

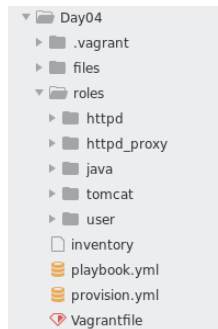
Lab Work Task. Day 4.

Making playbooks and output better.

Task

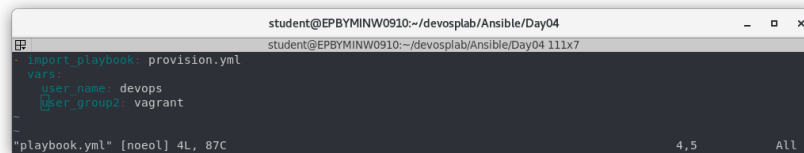
A) On Control Machine:

Create folder ~/ansible/day4. All working files should be placed there (Vagrantfile, playbooks, roles, callback plugins, etc)

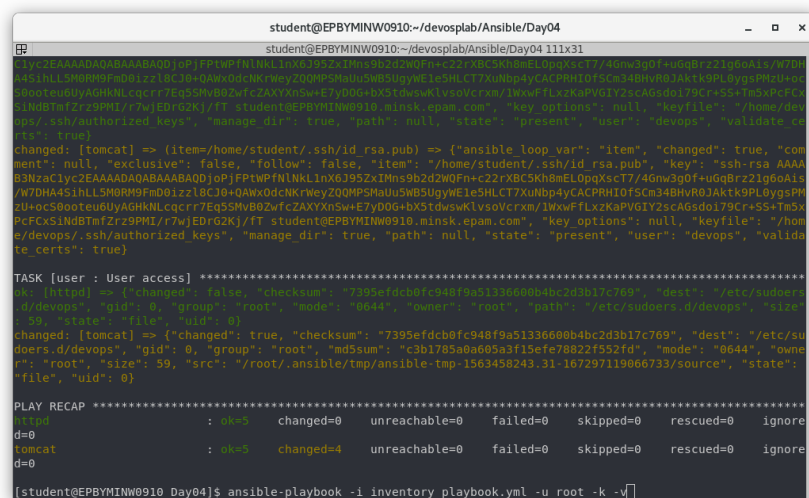


Picture 1

B) Refactor playbook from previous homeworks to use import_playbook statements: split playbook to plays, place each play into separate file, load each with import statement.

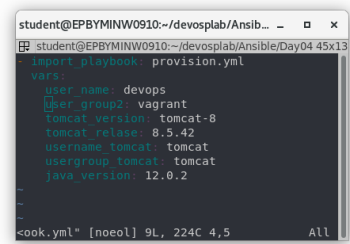


Picture 2.1 – Import playbook with variables



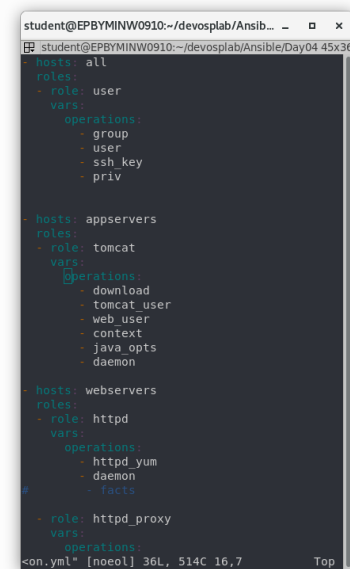
Picture 2.2 - Results

C) Refactor roles from previous homeworks to use `import_tasks` statements with necessary when clauses for making code cleaner and better understandable.



