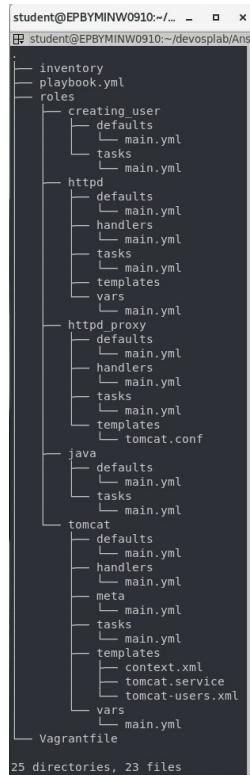


Lab Work Task. Day 2

Task

A) On Control Machine:

Create folder `~/ansible/day2`. All working files should be placed there (Vagrantfile, playbooks, roles folder with custom roles, inventory)



```
student@EPBYMINW0910:~/...  -  □ x
student@EPBYMINW0910:~/devosplab/Ansible
.
├── inventory
├── playbook.yml
└── roles
    ├── creating_user
    │   ├── defaults
    │   │   └── main.yml
    │   └── tasks
    │       └── main.yml
    ├── httpd
    │   ├── defaults
    │   │   └── main.yml
    │   ├── handlers
    │   │   └── main.yml
    │   ├── tasks
    │   │   └── main.yml
    │   ├── templates
    │   └── vars
    │       └── main.yml
    ├── http_proxy
    │   ├── defaults
    │   │   └── main.yml
    │   ├── handlers
    │   │   └── main.yml
    │   ├── tasks
    │   │   └── main.yml
    │   ├── templates
    │   └── tomcat.conf
    ├── java
    │   ├── defaults
    │   │   └── main.yml
    │   └── tasks
    │       └── main.yml
    └── tomcat
        ├── defaults
        │   └── main.yml
        ├── handlers
        │   └── main.yml
        ├── meta
        │   └── main.yml
        ├── tasks
        │   └── main.yml
        ├── templates
        │   └── context.xml
        │       ├── tomcat.service
        │       └── tomcat-users.xml
        └── vars
            └── main.yml
Vagrantfile
25 directories, 23 files
```

Picture 1

B) Spin up 2 VMs from single Vagrantfile. Compose Inventory:

- Specify groups;
- Define group vars;
- Define host vars;
- Define ansible connection settings (common for all hosts/groups in inventory).

```

student@EPBYMINW0910:~/devosplab/Ansible/Day02
File Edit View Search Terminal Help
# mode: ruby -*-  

# vi: set ft=ruby :  

Vagrant.configure("2") do |config|  

  # create webserver VM  

  config.vm.define "centos-webserver" do |webserver|  

    webserver.vm.box = "sbeliakou/centos"  

    webserver.vm.box_check_update = false  

    webserver.vm.network :private_network, ip: "178.65.0.5"  

    webserver.ssh.insert_key = false  

    webserver.vm.hostname = "webserver"  

    webserver.vm.provider "virtualbox" do |vb|  

      vb.name = "centos-webserver-day2"  

      vb.memory = "1024"  

    end  

  end  

  # create appserver VM  

  config.vm.define "centos-appserver" do |appserver|  

    appserver.vm.box = "sbeliakou/centos"  

    appserver.vm.box_check_update = false  

    appserver.vm.network :private_network, ip: "178.65.0.6"  

    appserver.ssh.insert_key = false  

    appserver.vm.hostname = "appserver"  

    appserver.vm.provider "virtualbox" do |vb|  

      vb.name = "centos-appserver-day2"  

      vb.memory = "2048"  

    end  

  end  

end

```

Picture 2 – Vagrantfile

```

student@EPBYMINW0910:~/devosplab/Ansible
File Edit View Search Terminal Help
[student@EPBYMINW0910 Ansible]$ cat ./Day02/inventory
[webservers]
http      ansible_host=178.65.0.5 ansible_connection=paramiko ansible_user={{ user_name }}

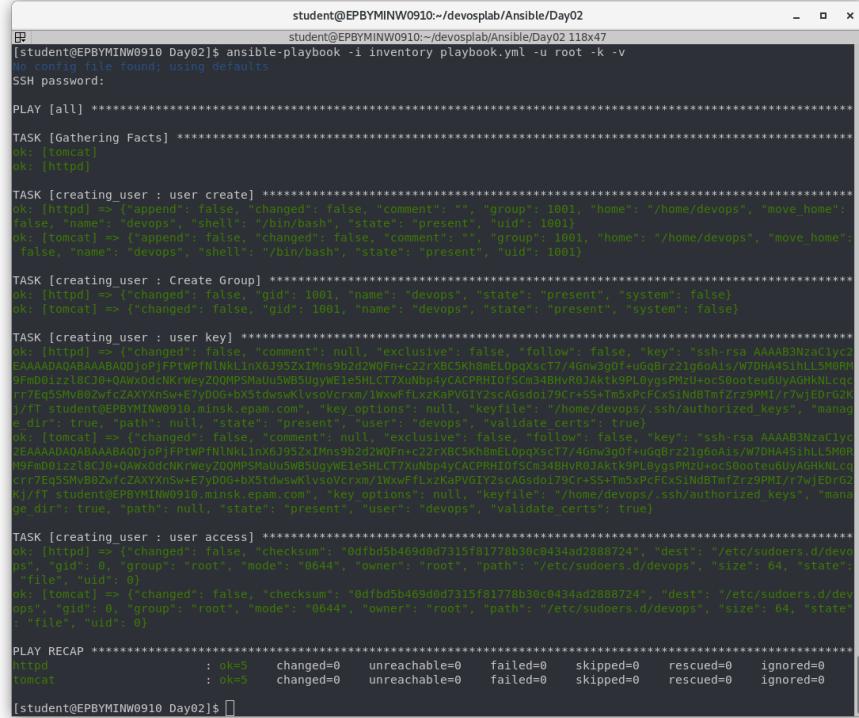
[appservers]
tomcat    ansible_host=178.65.0.6 ansible_connection=paramiko ansible_user={{ user_name }}
[student@EPBYMINW0910 Ansible]$ 

```

Picture 2.1 – cat inventory file

C) Develop following Roles:

- common (provides common system updates/configuration/so on);
- devops_user (creates “devops:devops” user, updates authorized keys file, configures sudoers, disables requiretty setting for this user);



```

student@EPBYMINW0910:~/devosplab/Ansible/Day02
[student@EPBYMINW0910 Day02]$ ansible-playbook -i inventory playbook.yml -u root -k -v
No config file found; using defaults
SSH password:
PLAY [all] ****
TASK [Gathering Facts] ****
ok: [tomcat]
ok: [httpd]

TASK [creating_user : user create] ****
ok: [httpd] => {"append": false, "changed": false, "comment": "", "group": 1001, "home": "/home/devops", "move_home": false, "name": "devops", "shell": "/bin/bash", "state": "present", "uid": 1001}
ok: [tomcat] => {"append": false, "changed": false, "comment": "", "group": 1001, "home": "/home/devops", "move_home": false, "name": "devops", "shell": "/bin/bash", "state": "present", "uid": 1001}

TASK [creating_user : Create Group] ****
ok: [httpd] => {"changed": false, "gid": 1001, "name": "devops", "state": "present", "system": false}
ok: [tomcat] => {"changed": false, "gid": 1001, "name": "devops", "state": "present", "system": false}

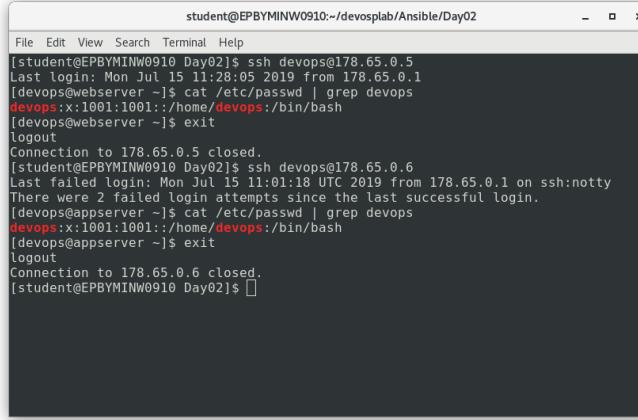
TASK [creating_user : user key] ****
ok: [httpd] => {"changed": false, "comment": null, "exclusive": false, "follow": false, "key": "ssh-rsa AAAAB3NzaC1yc2EAAQADQABAAQAD0iPjFPtWpFm1Hk1lnXh195Zx1Mns9b2d2M0Fn+22rXBC5Kh8mEl0p9scT7/4Gnw3p0f+u0qfrz210q0a1s/W7DHA451h1LSM0RM9Fn001zz18C10+04b00drMK/weyZ00M0SMal0u5Wb5lgyWe1e5HLCT7XNbpa4yCACPRH10FSCm34RHVR01AKtK9Pb0ygsPM2l+oc5h0tenu6lyAGHkNLcgr7eq5SMb007wfr2AXYYnSw+E7yD0G+0x5t0dswk1vso/crxm/1KwxFFLz2KaPGV1Y2scAGsd0179r+55+Tm5xPcFCx5S1d0Tef2r+9PM1/r7w)EDrG2kj/FT student@EPBYMINW0910 minsk eman com", "key options": null, "keyfile": "/home/devops/.ssh/authorized_keys", "manage_dir": true, "path": null, "state": "present", "user": "devops", "validate_certs": true}
ok: [tomcat] => {"changed": false, "comment": null, "exclusive": false, "follow": false, "key": "ssh-rsa AAAAB3NzaC1yc2EAAQADQABAAQAD0iPjFPtWpFm1Hk1lnXh195Zx1Mns9b2d2M0Fn+22rXBC5Kh8mEl0p9scT7/4Gnw3p0f+u0qfrz210q0a1s/W7DHA451h1LSM0RM9Fn001zz18C10+04b00drMK/weyZ00M0SMal0u5Wb5lgyWe1e5HLCT7XNbpa4yCACPRH10FSCm34RHVR01AKtK9Pb0ygsPM2l+oc5h0tenu6lyAGHkNLcgr7Eq5SMb007wfr2AXYYnSw+E7yD0G+0x5t0dswk1vso/crxm/1KwxFFLz2KaPGV1Y2scAGsd0179r+55+Tm5xPcFCx5S1d0Tef2r+9PM1/r7w)EDrG2kj/FT student@EPBYMINW0910 minsk eman com", "key options": null, "keyfile": "/home/devops/.ssh/authorized_keys", "manage_dir": true, "path": null, "state": "present", "user": "devops", "validate_certs": true}

TASK [creating_user : user access] ****
ok: [httpd] => {"changed": false, "checksum": "0fdb5b469d0d7315f81778b30c0434ad2888724", "dest": "/etc/sudoers.d/devops", "gid": 0, "group": "root", "mode": "0644", "owner": "root", "path": "/etc/sudoers.d/devops", "size": 64, "state": "file", "uid": 0}
ok: [tomcat] => {"changed": false, "checksum": "0fdb5b469d0d7315f81778b30c0434ad2888724", "dest": "/etc/sudoers.d/devops", "gid": 0, "group": "root", "mode": "0644", "owner": "root", "path": "/etc/sudoers.d/devops", "size": 64, "state": "file", "uid": 0}

PLAY RECAP ****
httpd      : ok=5    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
tomcat    : ok=5    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

```

Picture 3.1



```

student@EPBYMINW0910:~/devosplab/Ansible/Day02
[student@EPBYMINW0910 Day02]$ ssh devops@178.65.0.5
Last login: Mon Jul 15 11:28:05 2019 from 178.65.0.1
[devops@webserver ~]$ cat /etc/passwd | grep devops
devops:x:1001:1001:/home/devops:/bin/bash
[devops@webserver ~]$ exit
logout
Connection to 178.65.0.5 closed.
[student@EPBYMINW0910 Day02]$ ssh devops@178.65.0.6
Last failed login: Mon Jul 15 11:01:18 UTC 2019 from 178.65.0.1 on ssh:notty
There were 2 failed login attempts since the last successful login.
[devops@appserver ~]$ cat /etc/passwd | grep devops
devops:x:1001:1001:/home/devops:/bin/bash
[devops@appserver ~]$ exit
logout
Connection to 178.65.0.6 closed.
[student@EPBYMINW0910 Day02]$ 

```

Picture 3.2 – Proof

- java (installs java, verifies java installation; supports java version customization);

Picture 3.3

Picture 3.4

```
devops@appserver:~ - 118x32
[student@EPBYMINW0910 Day02]$ ssh devops@178.65.0.6
Last login: Mon Jul 15 11:54:47 2019 from 178.65.0.1
[devops@appserver:~]$ java -version
openjdk version "1.8.0_212"
OpenJDK Runtime Environment (build 1.8.0_212-b04)
OpenJDK 64-Bit Server VM (build 25.212-b04, mixed mode)
[devops@appserver -]$ 
```

