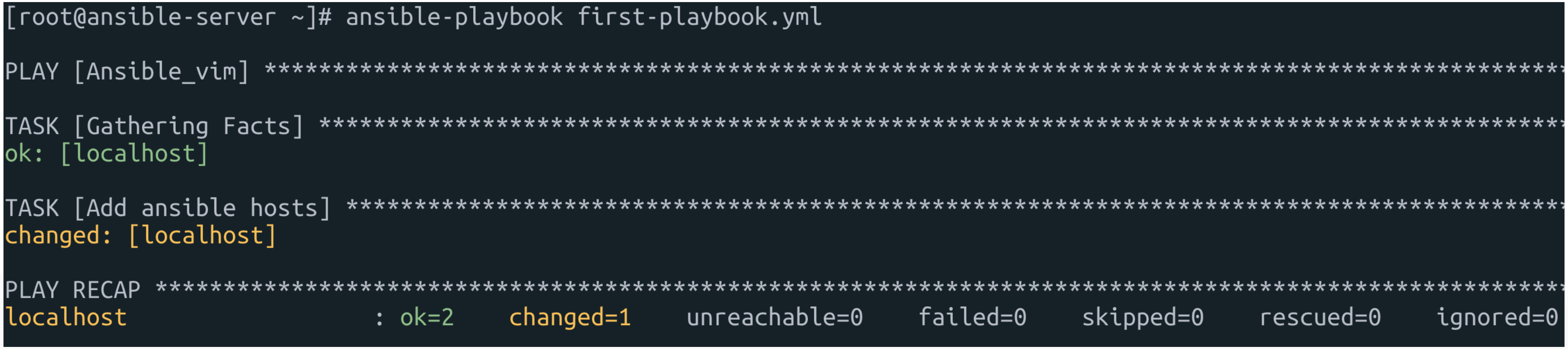
▪ Ansible

- **_Playbook_**
  - *first-playbook.yml 작성*



```yaml
---
- name: Ansible_vim
  hosts: localhost
  tasks:
    - name: Add ansible hosts
      blockinfile:
        path: /etc/ansible/hosts
        block: |
          [mygroup]
          172.20.10.11
```