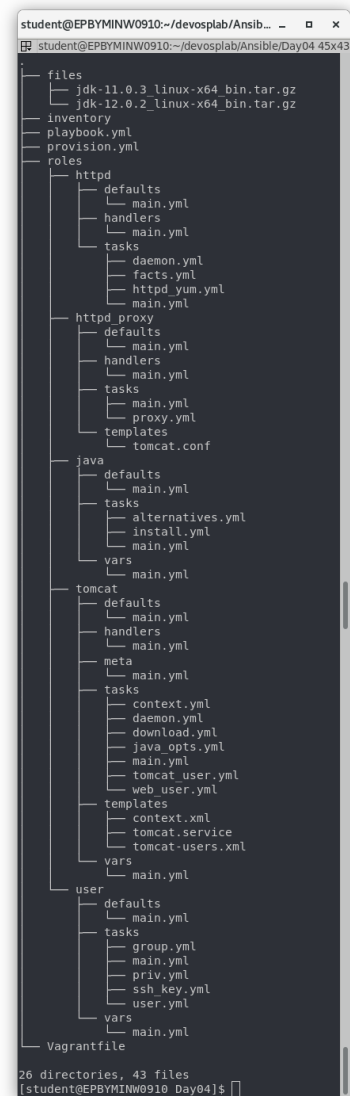
```
student@EPBYMINW0910:~/devosplab/Ansib...  
student@EPBYMINW0910:~/devosplab/Ansible/Day04 45x13  
import_playbook: provision.yml  
vars:  
  user_name: devops  
  user_group2: vagrant  
  tomcat_version: tomcat-8  
  tomcat_release: 8.5.42  
  username_tomcat: tomcat  
  usergroup_tomcat: tomcat  
  java_version: 12.0.2  
cook.yml" [noeol] 9L, 224C 4,5 All
```

Picture 2.1 – playbook.yml

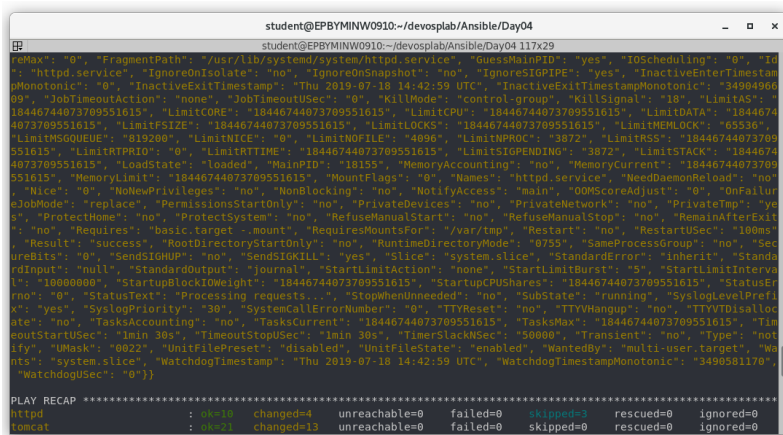


```
student@EPBYMINW0910:~/devosplab/Ansib...  
student@EPBYMINW0910:~/devosplab/Ansible/Day04 45x36  
- hosts: all  
  roles:  
  - role: user  
    vars:  
      operations:  
        - group  
        - user  
        - ssh key  
        - priv  
  
- hosts: appservers  
  roles:  
  - role: tomcat  
    vars:  
      operations:  
        - download  
        - tomcat_user  
        - web_user  
        - context  
        - java_opts  
        - daemon  
  
- hosts: webservers  
  roles:  
  - role: httpd  
    vars:  
      operations:  
        - httpd_yum  
        - daemon  
#  
  - role: httpd_proxy  
    vars:  
      operations:  
        - facts  
con.yml" [noeol] 36L, 514C 16,7 Top
```

Picture 2.2 – provision.yml



Picture 2.2 – Project tree view



Picture 2.3 – Results

D) Equip tasks with tags (webserver, appserver, always, never (v2.5), sanity, etc). Run playbook with different tags.

```
playbook: playbook.yml

play #1 (all): all    TAGS: [all,user,always]
TASK TAGS: [all, always, user]

play #2 (all): all    TAGS: [all,never,java]
TASK TAGS: [all, java, never]

play #3 (appservers): appservers    TAGS: [all,tomcat,always]
TASK TAGS: [all, always, tomcat]

play #4 (webservers): webservers    TAGS: [all]
TASK TAGS: [all, always, httpd, proxy]
[student@EPBYMINW0910 Day04]$
```

