

# TTS 10.0 COOKBOOK

( NSD ARCHITECTURE DAY01 )

版本编号 10.0

2018-08 达内 IT 培训集团



# 1. 案例 1: 环境准备

#### 问题

本案例要求准备 ansible 的基础环境:

- 启动6台虚拟机
- 禁用 selinux 和 firewalld
- 编辑/etc/hosts
- 配置 yum 扩展源并在管理节点安装 ansible

#### 方案

此方案需要准备六台主机,1台管理主机,5台托管主机,以实现批量程序部署,批量运行命令等功能,具体要求如表-1所示:

	1×-1	
主机名	Ip 地址	角色
ansible	192.168.1.51	管理主机
web1	192.168.1.52	托管主机
web2	192.168.1.53	托管主机
db1	192.168.1.54	托管主机
db2	192.168.1.55	托管主机
cache	192.168.1.56	托管主机

表-1

#### 步骤

实现此案例需要按照如下步骤进行。

# 步骤一:基础环境准备

- 1) 启动 6 台虚拟机,由于已经讲过怎么创建,这里不再在案例里体现
- 2) 真机配置 yum 仓库

```
[root@room9pc01 ~]# tar -xf ansible_soft.tar.xz
[root@room9pc01 ~]# cd ansible_soft/
[root@room9pc01 ansible_soft]# mkdir /var/ftp/ansible
[root@room9pc01 ansible_soft]# cp * /var/ftp/ansible
[root@room9pc01 ansible_soft]# createrepo /var/ftp/ansible
Spawning worker 0 with 1 pkgs
Spawning worker 1 with 1 pkgs
Spawning worker 2 with 1 pkgs
Spawning worker 3 with 1 pkgs
Spawning worker 4 with 1 pkgs
Spawning worker 5 with 1 pkgs
Workers Finished
```



```
Saving Primary metadata
Saving file lists metadata
Saving other metadata
Generating sqlite DBs
Sqlite DBs complete
```

3)修改主机名(容易区分,6台机器都需要修改)这里以 ansible 主机为例子

```
[root@localhost ~]# echo ansible > /etc/hostname
[root@localhost ~]# hostname ansible
```

4)配置 ip (6台机器都需要配置),这里以 ansible 主机为例子

```
[root@localhost ~]# vim /etc/sysconfig/network-scripts/ifcfg-eth0
# Generated by dracut initrd
DEVICE="eth0"
ONBOOT="yes"
IPV6INIT="no"
IPV4_FAILURE_FATAL="no"
NM CONTROLLED="no"
TYPE="Ethernet"
BOOTPROTO="static"
IPADDR=192.168.1.51
PREFIX=24
GATEWAY=192.168.1.254
[root@localhost ~]# systemctl restart network
[root@localhost ~]# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
       inet 192.168.1.51 netmask 255.255.255.0 broadcast 192.168.1.255
       ether 52:54:00:b2:69:9e txqueuelen 1000 (Ethernet)
       RX packets 234 bytes 16379 (15.9 KiB)
       RX errors 0 dropped 36 overruns 0 frame 0
       TX packets 31 bytes 2618 (2.5 KiB)
       TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

5)配置 yum 客户端,在管理节点 ansible 上面配置

```
[root@ansible ~]# vim /etc/yum.repos.d/local.repo
   [local_repo]
   name=CentOS-$releasever - Base
   baseurl="ftp://192.168.1.254/system"
   enabled=1
   gpgcheck=1
   [local]
   name=local
   baseurl="ftp://192.168.1.254/ansible"
   enabled=1
   gpgcheck=0
   [root@ansible ~]# yum clean all
   [root@ansible ~]# yum repolist
   [root@ansible ~]# yum -y install ansible
   [root@ansible ~]# ansible --version
   ansible 2.4.2.0
     config file = /etc/ansible/ansible.cfg
     configured module search
                                     path
                                                 [u'/root/.ansible/plugins/modules',
u'/usr/share/ansible/plugins/modules']
     ansible python module location = /usr/lib/python2.7/site-packages/ansible
     executable location = /usr/bin/ansible
     python version = 2.7.5 (default, Aug 4 2017, 00:39:18) [GCC 4.8.5 20150623 (Red
Hat 4.8.5-16)]
```

6)请在6台主机上面配置/etc/hosts,这里以ansible主机为例子