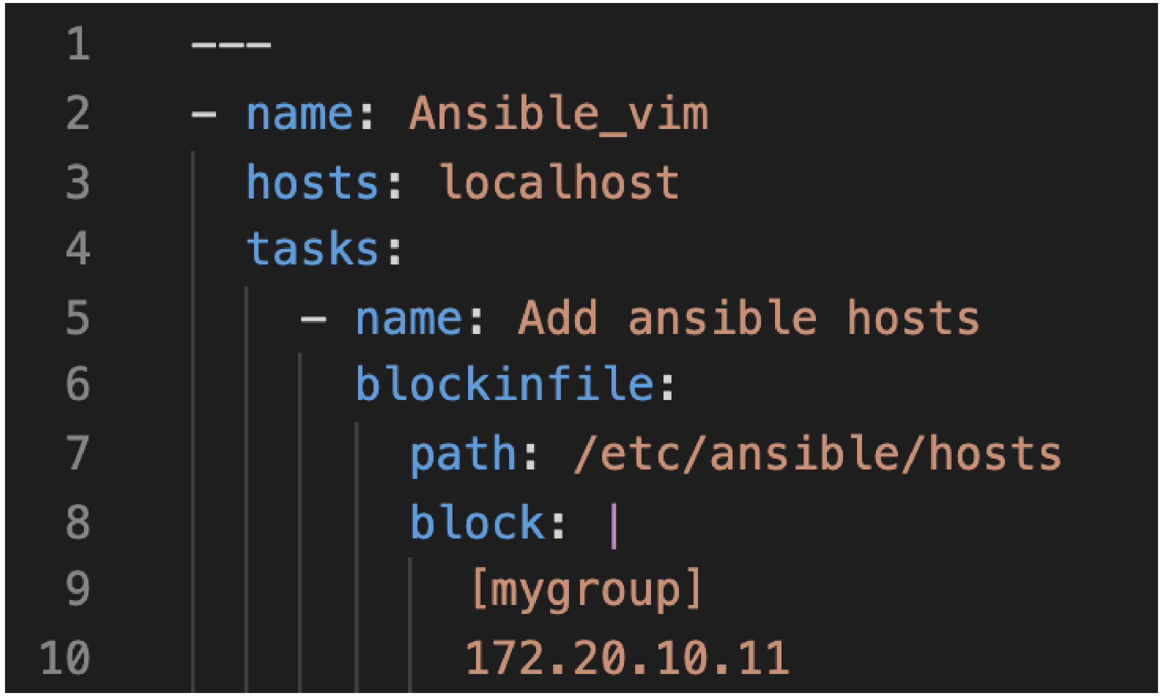
  - ***$ ansible-playbook first-playbook.yml***



```
[root@ansible-server ~]# ansible-playbook first-playbook.yml

PLAY [Ansible_vim] *************************************************************************************************

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

TASK [Add ansible hosts] *******************************************************************************************
changed: [localhost]

PLAY RECAP *********************************************************************************************************
localhost                  : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

Ansible

- ***YAML***
  - ***YAML Ain’t Markup Language***
  - ***JSON 유사하게 작성되는 데이터 파일***

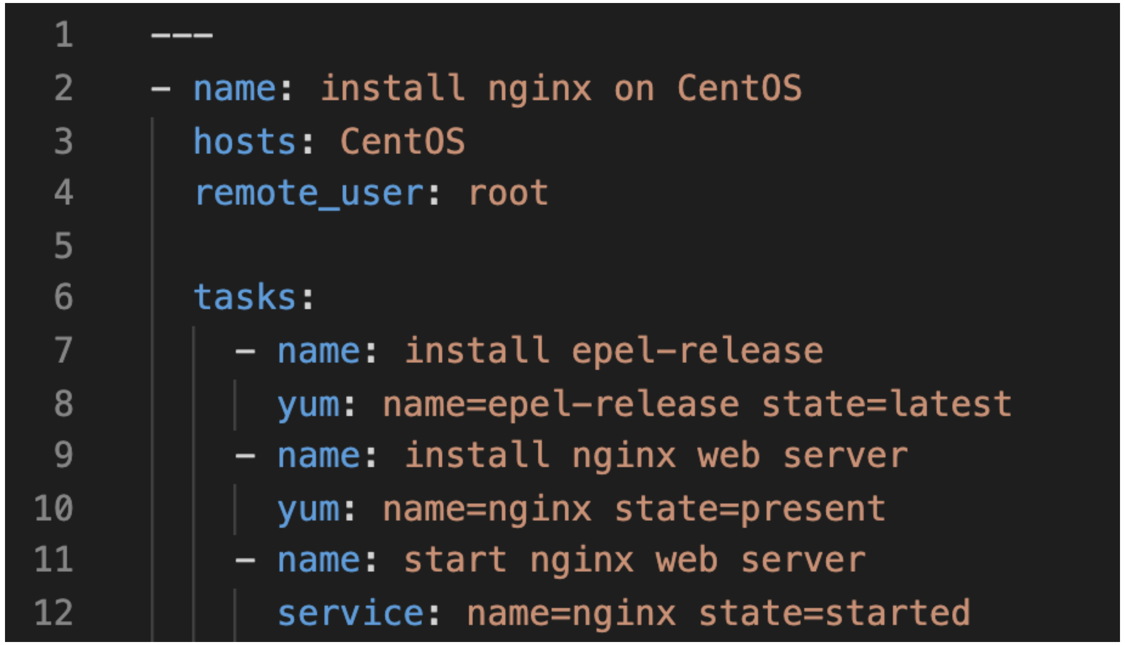