Picture 3.5 – Check Java version on appserver

- tomcat (installs tomcat from sources - war, creates tomcat user with custom uid, creates tomcat user's group with custom gid, configures systemd to start tomcat automatically, verifies tomcat installation; supports tomcat customization: JAVA_OPTS, version, etc; role has dependency on java role);

```
student@EPBYMINW0910:~/devosplab/Ansible/Day02
student@EPBYMINW0910:~/devosplab/Ansible/Day02 118x32
TASK [Gathering Facts] ****
  ok: [tomcat]

TASK [tomcat : tomcat download] ****
  ok: [tomcat] => {"changed": false, "checksum_src": null, "checksum_dest": null, "dest": "/home/devops/apache-tomcat-8.5.42.tar.gz", "elapsed": 0, "gid": 1002, "group": "tomcat", "mode": "0644", "msg": "file already exists", "owner": "tomcat", "size": 971748, "state": "file", "uid": 1002, "url": "http://ftp.byfly.by/pub/apache.org/tomcat/tomcat-8/v8.5/2/bin/apache-tomcat-8.5.42.tar.gz"}

TASK [tomcat : tomcat unarchive] ****
  changed: [tomcat] => {"changed": true, "dest": "/opt/", "extract_results": {"cmd": "/usr/bin/gtar", "-extract", "-C", "/opt", "-z", "-f", "/home/devops/apache-tomcat-8.5.42.tar.gz"}, "err": "", "out": "", "rc": 0, "gid": 0, "group": "root", "handter": "tgzArchive", "mode": "0755", "owner": "root", "size": 66, "src": "/home/devops/apache-tomcat-8.5.42.tar.gz", "state": "directory", "uid": 0}

TASK [tomcat : tomcat shell operation] ****
  changed: [tomcat] => {"changed": true, "cmd": "groupadd tomcat\nuseradd -g tomcat -d /opt/apache-tomcat-8.5.42 -s /bin/nologin tomcat\nchown -R tomcat:tomcat /opt/apache-tomcat-8.5.42\n\nexport CATALINA_HOME=/opt/apache-tomcat-8.5.42\n", "delta": "0:00:00.011728", "end": "2019-07-15 12:39:26.016252", "rc": 0, "start": "2019-07-15 12:39:26.604524", "stderr": "groupadd: group 'tomcat' already exists\nuseradd: user 'tomcat' already exists", "stdout": "", "stdout_lines": []}

TASK [tomcat : tomcat web-user settings] ****
  changed: [tomcat] => {"backup_file": "/opt/apache-tomcat-8.5.42/conf/tomcat-users.xml.30350", "dest": "/opt/apache-tomcat-8.5.42/conf/tomcat-users.xml", "gid": 1002, "group": "tomcat", "md5sum": "0e5cdbe7d4a57d0e641a2a66ec686b1b571e0d", "owner": "tomcat", "size": 441, "src": "/root/.ansible/tmp/1563194366.78-233282676304749/source", "state": "file", "uid": 1002}

TASK [tomcat : tomcat context.xml setup changes] ****
  changed: [tomcat] => {"backup_file": "/opt/apache-tomcat-8.5.42/webapps/manager/META-INF/context.xml.30445", "dest": "/opt/apache-tomcat-8.5.42", "changed": true, "checksum": "d5099b03f7bcddaa5b5410a3ad6d48e64a7c8488", "dest": "/opt/apache-tomcat-8.5.42", "err": "", "out": "", "rc": 0, "size": 15, "src": "/root/.ansible/tmp/1563194366.78-233282676304749/source", "state": "file", "uid": 1002}
```

Picture 3.6

```
student@EPBYMINW0910:~/devosplab/Ansible/Day02
student@EPBYMINW0910:~/devosplab/Ansible/Day02 118x32
[student@EPBYMINW0910:~/devosplab/Ansible/Day02] errors=0, start_time=[Mon 2019-07-15 12:35:47 UTC], stop_time=[Mon 2019-07-15 12:39:48 UTC], pid=29515, code=exited; status=0 ; FailureAction="none"; FileDescriptorStoreMax="0"; FragmentPath="/etc/systemd/system/tomcat.service"; Group="tomcat"; GuessMainPID="0"; Id="tomcat.service"; IgnoreInIsolate="0"; IgnoreOnSnapshot="no"; IgnoresIGPPE="yes"; InactiveDeadlineTimestamp="Mon 2019-07-15 12:35:48 UTC"; InactiveEnterTimestampMonotonic="9406802341"; InactiveExitTimestampMonotonic="18446744073709551615"; JobTimeoutAction="none"; JustTimeoutSec="0"; KillMode="control_group"; LimitCPU="18446744073709551615"; LimitDATA="18446744073709551615"; LimitCORE="18446744073709551615"; LimitFSIZE="18446744073709551615"; LimitLOCKS="18446744073709551615"; LimitNOFILE="4096"; LimitNPROC="7260"; LimitRSS="18446744073709551615"; LimitRTPRIO="0"; LimitRTIME="18446744073709551615"; LimitSIGPENDING="7260"; LimitSTACK="18446744073709551615"; LoadState="29564"; MemoryAccounting="no"; MemoryCurrent="18446744073709551615"; MemoryLimit="18446744073709551615"; MountFlags="0"; Names="tomcat.service"; NeedDaemonReload="no"; Nice="0"; NoNewPrivileges="no"; NoNodocking="no"; NotifyAccess="none"; NoScoreAdjust="0"; OnFailureJobMode="replace"; PermissionsStartOnly="no"; PrivateDevices="no"; PrivateNetwork="no"; PrivateTmp="no"; ProtectHome="no"; ProtectSystem="no"; RefuseManualStart="no"; RefuseManualStop="no"; Requires="basic.target"; Restart="on-failure"; RestartSec="100ms"; Result="success"; RootDirectoryStartOnly="no"; RuntimeDirectoryMode="0755"; SameProcessGroup="no"; SecureBits="0"; SendsIGRUP="no"; SendsSIGKILL="yes"; Slice="system.slice"; StandardError="inherit"; StandardInput="null"; StandardOutput="journal"; StartLimitAction="none"; StartLimitBurst="5"; StartLimitInterval="1000000"; StartupBlockIOWeight="18446744073709551615"; StartupCPUShares="18446744073709551615"; StatusErrno="0"; StopWhenUnloaded="no"; SubState="running"; SyslogLevelPref="yes"; SyslogPriority="30"; SystemCallErrNumber="0"; TTYReset="no"; TTYVHangup="no"; TTYVTDIsAllocate="no"; TasksAccounting="no"; TasksCurrent="18446744073709551615"; TasksMax="18446744073709551615"; TimeoutStartSec="1min 30s"; TimeoutStopSec="1min 30s"; TimerSlackNsec="50000"; Transient="no"; Type="forking"; UMask="0622"; UnitFilePreset="disabled"; UnitFileState="enabled"; User="tomcat"; WantedBy="multi-user.target"; Wants="system.slice"; WatchdogTimestampMonotonic="94068184608"; WatchdogUseSec="0"]

PLAY RECAP ****
httpd : ok=5    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
tomcat : ok=14   changed=6    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
[student@EPBYMINW0910 Day02]$
```