```
[root@ansible ansible]# cat /etc/hosts
192.168.1.51 ansible
192.168.1.52 web1
192.168.1.53 web2
192.168.1.54 db1
192.168.1.55 db2
192.168.1.56 cache
```

# 2. 案例 2: 主机定义与分组:

问题

#### 本案例要求:

- 熟悉 ansible 配置文件
- 定义主机,分组和子组练习
- 自定义文件,多配置路径练习
- 步骤

实现此案例需要按照如下步骤进行。

# 步骤一:ansible.cfg 配置文件

```
[root@ansible ~]# cd /etc/ansible/
[root@ansible ansible]# ls
ansible.cfg hosts roles
[root@ansible ansible]# vim ansible.cfg
#inventory = /etc/ansible/hosts //指定分组文件路径, 主机的分组文件 hosts
[selinux] //组名称, selinux 的相关选项在这个下面配置
...
[colors] //组名称, colors 的相关选项在这个下面配置
...
```

# 步骤二:定义主机,分组和子组练习

#### 1)静态主机的定义

```
[root@ansible ansible]# vim hosts

[web]

web1

web2

[db]

db[1:2]
//1:2 为 db1 到 db2 两台主机 , 1:20 为 db1 到 db20 多台主机

[other]

cache

[root@ansible ansible]# ansible web --list-host //显示 web 组的主机

hosts (2):
```



```
web1
web2
[root@ansible ansible]# ansible db --list-host
hosts (2):
db1
db2
[root@ansible ansible]# ansible other --list-host
hosts (1):
cache
[root@ansible ansible]# ansible all --list-host //显示所有组的主机
hosts (5):
web1
web2
cache
db1
db2
```

#### 2)直接测试

```
[root@ansible ansible]# ansible cache -m ping
//测试是否可以连接,若失败颜色为红色
cache | UNREACHABLE! => {
    "changed": false,
    "msg": "Failed to connect to the host via ssh: ssh: Could not resolve hostname
cache: Name or service not known\r\n",
    "unreachable": true
}
```

# 3)修改后测试

```
[root@ansible ansible]# vi hosts
[other]
cache ansible_ssh_user="root" ansible_ssh_pass="a"

[root@ansible ansible]# ansible other -m ping //测试成功,颜色为绿色
cache | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
```

#### 4)不检测主机的 sshkey, 在第一次连接的时候不用输入 yes

```
[root@ansible ansible]# vim ansible.cfg
61 host_key_checking = False
[root@ansible ansible]# vim hosts
[web]
web1
web2
[web:vars]
ansible_ssh_user="root"
ansible ssh pass="a"
[root@ansible ansible]# ansible web -m ping
web2 | SUCCESS => {
   "changed": false,
    "ping": "pong"
web1 | SUCCESS => {
    "changed": false,
   "ping": "pong"
```



# 步骤三: 定义子组

```
[root@ansible ansible]# vi hosts
                 //指定子分组(app 可改:children 不改), web, db 是提前分好的组
web
db
[app:vars]
ansible_ssh_user="root"
ansible_ssh_pass="a"
[root@ansible ansible]# ansible app --list-host
 hosts (4):
   web1
   web2
   db1
   db2
[root@ansible ansible]# ansible app -m ping
web1 | SUCCESS => {
   "changed": false,
   "ping": "pong"
web2 | SUCCESS => {
   "changed": false,
   "ping": "pong"
db1 | SUCCESS => {
   "changed": false,
   "ping": "pong"
db2 | SUCCESS => {
   "changed": false,
   "ping": "pong"
```

#### 步骤四:多路径练习

#### 自定义的 ansible 文件只在当前路径生效

#### 1) 多路径

```
[root@ansible ~]# mkdir aaa
[root@ansible ~]# cd aaa/
[root@ansible aaa]# vim myhost
[app1]
web1
db1
[app2]
web2
db2
[app:children]
app1
app2
[other]
cache
[app:vars]
ansible_ssh_user="root"
ansible_ssh_pass="a"
[root@ansible aaa]# touch ansible.cfg
[root@ansible aaa]# grep -Ev "^#|^$" /etc/ansible/ansible.cfg
```