```yaml
---
- name: Ansible_vim
  hosts: localhost
  tasks:
    - name: Add ansible hosts
      blockinfile:
        path: /etc/ansible/hosts
        block: |
          [mygroup]
          172.20.10.11
```

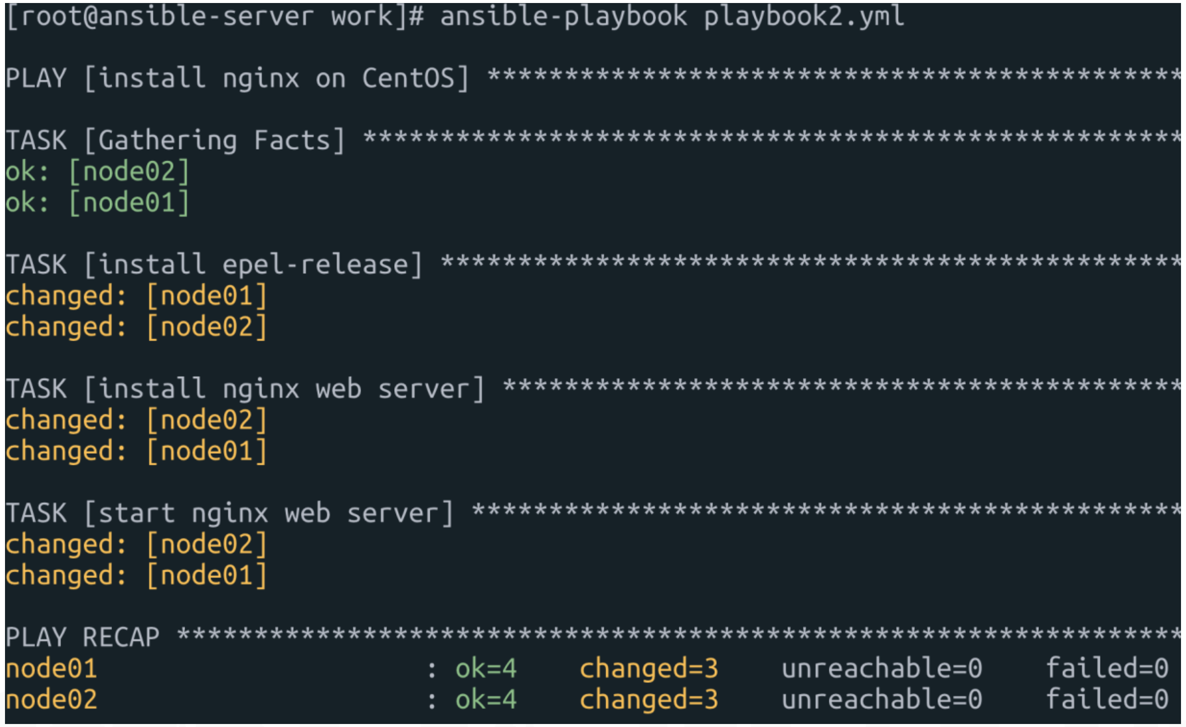
Ansible

- ***Practice***

  - *각 node에 nginx 서비스 설치 후 작동*



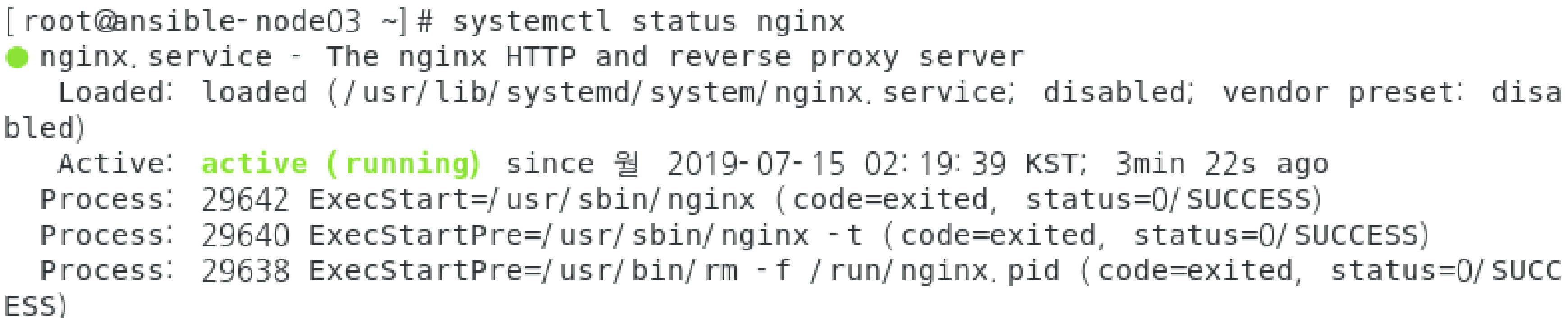
```yaml
---
- name: install nginx on CentOS
  hosts: CentOS
  remote_user: root