Picture 3.7

```
student@EPBYMINW0910:~/devosplab/Ansible/Day02
student@EPBYMINW0910:~/devosplab/Ansible/Day02 116x34
TASK [tomcat : tomcat shell operation] ****
  changed: [tomcat] => {"changed": true, "cmd": "groupadd tomcat\nuseradd -g tomcat -d /opt/apache-tomcat-8.5.42 -s /bin/nologin tomcat\nchown -R tomcat:tomcat /opt/apache-tomcat-8.5.42\n\nexport CATALINA_HOME=/opt/apache-tomcat-8.5.42\n", "delta": "0:00:00.010279", "end": "2019-07-16 12:47.071792", "group": "tomcat", "md5sum": "0168f9ece9d4648e64a7c8488", "owner": "tomcat", "size": 312, "src": "/root/.ansible/tmp/1563281226.27-255948394651855/source", "state": "file", "uid": 1002}

TASK [tomcat : tomcat web-user settings] ****
  changed: [tomcat] => {"backup_file": "/opt/apache-tomcat-8.5.42/conf/tomcat-users.xml.1540", "dest": "/opt/apache-tomcat-8.5.42/conf/tomcat-users.xml", "gid": 1002, "group": "tomcat", "md5sum": "0168f9ece9d4648e64a7c8488", "owner": "tomcat", "size": 15, "src": "/root/.ansible/tmp/1563281226.27-255948394651855/source", "state": "file", "uid": 1002}

TASK [tomcat : tomcat context.xml setup changes] ****
  changed: [tomcat] => {"backup_file": "/opt/apache-tomcat-8.5.42/webapps/manager/META-INF/context.xml.1030", "dest": "/opt/apache-tomcat-8.5.42/webapps/manager/META-INF/context.xml", "gid": 1002, "group": "tomcat", "md5sum": "0168f9ece9d4648e64a7c8488", "owner": "tomcat", "size": 312, "src": "/root/.ansible/tmp/1563281227.25-125603612438493/source", "state": "file", "uid": 1002}

TASK [tomcat : tomcat JAVA_OPTS] ****
  changed: [tomcat] => {"changed": true, "cmd": "echo $JAVA_OPTS", "delta": "0:00:00.003172", "end": "2019-07-16 12:47:47", "group": "tomcat", "md5sum": "0168f9ece9d4648e64a7c8488", "owner": "tomcat", "size": 1, "src": "-Xms128m -Xmx512m -server", "state": "file", "uid": 1002}
```

Picture 3.8 – JAVA_OPTS



```

student@EPBYMINW0910:~/devosplab/Ansible/Day02
student@EPBYMINW0910:~/devosplab/Ansible/Day02 116x34
path": "/etc/sudoers.d/devops", "size": 60, "state": "file", "uid": 0
PLAY [appservers] ****
TASK [Gathering Facts] ****
ok: [tomcat]
TASK [java : java installation] ****
ok: [tomcat] => {"changed": false, "msg": "", "rc": 0, "results": {"1:java-1.8.0-openjdk-1.8.0.212.b04-0.el7_6.x86_64": {"changed": true, "cmd": "echo $JAVA_HOME", "delta": "0:00:00.002737", "end": "2019-07-16 12:47: 0", "stderr_lines": [], "stdout": "/usr/bin/java", "stdout_lines": ["/usr/bin/java"]}}

```

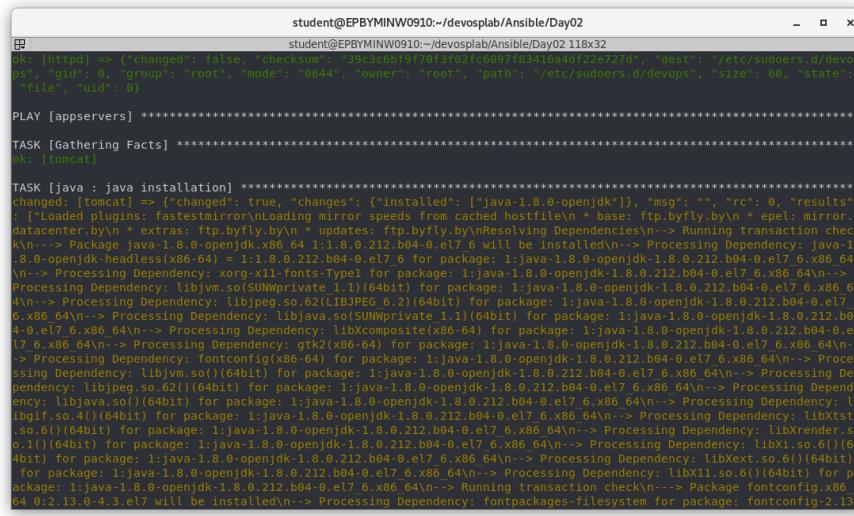
Picture 3.8 – JAVA_HOME

Add JAVA to /role/tomcat/meta/main.yml

```

dependencies:
- role: java
  java_version: 1.8.0

```



```

student@EPBYMINW0910:~/devosplab/Ansible/Day02
student@EPBYMINW0910:~/devosplab/Ansible/Day02 118x32
ok: [httpd] => {"changed": false, "checksum": "39c5c0079170131621c00971a310a0122e27d", "dest": "/etc/sudoers.d/devops", "gid": 0, "group": "root", "mode": "0644", "owner": "root", "path": "/etc/sudoers.d/devops", "size": 60, "state": "file", "uid": 0}
PLAY [appservers] ****
TASK [Gathering Facts] ****
ok: [tomcat]
TASK [java : java installation] ****
changed: [tomcat] => {"changed": true, "changes": {"installed": ["java-1.8.0-openjdk"], "msg": "", "rc": 0, "results": {"1:java-1.8.0-openjdk": {"checksum": "39c5c0079170131621c00971a310a0122e27d", "dest": "/etc/sudoers.d/devops", "gid": 0, "group": "root", "mode": "0644", "owner": "root", "path": "/etc/sudoers.d/devops", "size": 60, "state": "file", "uid": 0}}}