```
[defaults]
             = /etc/ansible/roles:/usr/share/ansible/roles
roles_path
host_key_checking = False
[inventory]
[privilege escalation]
[paramiko_connection]
[ssh_connection]
[persistent_connection]
[accelerate]
[selinux]
[colors]
[diff]
[root@ansible aaa]# vim ansible.cfg
[defaults]
inventory = myhost
host_key_checking = False
```

#### 2)测试结果

```
[root@ansible aaa]# ansible app1 -m ping
web1 | SUCCESS => {
   "changed": false,
   "ping": "pong"
db1 | SUCCESS => {
   "changed": false,
   "ping": "pong"
[root@ansible aaa]# ansible app -m ping
web1 | SUCCESS => {
   "changed": false,
   "ping": "pong"
db1 | SUCCESS => {
   "changed": false,
   "ping": "pong"
db2 | SUCCESS => {
   "changed": false,
   "ping": "pong"
web2 | SUCCESS => {
   "changed": false,
   "ping": "pong"
[root@ansible aaa]# ansible app --list-host
 hosts (4):
   web1
   db1
   web2
   db2
[root@ansible aaa]# cd
[root@ansible ~]# ansible app1 --list-host //切换到别的目录,测试失败
[WARNING]: Could not match supplied host pattern, ignoring: app1
 [WARNING]: No hosts matched, nothing to do
 hosts (0):
```



# 3. 案例 3: 动态主机

问题

#### 本案例要求:

- 脚本输出主机列表
- 步骤

实现此案例需要按照如下步骤进行。

#### 步骤一: 脚本输出主机列表

## 步骤二:脚本输出样例(这样写输出的结果有些乱)

```
[root@ansible aaa]# ./host.py
    {"aa": {"hosts": ["192.168.1.55", "192.168.1.56"], "vars": {"ansible_ssh_user":
"root", "ansible_ssh_pass": "a"}}, "192.168.1.54": {"ansible_ssh_user": "root",
"ansible_ssh_pass": "a"}, "bb": ["192.168.1.52", "192.168.1.53"]}
```

#### 步骤三:可以用 shell 脚本输出



```
"ansible_ssh_pass": "a"}
},
}
[root@ansible aaa]# vim ansible.cfg
[defaults]
inventory = my.sh
host_key_checking = False
[root@ansible aaa]# ansible aa -m ping
192.168.1.55 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
192.168.1.56 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
```

#### 步骤二:批量执行

#### 1) 查看负载

```
[root@ansible aaa]# ansible app -m command -a 'uptime'
db1 | SUCCESS | rc=0 >>
    11:35:52 up 1:59, 2 users, load average: 0.00, 0.01, 0.01

web1 | SUCCESS | rc=0 >>
    11:35:52 up 2:00, 2 users, load average: 0.00, 0.01, 0.02

db2 | SUCCESS | rc=0 >>
    11:35:53 up 1:59, 2 users, load average: 0.00, 0.01, 0.03

web2 | SUCCESS | rc=0 >>
    11:35:52 up 1:59, 2 users, load average: 0.00, 0.01, 0.02
```

#### 2) 查看时间

```
[root@ansible aaa]# ansible app -m command -a 'date +%F\ %T'
db1 | SUCCESS | rc=0 >>
2018-09-06 11:42:18

web1 | SUCCESS | rc=0 >>
2018-09-06 11:42:18

web2 | SUCCESS | rc=0 >>
2018-09-06 11:42:18
db2 | SUCCESS | rc=0 >>
2018-09-06 11:42:19
```

#### 4. 案例 4: 批量部署证书文件

#### 问题

# 本案例要求:

- 创建一对密钥
- 给所有主机部署密钥



#### • 步骤

实现此案例需要按照如下步骤进行。

#### 步骤一:批量部署证书文件,给所有主机部署密钥

1) 创建密钥

```
[root@ansible aaa]# cd /root/.ssh/
[root@ansible .ssh]# vi /etc/ansible/hosts
[web]
web1
web2