  tasks:
    - name: install epel-release
      yum: name=epel-release state=latest
    - name: install nginx web server
      yum: name=nginx state=present
    - name: start nginx web server
      service: name=nginx state=started
```



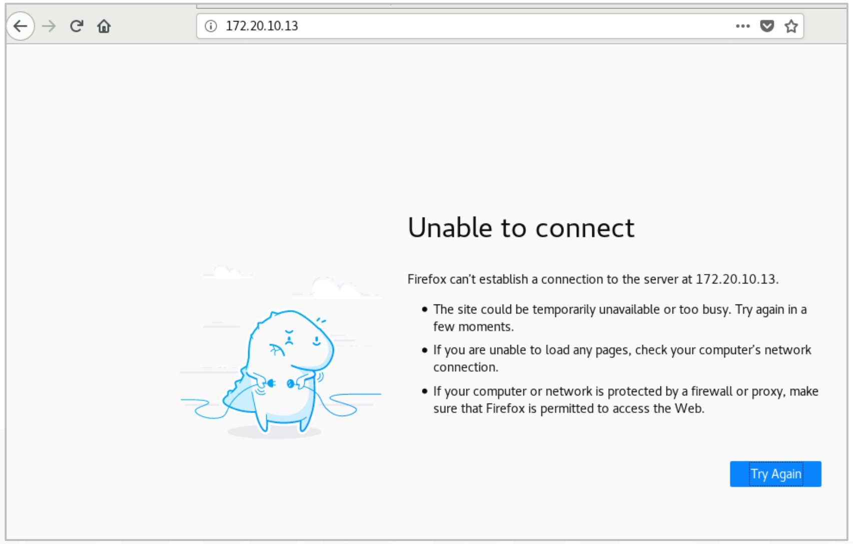
```
[root@ansible-server work]# ansible-playbook playbook2.yml

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

TASK [Gathering Facts] *****************************************************
ok: [node02]
ok: [node01]

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

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

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

PLAY RECAP *****************************************************************
node01                     : ok=4    changed=3    unreachable=0    failed=0
node02                     : ok=4    changed=3    unreachable=0    failed=0
```

▪ *Ansible*

- ***Practice***
  - ***nginx 동작 테스트***
    - ***$ systemctl status nginx***