```

Picture 3.8

- httpd (installs apache httpd service, forwards requests to tomcat through custom VirtualHost, verifies http installation and running state).

```
student@EPBYMINW0910:~/devosplab/Ansible/Day02
student@EPBYMINW0910:~/devosplab/Ansible/Day02 118x32
:tus=0/0 )", "ExecStop": "{ path=/bin/kill ; argv[0]=/bin/kill -WINCH ${MAINPID} ; ignore_errors=no ; start_time=[in/a] ; stop_time=[in/a] ; pid=0 ; code=(multi) ; status=0/0 }", "FailureAction": "none", "FileDescriptorStoreMax": "0", "FragmentPath": "/usr/lib/systemd/system/httpd.service", "GuessMainPID": "yes", "IOScheduline": "0", "Id": "httpd.service", "IgnoreOnIsolate": "no", "IgnoreOnSnapshot": "no", "IgnoreSIGPOLL": "yes", "InactiveEnterTimestampMonotonic": "0", "InactiveExitTimestamp": "Mon 2019-07-15 14:30:13 UTC", "InactiveExitTimestampMonotonic": "4658446544", "JobTimeoutAction": "none", "JobTimeoutUnitSec": "0", "KillMode": "control-group", "KillSignal": "18", "LimitAS": "18446744073709551615", "LimitCORE": "18446744073709551615", "LimitCPU": "18446744073709551615", "LimitDATA": "18446744073709551615", "LimitFDS": "18446744073709551615", "LimitMEMLOCK": "65536", "LimitHQUEUE": "819200", "LimitNICE": "0", "LimitNOFILE": "4096", "LimitINPROC": "3872", "LimitRSS": "18446744073709551615", "LimitRPIO": "0", "LimitRTTIME": "18446744073709551615", "LimitSIGPENDING": "3872", "LimitsTACK": "18446744073709551615", "LoadState": "loaded", "MainPID": "22384", "MemoryAccounting": "no", "MemoryCurrent": "18446744073709551615", "MemoryLimit": "18446744073709551615", "MountFlags": "0", "Names": "httpd.service", "NeedDaemonReload": "no", "Nice": "0", "NoNewPrivileges": "no", "NonBlocking": "no", "NotifyAccess": "main", "OOMScoreAdjust": "0", "OnFailureJobMode": "replace", "PermissionsStartOnly": "no", "PrivateDevices": "no", "PrivateNetwork": "no", "PrivateTmp": "yes", "ProtectHome": "no", "ProtectSystem": "no", "RefuseManualStart": "no", "RefuseManualStop": "no", "RemainAfterExit": "no", "Requires": "basic.target", "RequiresMountsFor": "/var/tmp", "Restart": "no", "RestartSec": "100ms", "Result": "success", "RootDirectoryStartOnly": "no", "RuntimeDirectoryMode": "0755", "SameProcessGroup": "no", "SecureBits": "0", "SendSIGHUP": "no", "SendSIGKILL": "yes", "Slice": "system.slice", "StandardInput": "null", "StandardOutput": "journal", "StartLimitAction": "none", "StartLimitBurst": "5", "StartLimitInterval": "10000000", "StartupBlockIOWeight": "18446744073709551615", "StartupCPUShares": "18446744073709551615", "StatusErrno": "0", "StatusText": "Processing requests...", "StopWhenUnneeded": "no", "SubState": "running", "SyslogLevelPrefix": "yes", "SyslogPriority": "30", "SystemCallErrorNumber": "0", "TTYReset": "no", "TTYVHangup": "no", "TasksAllocate": "no", "TasksAccounting": "no", "TasksCurrent": "18446744073709551615", "TasksMax": "18446744073709551615", "TimeoutStartSec": "1min 30s", "TimeoutStopUsec": "1min 30s", "TimerSlackNsec": "50000", "Transient": "no", "Type": "notify", "UMask": "0022", "UnitFilePreset": "disabled", "UnitFilestate": "enabled", "WantedBy": "multi-user.target", "Wants": "system.slice", "WatchdogTimestamp": "Mon 2019-07-15 14:30:13 UTC", "WatchdogTimestampMonotonic": "4658477919", "WatchdogUsec": "0"}}
PLAY RECAP ****
httpd : ok=10 changed=3 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
tomcat : ok=15 changed=5 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
[student@EPBYMINW0910 Day02]$ 
```

Picture 3.8

```
devops@webserver:~ devops@webserver:~ 118x32
[student@EPBYMINW0910 Day02]$ ssh devops@178.65.0.1
Last login: Mon Jul 15 14:31:30 2019 from 178.65.0.1
[devops@webserver ~]$ sudo cat /etc/httpd/conf.d/tomcat.conf
<VirtualHost *:80>

ProxyPreserveHost On
ProxyPass / http://178.65.0.6:8080/
ProxyPassReverse / http://178.65.0.6:8080/
</VirtualHost>
[devops@webserver ~]$ sudo systemctl status httpd
● httpd.service - The Apache HTTP Server
  Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disabled)
  Active: active (running) since Mon 2019-07-15 14:30:15 UTC; 1min 36s ago
    Docs: man:htpd(8)
          man:apachectl(8)
  Process: 22452 ExecStop=/bin/kill -WINCH ${MAINPID} (code=exited, status=0/SUCCESS)
 Main PID: 22457 (httpd)
 Status: "Total requests: 2; Current requests/sec: 0; Current traffic: 0 B/sec"
 CGroup: /system.slice/httpd.service
         └─22457 /usr/sbin/httpd -DFOREGROUND
              ├─22458 /usr/sbin/httpd -DFOREGROUND
              ├─22459 /usr/sbin/httpd -DFOREGROUND
              ├─22460 /usr/sbin/httpd -DFOREGROUND
              ├─22461 /usr/sbin/httpd -DFOREGROUND
              ├─22462 /usr/sbin/httpd -DFOREGROUND
              └─22472 /usr/sbin/httpd -DFOREGROUND

Jul 15 14:30:15 webserver systemd[1]: Stopped The Apache HTTP Server.
Jul 15 14:30:15 webserver systemd[1]: Starting The Apache HTTP Server...
```

Picture 3.8 – Check proxy settings and service stratus

Not secure | 178.65.0.5

Home Documentation Configuration Examples Wiki Mailing Lists Find Help

Apache Tomcat/8.5.42

If you're seeing this, you've successfully installed Tomcat. Congratulations!



Recommended Reading:

- [Security Considerations HOW-TO](#)
- [Manager Application HOW-TO](#)
- [Clustering/Session Replication HOW-TO](#)

Server Status Manager App Host Manager

Developer Quick Start

Tomcat Setup	Realms & AAA	Examples	Servlet Specifications
First Web Application	JDBC DataSources		Tomcat Versions

Managing Tomcat

For security, access to the [manager webapp](#) is restricted. Users are defined in: [\\$CATALINA_HOME/conf/tomcat-users.xml](#)

In Tomcat 8.5 access to the manager application is split between different users. [Read more...](#)

Release Notes

Changelog

Migration Guide

Security Notices

Documentation

- [Tomcat 8.5 Documentation](#)
- [Tomcat 8.5 Configuration](#)
- [Tomcat Wiki](#)

Find additional important configuration information in: [\\$CATALINA_HOME/RUNNING.txt](#)

Developers may be interested in:

- [Tomcat 8.5 Bug Database](#)
- [Tomcat 8.5 JavaDocs](#)
- [Tomcat 8.5 SVN Repository](#)

Getting Help

FAQ and Mailing Lists

The following mailing lists are available:

tomcat-announce Important announcements, releases, security vulnerability notifications. (Low volume).
tomcat-users User support and discussion
taglibs-user User support and discussion for Apache Taglibs
tomcat-dev Development mailing list, including commit messages

Other Downloads

- [Tomcat Connectors](#)
- [Tomcat Native](#)
- [Taglibs](#)
- [Deployer](#)

Other Documentation

- [Tomcat Connectors](#)
- [mod_jk Documentation](#)
- [Tomcat Native](#)
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- [Apache Home](#)
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Picture 3.9 – Check results

D) Make sure that all necessary application state changes are being done with handlers on demand.