[db]
db[1:2]

[other]
cache
[root@ansible .ssh]# ansible all -m ping //直接 ping 会报错
[root@ansible .ssh]# ssh-keygen -t rsa -b 2048 -N '' //创建密钥
```

#### 2)给所有主机部署密钥

```
[root@ansible .ssh]# ansible all -m authorized_key -a "user=root exclusive=true
manage_dir=true key='$(< /root/.ssh/id_rsa.pub)'" -k</pre>
   SSH password:
   [root@ansible .ssh]# ansible all -m ping //成功
   web2 | SUCCESS => {
       "changed": false,
"ping": "pong"
   db2 | SUCCESS => {
       "changed": false,
       "ping": "pong"
   web1 | SUCCESS => {
       "changed": false,
       "ping": "pong"
   cache | SUCCESS => {
       "changed": false,
       "ping": "pong"
   db1 | SUCCESS => {
       "changed": false,
       "ping": "pong"
   [root@ansible .ssh]# ssh web1
   Last login: Thu Sep 6 11:49:00 2018 from 192.168.1.51
   [root@web1 ~]#
```

# 5. 案例 5: 练习模块

问题



#### 本案例要求:

练习使用 command, shell, raw, script 模块

#### 步骤

实现此案例需要按照如下步骤进行。

# 步骤一: 练习模块

```
//模块的手册,相当于 man
ansible-doc
ansible-doc -l
                 //列出所有模块
ansible-doc 模块名
                 //查看指定模块的帮助信息
```

1) ping 模块

```
[root@ansible .ssh]# ansible web1 -m ping
web1 | SUCCESS => {
    "changed": false,
    "ping": "pong"
```

#### 2) command 模块

```
[root@ansible .ssh]# ansible web1 -m command -a 'chdir=/tmp touch f1' //创建成功
[root@web1 ~]# cd /tmp/
[root@web1 tmp]# ls
                        //在 web1 上面查看
```

#### 3)shell 模块

```
[root@ansible .ssh]# ansible web1 -m shell -a 'chdir=/tmp touch f2' //创建成功
[root@web1 ~]# cd /tmp/
[root@web1 tmp]# ls //在web1上面查看
```

#### 4) raw 模块

```
[root@ansible .ssh]# ansible web1 -m raw -a 'chdir=/tmp touch f3'
//文件可以创建,但无法切换目录,文件在用户家目录下生成
web1 | SUCCESS | rc=0 >>
Shared connection to web1 closed.
[root@web1 tmp]# cd /root/
[root@web1 ~]# ls
```

#### 5) script 模块

对于太复杂的命令,可以写个脚本,然后用 script 模块执行

在 web1 主机上创建 zhangsan3 用户,修改 zhangsan3 的密码为 123456,设置 zhangsan3 第一次登陆必须修改密码

#### 用命令写:

```
[root@ansible .ssh]# ansible web1 -m shell -a 'useradd zhangsan3'
[root@ansible .ssh]# ansible web1 -m shell -a 'echo 123456 | passwd --stdin zhangsan3'
[root@ansible .ssh]# ssh -l zhangsan3 web1
```



```
zhangsan3@web1's password: //輸入 zhangsan3 的密码
[root@ansible .ssh]# ansible web1 -m shell -a 'chage -d 0 zhangsan3'
[root@ansible .ssh]# ssh -l zhangsan3 web1
```

#### 用脚本写, script 模块执行:

```
[root@ansible .ssh]# vim user.sh
   #!/bin/bash
   useradd zhangsan3
   echo 123456 | passwd --stdin zhangsan3
   chage -d 0 zhangsan3
   echo
   [root@ansible .ssh]# ansible web1 -m script -a './user.sh'
   web1 | SUCCESS => {
       "changed": true,
       "rc": 0,
       "stderr": "Shared connection to web1 closed.\r\n",
       "stdout": "Changing password for user zhangsan3.\r\npasswd: all authentication
tokens updated successfully.\r\n\r\n",
       "stdout_lines": [
           "Changing password for user zhangsan3.",
          "passwd: all authentication tokens updated successfully.",
    [root@ansible .ssh]# ssh -l lisi web1
   lisi@web1's password:
   You are required to change your password immediately (root enforced)
   Last login: Thu Sep 6 14:51:33 2018 from 192.168.1.51
   WARNING: Your password has expired.
   You must change your password now and login again!
   Changing password for user lisi.
   Changing password for lisi.
   (current) UNIX password:
```

#### 6.案例 6:模块练习

问题

# 本案例要求:

- 使用 copy 模块同步数据
- 使用 lineinfile 模块编辑文件
- 使用 replace 模块修改文件

#### 步骤

实现此案例需要按照如下步骤进行。

# 步骤一:模块练习

1)使用 copy 模块同步数据

src:要复制到进程主机的文件在本地的地址,可以是绝对路径,也可以是相对路径。如



果路径是一个目录,它将递归复制。在这种情况下,如果路径使用"/"来结尾,则只复制目录里的内容,如果没有使用"/"来结尾,则包含目录在内的整个内容全部复制,类似于 rsync

dest:必选项。进程主机的绝对路径,如果源文件是一个目录,那么该路径也必须是个目录

backup:在覆盖之前将原文件备份,备份文件包含时间信息。有两个选项:yes|noforce:如果目标主机包含该文件,但内容不同,如果设置为 yes,则强制覆盖,如果为no,则只有当目标主机的目标位置不存在该文件时,才复制。默认为 yes

```
[root@ansible .ssh]# ansible all -m shell -a 'cat /etc/resolv.conf'
   cache | SUCCESS | rc=0 >>
   ; generated by /usr/sbin/dhclient-script
   nameserver 192.168.1.254
   search localhost
   db2 | SUCCESS | rc=0 >>
   ; generated by /usr/sbin/dhclient-script
   nameserver 192.168.1.254
   search localhost
   web1 | SUCCESS | rc=0 >>
   ; generated by /usr/sbin/dhclient-script
   nameserver 192.168.1.254
   search localhost
   web2 | SUCCESS | rc=0 >>
   ; generated by /usr/sbin/dhclient-script
   nameserver 192.168.1.254
   search localhost
   db1 | SUCCESS | rc=0 >>
   ; generated by /usr/sbin/dhclient-script
   nameserver 192.168.1.254
   search localhost
   [root@ansible .ssh]# vi /etc/resolv.conf
   nameserver 172.40.1.10
   [root@ansible
                  .ssh]#
                            ansible all
                                                 сору
                                                       -a 'src=/etc/resolv.conf
                                            -m
dest=/etc/resolv.conf'
   [root@ansible .ssh]# ansible all -m shell -a 'cat /etc/resolv.conf'
   //查看有 nameserver 172.40.1.10
   [root@ansible ~]# mkdir aa
   [root@ansible ~]# ansible all -m copy -a 'src=/root/aa dest=/root/a.log'
   //复制本机的目录/root/aa 到其他机器的/root/a.log , 复制目录只能少数批量执行同步
   [root@ansible ~]# ansible all -m shell -a 'ls -ld /root'
   db2 | SUCCESS | rc=0 >>
   dr-xr-x---. 4 root root 167 Sep 6 11:48 /root
   web2 | SUCCESS | rc=0 >>
   dr-xr-x---. 4 root root 167 Sep 6 11:48 /root
   cache | SUCCESS | rc=0 >>
   dr-xr-x---. 4 root root 177 Sep 6 14:35 /root
   db1 | SUCCESS | rc=0 >>
   dr-xr-x---. 4 root root 167 Sep 6 11:48 /root
   web1 | SUCCESS | rc=0 >>
   dr-xr-x---. 4 root root 177 Sep 6 14:35 /root
```



#### 2)使用 lineinfile 模块编辑文件

以行为基础,整行修改(整行被替换掉)

```
[root@ansible ~]# ansible cache -m lineinfile \
-a 'path=/etc/sysconfig/network-scripts/ifcfg-eth0 \
regexp="^ONBOOT=" line="ONBOOT=\"no\""'

cache | SUCCESS => {
    "backup": "",
    "changed": true,
    "msg": "line replaced"
}
```

3)使用 replace 模块修改文件

修改文件的某一部分(替换一行中匹配的内容),以正则表达式匹配为基础修改