```
[root@ansible-node03 ~]# systemctl status nginx
● nginx.service - The nginx HTTP and reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; disabled; vendor preset: disa
bled)
   Active: active (running) since 월 2019-07-15 02:19:39 KST; 3min 22s ago
  Process: 29642 ExecStart=/usr/sbin/nginx (code=exited, status=0/SUCCESS)
  Process: 29640 ExecStartPre=/usr/sbin/nginx -t (code=exited, status=0/SUCCESS)
  Process: 29638 ExecStartPre=/usr/bin/rm -f /run/nginx.pid (code=exited, status=0/SUCC
ESS)
 Main PID: 29644 (nginx)
```



Unable to connect

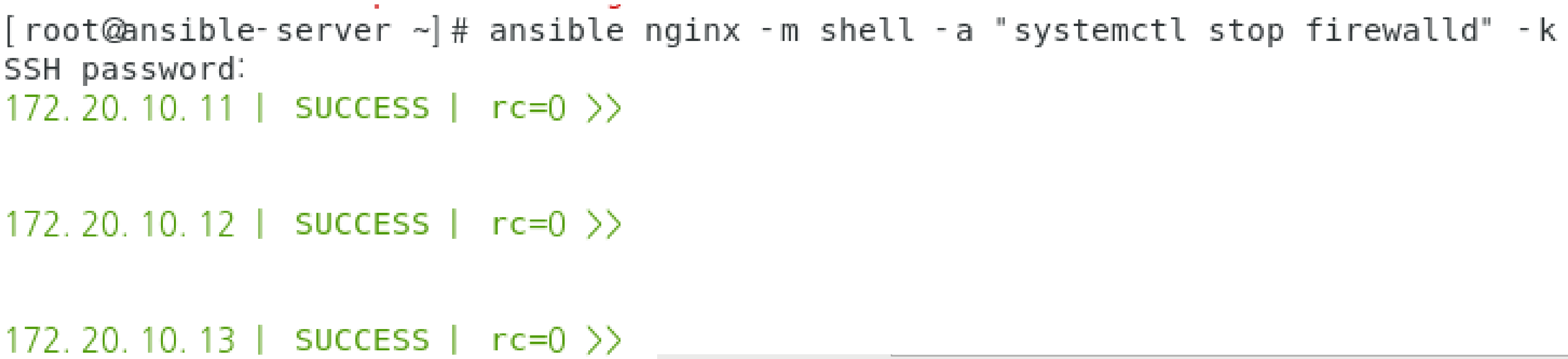
Firefox can't establish a connection to the server at 172.20.10.13.

- The site could be temporarily unavailable or too busy. Try again in a few moments.
- If you are unable to load any pages, check your computer's network connection.
- If your computer or network is protected by a firewall or proxy, make sure that Firefox is permitted to access the Web.

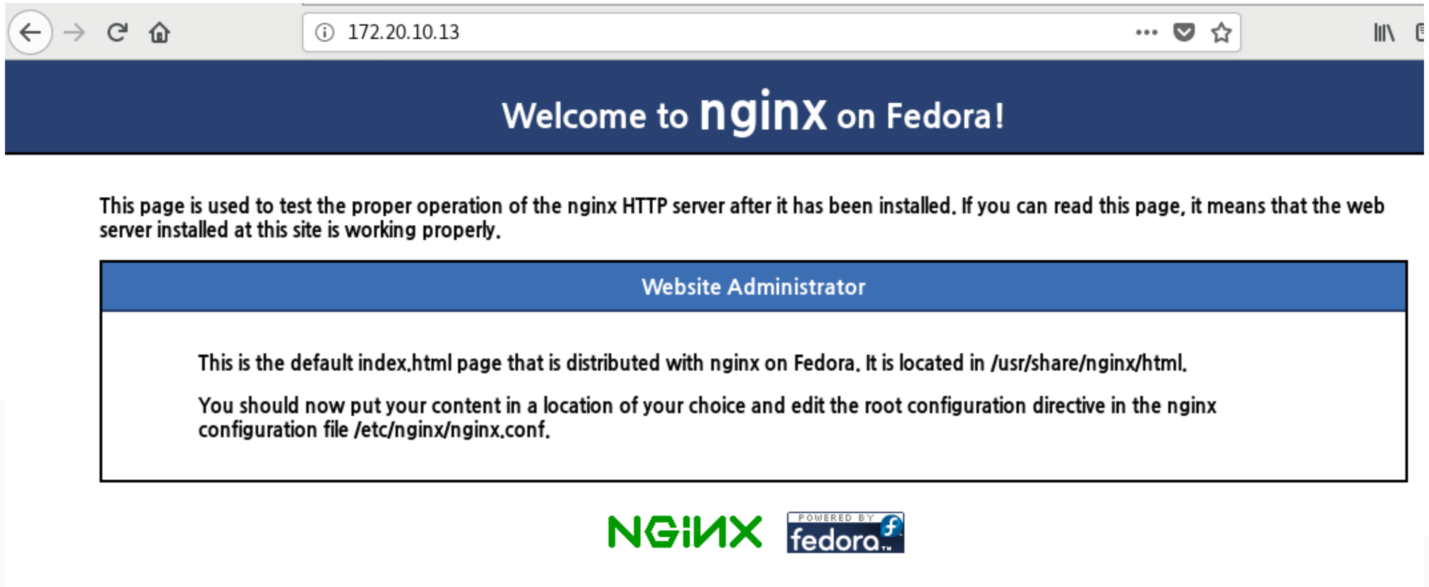
Ansible

- ***Practice***

  - ***Q) ansible 명령어를 이용하여 firewalld 작동 (or 중지)***



```
[root@ansible-server ~]# ansible nginx -m shell -a "systemctl stop firewalld" -k
SSH password:
172.20.10.11 | SUCCESS | rc=0 >>