Picture 4.1

```
student@EPBYMINW0910:~/devopsplab/Ansible/Day02/roles/tomcat/tasks
File Edit View Search Terminal Help
notify: restart apache tomcat

- name: tomcat context.xml setup changes
  template:
    src: context.xml
    dest: "{{ tomcat_home }}/webapps/manager/META-INF/"
    backup: yes
notify: restart apache tomcat

- name: tomcat servise create
  template:
    src: tomcat.service
    dest: /etc/systemd/system/
  become: yes
  become_user: root

- name: tomcat service enable
  service:
    name: tomcat
    state: started
    enabled: yes
  become: yes
  become_user: root

32,31
Bot
```

Picture 4.2

And httpd handlers you may see in /role/httpd/handlers/main.yml

```
devops@webserver:~
```

devops@webserver:~ 118x32

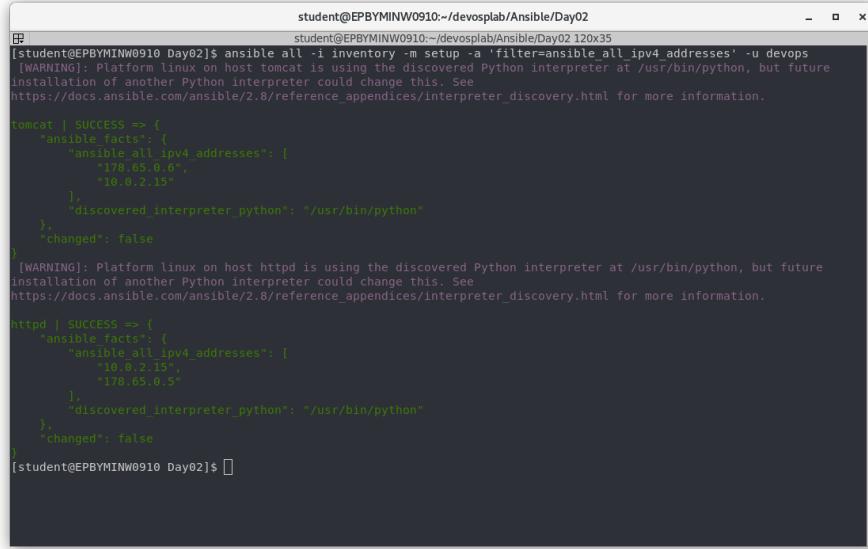
```
[P] devops@webserver:~ 118x32
", "TasksAccounting": "no", "TasksCurrent": "18446744073709551615", "TasksMax": "18446744073709551615", "TimeoutStartUseSec": "1min 30s", "TimeoutStopUseSec": "1min 30s", "TimerLastClockSec": "50000", "Transient": "no", "Type": "notify", "UnitFileMonitic": "0022", "UnitFilePreset": "disabled", "UnitfileState": "disabled", "Wants": "system.slice", "WatchdogTimestampMonotonic": "0", "WatchdogUseSec": "0"})

RUNNING HANDLER [httpd : restart httpd] *****
changed: [httpd => {"changed": true, "name": "httpd", "state": "started", "status": "(ActiveEnterTimestampMonotonic: "Mon 2019-07-15 14:30:13 UTC", "ActiveEnterTimestampMonotonic": "4658477944", "ActiveExitTimestampMonotonic": "0", "ActiveStatuse": "active", "After": "/tmp.mount network.target -> mount systemd-journald.socket systemd.slice basic.target remote-fs.target nss-lookup.target", "AllowIsolate": "0", "AmbientCapabilities": "0", "AssertResult": "yes", "AssertTimestamp": "Mon 2019-07-15 14:30:13 UTC", "AssertTimestampMonotonic": "4658445958", "Before": "/shutdown.target multi-user.target", "BlockIOAccounting": "no", "BlockIOWeight": "18446744073709551615", "CPUAccounting": "no", "CPUQuotaPerSecUseSec": "infinity", "CPUSchedulingPolicy": "0", "CPUSchedulingPriority": "0", "CPUSchedulingResetOnFork": "no", "CPUSHares": "18446744073709551615", "CanIsolate": "no", "CanReload": "yes", "CanStart": "yes", "CanStop": "yes", "CapabilityBoundingSet": "18446744073709551615", "ConditionResult": "yes", "ConditionTimestamp": "Mon 2019-07-15 14:30:13 UTC", "ConditionTimestampMonotonic": "4658445957", "Conflicts": "shutdown.target", "ControlGroup": "/system.slice/httpd.service", "ControlPID": "0", "DefaultDependencies": "yes", "Delegate": "no", "Description": "The Apache HTTP Server", "DevicePolicy": "auto", "Documentation": "man:htpd(8) man:apachectl(8)", "EnvironmentFile": "/etc/sysconfig/httpd (ignore_errors=no)", "ExecMain": "Code": "0", "ExecMainExitTimestampMonotonic": "0", "ExecMainPID": "2284", "ExecMainStartTimestamp": "Mon 2019-07-15 14:30:13 UTC", "ExecMainStartTimestampMonotonic": "4658445957", "ExecMainStatus": "0", "ExecReload": "[ {path: /usr/sbin/httpd ; argv[0]=/usr/sbin/httpd ; OPTIONS: -k graceful ; ignore_errors=no ; start_time=[n/a] ; stop_time=[n/a] ; pid_file:[null] ; status=0/o } ]", "ExecStart": "[ {path: /usr/sbin/httpd ; argv[0]=/usr/sbin/httpd ; OPTIONS: -DFOREGROUND ; ignore_errors=no ; start_time=[Mon 2019-07-15 14:30:13 UTC] ; stop_time=[n/a] ; pid_file:[null] ; code:[null] ; status=0/o } ]", "ExecStop": "[ {path: /bin/kill ; argv[0]=${MAINPID} ; ignore_errors=no ; start_time=[n/a] ; stop_time=[n/a] ; pid_file:[null] ; code:[null] ; status=0/o } ]", "FailureAction": "none", "FileDescriptorStoreMax": "0", "Fragm
```

Picture 4.3 – Restart service after change proxy configs

E) All roles should leave facts about configured/provisioned software on the system (Verify system's configuration with ad-hoc command – setup module - after provisioning)

```
$ ansible all -i inventory -m setup -a 'filter=ansible_all_ipv4_addresses' -u devops
```