```
[root@ansible ~]# ansible cache -m replace -a \
    'path=/etc/sysconfig/network-scripts/ifcfg-eth0 \
    regexp="^(ONBOOT=).*" replace="\1\"yes\""'

cache | SUCCESS => {
      "changed": true,
      "msg": "1 replacements made"
}
```

# 7. 案例 7: 综合练习

#### 问题

# 本案例要求:

- 安装 Apache 并修改监听端口为 8080
- 修改 ServerName 配置, 执行 apachectl-t 命令不报错
- 设置默认主页 hello world
- 启动服务并设开机自启

实现此案例需要按照如下步骤进行。

#### 步骤一:熟悉模块

1) yum 模块

```
[root@ansible ~]# ansible other -m yum -a 'name="lrzsz" state=removed'
//lrzsz 软件包名, removed=absent 删除
[root@ansible ~]# ansible other -m yum -a 'name="lrzsz,lftp" state=installed'
//安装多个软件包,不写 state 默认为安装
```

# 2)service 模块

```
[root@ansible ~]# ansible other -m service -a 'name="sshd" enabled="yes" state="started"' //sshd 服务名,开机启动同时启动这个服务
```



#### 3) setup 模块

filter 过滤指定的关键字(可以过滤到我们需要的信息)

```
[root@ansible ~]# ansible cache -m setup -a 'filter=os'
cache | SUCCESS => {
    "ansible_facts": {},
    "changed": false
}
[root@ansible ~]# ansible cache -m setup -a 'filter=ansible_distribution'
cache | SUCCESS => {
    "ansible_facts": {
        "ansible_distribution": "CentOS"
    },
    "changed": false
}
```

#### 步骤二:安装 Apache

1)安装 Apache 服务设置开机自启

```
[root@ansible ~]# ansible cache -m yum -a 'name=httpd state=installed'
[root@ansible ~]# ansible cache -m service -a 'name=httpd enabled=yes state=started'
```

2) 修改端口号为 8080

```
[root@ansible ~]# ssh cache
Last login: Thu Sep 6 15:30:33 2018 from 192.168.1.51
[root@cache ~]# cat /etc/httpd/conf/httpd.conf | grep Listen
Listen 80
[root@ansible ~]# ansible cache -m lineinfile -a 'path="/etc/httpd/conf/httpd.conf"
regexp="^Listen " line="Listen 8080"'cache | SUCCESS => {
    "backup": "",
    "changed": true,
    "msg": "line replaced"
}
[root@ansible ~]# ssh cache
Listen 8080
```

#### 步骤三:修改 ServerName 配置, 执行 apachectl -t 命令不报错

1)没有修改之前

```
[root@cache ~]# apachectl -t //有报错
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 192.168.1.56. Set the 'ServerName' directive globally to suppress this message Syntax OK
```

#### 2)修改之后

```
[root@ansible ~]# ansible cache -m lineinfile -a 'path="/etc/httpd/conf/httpd.conf"
regexp="^ServerName " line="ServerName 0.0.0.0"'
    cache | SUCCESS => {
        "backup": "",
        "changed": true,
        "msg": "line added"
    }
    [root@ansible ~]# ssh cache
    Last login: Thu Sep 6 15:36:08 2018 from 192.168.1.51
    [root@cache ~]# apachectl -t
    Syntax OK
```

#### 步骤四:设置默认主页为 hello world



```
[root@ansible
                                                                  'src=/root/index.html
                     ~]#
                            ansible
                                       cache
                                                      сору
                                                             -a
dest=/var/www/html/index.html' ///root/index.html 这个页面可以自己写
    cache | SUCCESS => {
        "changed": true,
        "checksum": "22596363b3de40b06f981fb85d82312e8c0ed511",
        "dest": "/var/www/html/index.html",
        "gid": 0,
"group": "root",
"md5sum": "6f5902ac237024bdd0c176cb93063dc4",
        "mode": "0644",
"owner": "root",
        "size": 12,
        "src": "/root/.ansible/tmp/ansible-tmp-1536219767.29-30682157793478/source",
        "state": "file",
        "uid": 0
```