172.20.10.12 | SUCCESS | rc=0 >>


172.20.10.13 | SUCCESS | rc=0 >>
```



Welcome to **nginx** on Fedora!

This page is used to test the proper operation of the nginx HTTP server after it has been installed. If you can read this page, it means that the web server installed at this site is working properly.

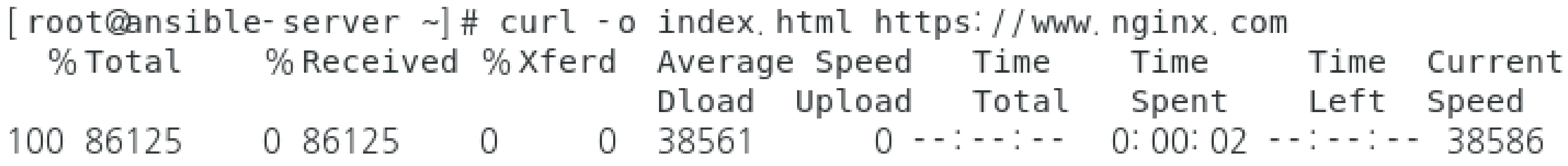
Website Administrator

This is the default index.html page that is distributed with nginx on Fedora. It is located in /usr/share/nginx/html.

You should now put your content in a location of your choice and edit the root configuration directive in the nginx configuration file /etc/nginx/nginx.conf.

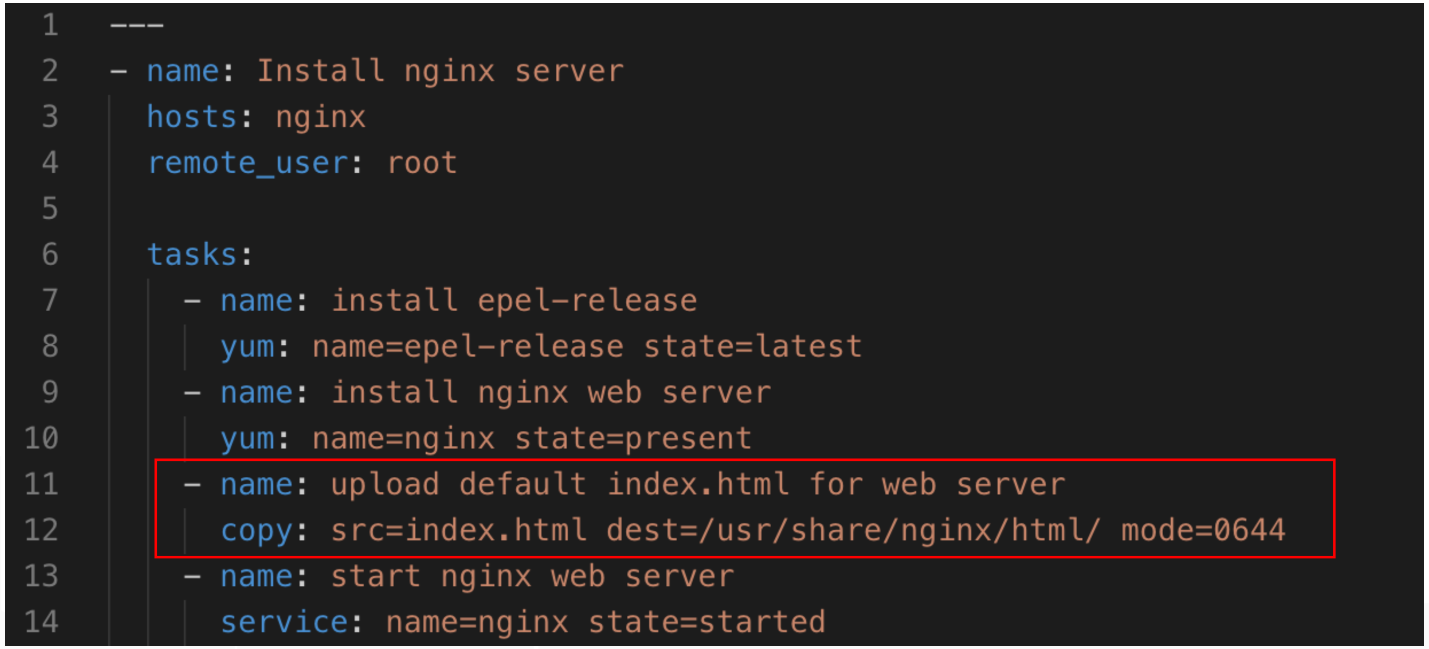
Ansible

- ***Practice***
  - ***메인 페이지 변경***
    - ***$ curl -o index.html https://www.nginx.com***