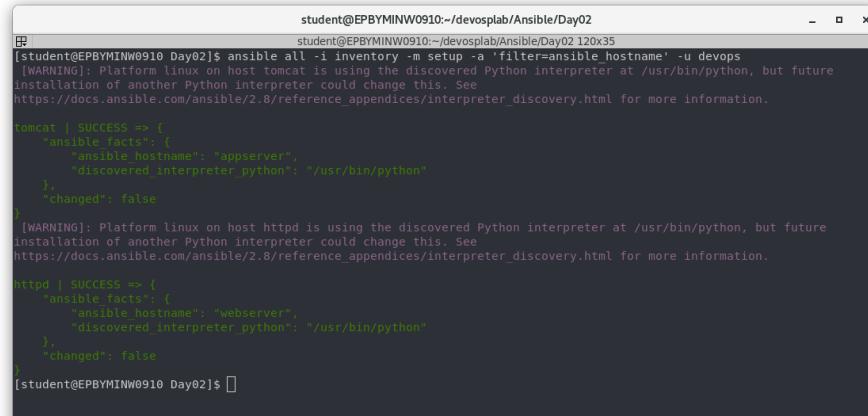
```
student@EPBYMINW0910:~/devosplab/Ansible/Day02
[student@EPBYMINW0910 Day02]$ ansible all -i inventory -m setup -a 'filter=ansible_all_ipv4_addresses' -u devops
[WARNING]: Platform linux on host tomcat is using the discovered Python interpreter at /usr/bin/python, but future
installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.8/reference_appendices/interpreter_discovery.html for more information.

tomcat | SUCCESS => {
  "ansible_facts": {
    "ansible_all_ipv4_addresses": [
      "178.65.0.6",
      "10.0.2.15"
    ],
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
[WARNING]: Platform linux on host httpd is using the discovered Python interpreter at /usr/bin/python, but future
installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.8/reference_appendices/interpreter_discovery.html for more information.

httpd | SUCCESS => {
  "ansible_facts": {
    "ansible_all_ipv4_addresses": [
      "10.0.2.15",
      "178.65.0.5"
    ],
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
[student@EPBYMINW0910 Day02]$
```

Picture 5.1 – IPv4 addresses

```
$ ansible all -i inventory -m setup -a 'filter=ansible_hostname' -u devops
```



```
student@EPBYMINW0910:~/devosplab/Ansible/Day02
[student@EPBYMINW0910 Day02]$ ansible all -i inventory -m setup -a 'filter=ansible_hostname' -u devops
[WARNING]: Platform linux on host tomcat is using the discovered Python interpreter at /usr/bin/python, but future
installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.8/reference_appendices/interpreter_discovery.html for more information.

tomcat | SUCCESS => {
  "ansible_facts": {
    "ansible_hostname": "appserver",
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
[WARNING]: Platform linux on host httpd is using the discovered Python interpreter at /usr/bin/python, but future
installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.8/reference_appendices/interpreter_discovery.html for more information.

httpd | SUCCESS => {
  "ansible_facts": {
    "ansible_hostname": "webserver",
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
[student@EPBYMINW0910 Day02]$
```

Picture 5.2 – Hostname

```
$ ansible all -i inventory -m setup -a 'filter=ansible_processor' -u devops
```

```

student@EPBYMINW0910:~/devosplab/Ansible/Day02
student@EPBYMINW0910:~/devosplab/Ansible/Day02 120x35
https://docs.ansible.com/ansible/2.8/reference_appendices/interpreter_discovery.html for more information.

tomcat | SUCCESS => {
  "ansible_facts": {
    "ansible_processor": [
      "0",
      "GenuineIntel",
      "Intel(R) Core(TM) i5-4570 CPU @ 3.20GHz",
      "1",
      "GenuineIntel",
      "Intel(R) Core(TM) i5-4570 CPU @ 3.20GHz"
    ],
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
[WARNING]: Platform linux on host httpd is using the discovered Python interpreter at /usr/bin/python, but future
installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.8/reference_appendices/interpreter_discovery.html for more information.

httpd | SUCCESS => {
  "ansible_facts": {
    "ansible_processor": [
      "0",
      "GenuineIntel",
      "Intel(R) Core(TM) i5-4570 CPU @ 3.20GHz",
      "1",
      "GenuineIntel",
      "Intel(R) Core(TM) i5-4570 CPU @ 3.20GHz"
    ],
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
[student@EPBYMINW0910 Day02]$ 

```

Picture 5.3 – Processor

```
$ ansible all -i inventory -m setup -a 'filter=ansible_processor_cores' -u devops
```

```

student@EPBYMINW0910:~/devosplab/Ansible/Day02
student@EPBYMINW0910:~/devosplab/Ansible/Day02 120x35
https://docs.ansible.com/ansible/2.8/reference_appendices/interpreter_discovery.html for more information.

tomcat | SUCCESS => {
  "ansible_facts": {
    "ansible_processor_cores": 2,
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
[WARNING]: Platform linux on host httpd is using the discovered Python interpreter at /usr/bin/python, but future
installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.8/reference_appendices/interpreter_discovery.html for more information.

httpd | SUCCESS => {
  "ansible_facts": {
    "ansible_processor_cores": 2,
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
[student@EPBYMINW0910 Day02]$ 

```

Picture 5.4 – Number processor cores

F) Develop provision.yml playbook:

- Sections `pre_tasks`, `tasks`, `roles`, `post_tasks`;

```

TASK [install net-tools] ****
ok: [httpd] => [changed=False, "msg": "", "rc": 0, "results": [{"net-tools-2.0-0.24.20131004git.el7.x86_64 providing net-tools is already installed"}]
ok: [tomcat] => [changed=False, "msg": "", "rc": 0, "results": [{"net-tools-2.0-0.24.20131004git.el7.x86_64 providing net-tools is already installed"}]]
TASK [creating_user : user create] ****

```

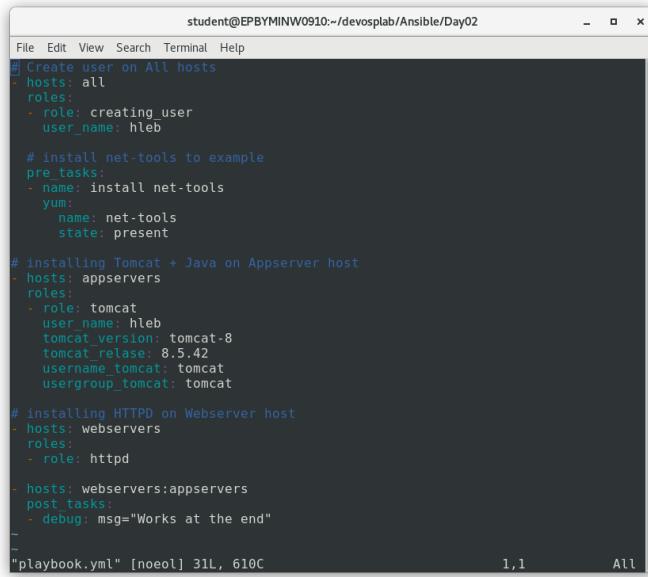
Picture 6.1 – Pre_tasks install net-tools

```
TASK [debug] ****
ok: [httpd] => {
    "msg": "Works at the end"
}
ok: [tomcat] => {
    "msg": "Works at the end"
}

PLAY RECAP ****
httpd : ok=12  changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
tomcat : ok=18  changed=5    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
[student@EPBYMINW0910 Day02]$
```

Picture 6.1 – Post_tasks debug info

- Specify tomcat version in playbook, inventory (group vars, host vars), extra vars – try different.



```
student@EPBYMINW0910:~/devosplab/Ansible/Day02
File Edit View Search Terminal Help
# Create user on All hosts
- hosts: all
  roles:
    - role: creating_user
      user_name: hleb

    # install net-tools to example
    pre_tasks:
      - name: install net-tools
        yum:
          name: net-tools
          state: present

# installing Tomcat + Java on Appserver host
- hosts: appservers
  roles:
    - role: tomcat
      user_name: hleb
      tomcat_version: tomcat-8
      tomcat_release: 8.5.42
      username_tomcat: tomcat
      usergroup_tomcat: tomcat

# installing HTTPD on Webserver host
- hosts: webservers
  roles:
    - role: httpd

- hosts: webservers:appservers
  post_tasks:
    - debug: msg="Works at the end"
-
"playbook.yml" [noeol] 31L, 610C
```

Picture 7.1 – Filed “user_name” is hleb

```
$ ansible-playbook -i inventory playbook.yml --extra-vars
"{"user_name": "devops"}" -u root -k -v
```

```
student@EPBYMINW0910:~/devopsplab/Ansible/Day02
student@EPBYMINW0910:~/devopsplab/Ansible/Day02 120x35
[adjust] "0", "OnFailureJobMode": "replace", "OnFailureJobs": "only", "NoPrivateDevices": "no", "PrivateNetwork": "no", "PrivateTap": "yes", "ProtectHome": "no", "ProtectSystem": "no", "RefuseManualStart": "no", "RefuseManualStop": "no", "RefuseReboot": "no", "RemainingExit": "no", "Requires": "basic,targetount", "RequiresMountFor": "/var/tmp", "Restart": "no", "RestartSec": "100ms", "Result": "success", "RootDirectoryStartOnly": "no", "RuntimeDirectoryMode": "9755", "SameProcessGroup": "no", "Secredito": "none", "SendSIGHUP": "no", "SendSIGKILL": "yes", "Slice": "system.slice", "StandardError": "inherit", "StandardInput": "null", "StandardOutput": "journal", "StartLimitAction": "none", "StartLimitBurst": "3", "StartLimitInterval": "10000000", "StartupBlockIOWeight": "18446744073709551615", "StartupPUShares": "18446744073709551615", "StatusErrno": "0", "StatusText": "Total requests: 2; Current requests/sec: 0; Current traffic: 0 B/sec; StopWhenUnneeded": "no", "SubState": "running", "SyslogLevelPrefix": "yes", "SyslogPriority": "30", "SystemCallErrorNumber": "0", "TTRRejet": "no", "TTRYHangup": "no", "TTRYTIDisallocate": "no", "TasksAccounting": "no", "TasksCurrent": "18446744073709551615", "TasksMax": "18446744073709551615", "TimeoutStartSec": "1min 30s", "TimeoutStopSec": "1min 30s", "TimersLackSec": "5000", "Transient": "no", "Type": "notify", "Umask": "0022", "UnfilePreset": "disabled", "UnfileStat": "enabled", "WantedBy": "multi-user.target", "Wants": "system.slice", "WatchdogTimestamp": "Mon 2019-07-15 14:30:15 UTC", "WatchdogTimestamponMonotonic": "4660561149", "WatchdogUserSec": "0"})

PLAY [webservers:appservers] ****

TASK [Gathering Facts] *****
ok: [httpd]
ok: [tomcat]

TASK [debug] *****
ok: [httpd] => {
  "msg": "Works at the end"
}
ok: [tomcat] => {
  "msg": "Works at the end"
}

PLAY RECAP *****
httpd : ok=12    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
tomcat: ok=18    changed=5    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[student@EPBYMINW0910 Day02]$ ansible-playbook -i inventory playbook.yml --extra-vars "(\\"user_name\\":\\"devops\\")" -u root -k -v
```

Picture 7.2 – Successful trying extra vars

```
student@EPBYMINW0910:~/devosplab/Ansible/Day02
student@EPBYMINW0910:~/devosplab/Ansible/Day02 120x35

PLAY [webservers] *****

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

TASK [httpd : httpd installation] *****
ok: [httpd] => {"changed": false, "msg": "", "rc": 0, "results": {"httpd-2.4-0-89.el7.centos.x86_64": "providing httpd is already installed"})

TASK [httpd : httpd proxy to tomcat] *****
ok: [httpd] => {"changed": false, "checksum": "Ce439f8ceee992dc34d5529f399cf2240189e7", "dest": "/etc/httpd/conf.d/tomcat.conf", "gid": 0, "group": "root", "mode": "644", "owner": "root", "path": "/etc/httpd/conf.d/tomcat.conf", "size": 130, "state": "file", "uid": 0}

TASK [httpd : httpd service enable] *****
ok: [httpd] => {"changed": false, "enabled": true, "name": "httpd", "state": "started", "status": {"ActiveEnterTimestamp": "Mon 2019-07-15 14:30:15 UTC", "ActiveEnterTimestampMonotonic": "4660956118", "ActiveExitTimestamp": "Mon 2019-07-15 14:30:13 UTC", "ActiveExitTimestampMonotonic": "4660957265", "ActiveState": "active", "After": "remote-fs.target", "System": "slice", "User": "nss-lookup.target", "Mount": "mount", "Network": "network.target", "AllowIsolate": "no", "AllowController": "0", "AssertResult": "yes", "AssertTimestamp": "Mon 2019-07-15 14:30:15 UTC", "AssertTimestampMonotonic": "4660957289", "Before": "multi-user.target", "Start": "user", "BlockIOAccounting": "no", "BlockIOWeight": "100000", "CPUAccounting": "no", "CPUQuotaPerUserSec": "infinity", "CPUQuotaSchedulingPolicy": "0", "CPUSchedulingPriority": "404467", "CPUSchedulingPriorityMonotonic": "407370955165", "CPUWeight": "100000"}, "Timestamp": "2019-07-15T14:30:15.000000000Z", "Type": "service"}}
```

Picture 7.3 – User not changed

This is useful for, among other things, setting the hosts group or the user for the playbook. Difference only in the precedence.

Here is the order of precedence from least to greatest (the last listed variables winning prioritization):

1. command line values (eg “-u user”)
 2. role defaults
 3. inventory file or script group vars
 4. inventory group_vars/all
 5. playbook group_vars/all
 6. inventory group_vars/*
 7. playbook group_vars/*
 8. inventory file or script host vars
 9. inventory host_vars/*
 10. playbook host_vars/*
 11. host facts / cached set_facts
 12. play vars
 13. play vars_prompt
 14. play vars_files

15. role vars (defined in role/vars/main.yml)
16. block vars (only for tasks in block)
17. task vars (only for the task)
18. include_vars
19. set_facts / registered vars
20. role (and include_role) params
21. include params
22. extra vars (always win precedence)