```
[root@ansible-server ~]# curl -o index.html https://www.nginx.com
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 86125    0 86125    0     0  38561      0 --:--:--  0:00:02 --:--:-- 38586
```

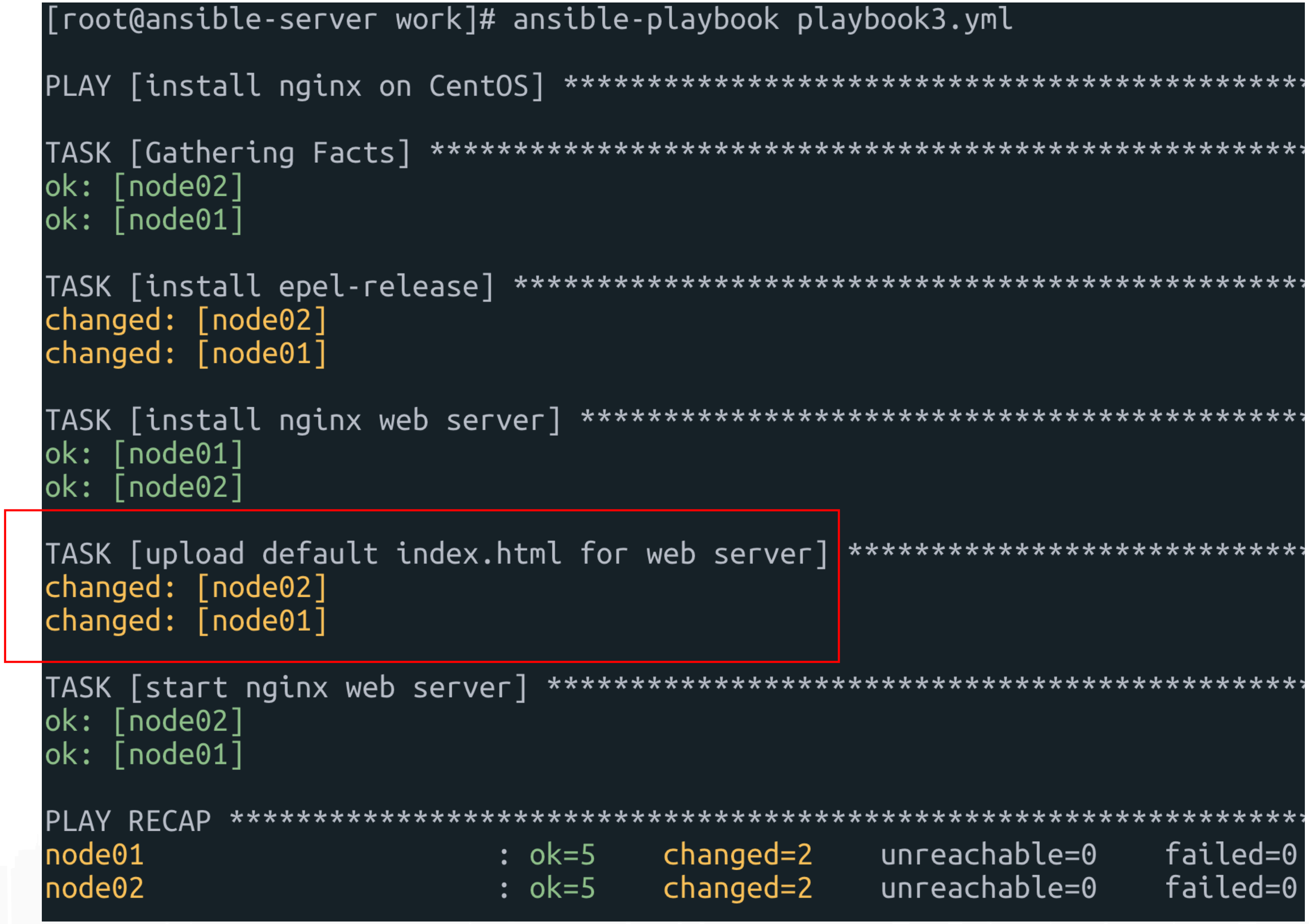
  - ***yaml 파일 수정***



```yaml
---
- name: Install nginx server
  hosts: nginx
  remote_user: root

  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
      copy: src=index.html dest=/usr/share/nginx/html/ mode=0644
    - name: start nginx web server
      service: name=nginx state=started
```

Ansible

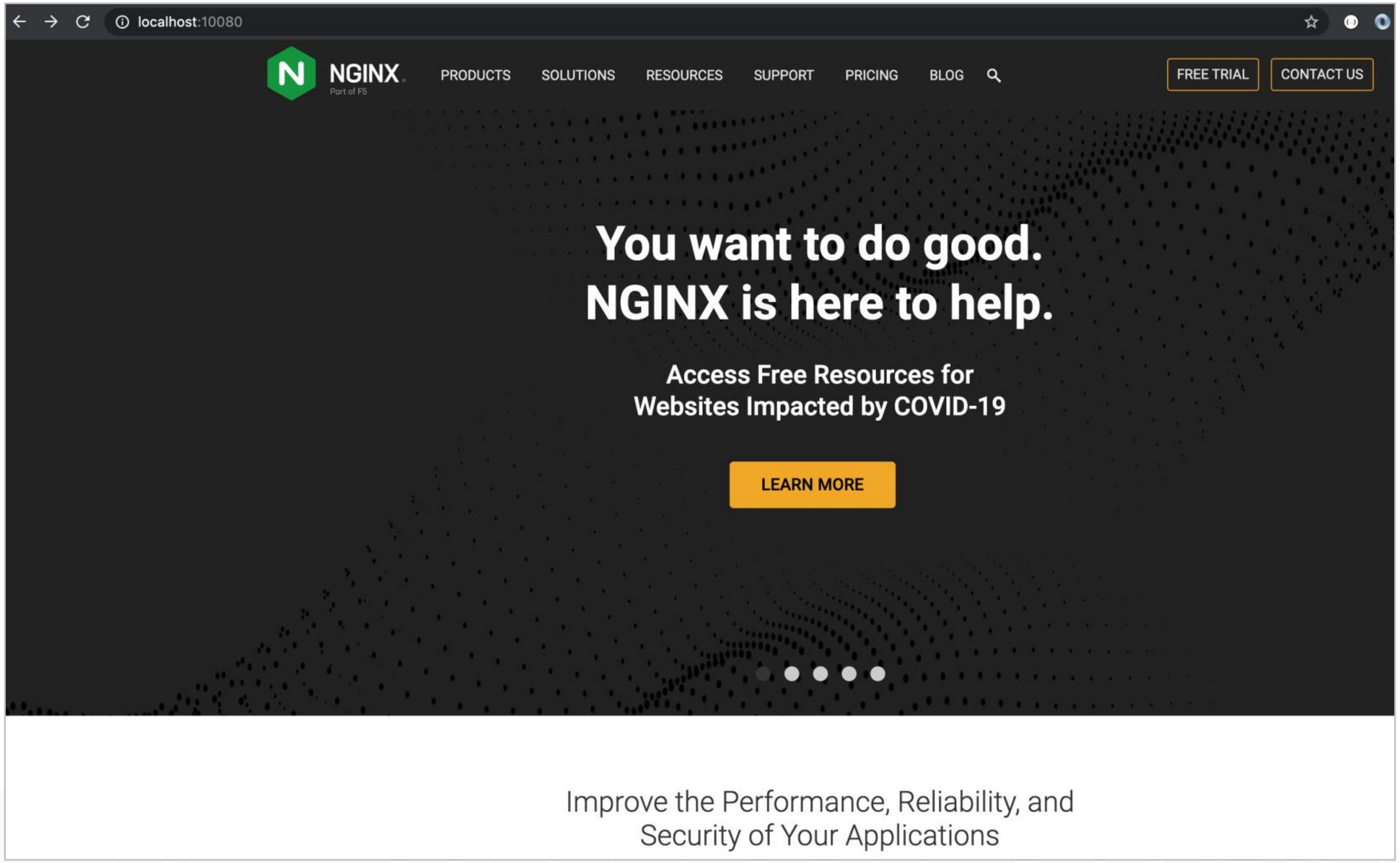
- ***Practice***



```
[root@ansible-server work]# ansible-playbook playbook3.yml

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

TASK [Gathering Facts] ****************************************************
ok: [node02]
ok: [node01]

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

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

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

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

PLAY RECAP ****************************************************************
node01                     : ok=5    changed=2    unreachable=0    failed=0
node02                     : ok=5    changed=2    unreachable=0    failed=0
```

Ansible

- ***Practice***
  - ***http://172.20.10.11 or http://localhost:10080***


localhost:10080
NGINX
Part of F5
PRODUCTS
SOLUTIONS
RESOURCES
SUPPORT
PRICING
BLOG
FREE TRIAL
CONTACT US
You want to do good.
NGINX is here to help.
Access Free Resources for
Websites Impacted by COVID-19
LEARN MORE
Improve the Performance, Reliability, and
Security of Your Applications