Picture 3.1 – ansible-playbook playbook.yml --list-tags

```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 121x43
[student@EPBYMINW0910 Day04]$ ansible-playbook -i inventory provision.yml -u root -k --tags=user
SSH password:

PLAY [all] *****

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

TASK [user : User group create] *****
ok: [tomcat]
ok: [httpd]

TASK [user : User create] *****
ok: [tomcat] => (item={u'home': True, u'name': u'devops', u'groups': u'devops, vagrant', u'uid': 1021})
ok: [httpd] => (item={u'home': True, u'name': u'devops', u'groups': u'devops, vagrant', u'uid': 1021})

TASK [user : User key] *****
ok: [httpd] => (item=/home/student/.ssh/id_rsa.pub)
ok: [tomcat] => (item=/home/student/.ssh/id_rsa.pub)

TASK [user : User access] *****
ok: [tomcat]
ok: [httpd]

PLAY [all] *****

PLAY [appservers] *****

PLAY [webservers] *****

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

PLAY RECAP *****
httpd      : ok=6    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

[student@EPBYMINW0910 Day04]$
```

Picture 3.2 – Run with tag user

```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 121x43
TASK [java : Jar alternatives] *****
changed: [tomcat]

TASK [java : Javac alternatives] *****
changed: [tomcat]

TASK [tomcat : tomcat download] *****
ok: [tomcat]

TASK [tomcat : tomcat unarchive] *****
changed: [tomcat]

TASK [tomcat : tomcat shell operation] *****
changed: [tomcat]

TASK [tomcat : tomcat web-user settings] *****
changed: [tomcat]

TASK [tomcat : tomcat context.xml setup changes] *****
changed: [tomcat]

TASK [tomcat : tomcat JAVA_OPTS] *****
changed: [tomcat]

TASK [tomcat : tomcat service create] *****
ok: [tomcat]

TASK [tomcat : tomcat service enable] *****
ok: [tomcat]

RUNNING HANDLER [tomcat : restart apache tomcat] *****
changed: [tomcat]

PLAY [webservers] *****

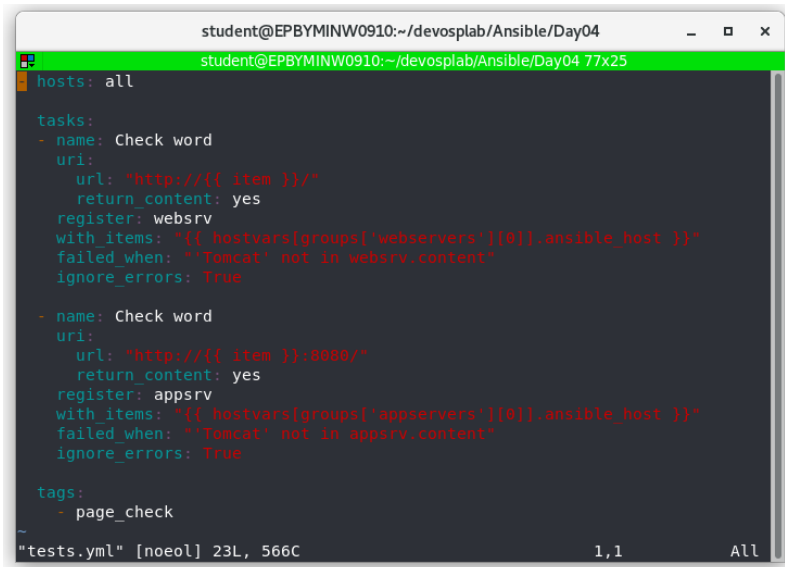
TASK [Gathering Facts] *****
ok: [httpd]

PLAY RECAP *****
httpd      : ok=6    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
tomcat     : ok=21   changed=9    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[student@EPBYMINW0910 Day04]$ ansible-playbook -i inventory provision.yml -u root -k --tags=user,tomcat
```

Picture 3.2 – Run with tags user and tomcat

E) Refactor java and httpd roles from previous homeworks. Move out sanity checks to separate role. Simplify role usage (httpd tests, java tests, tomcat tests, etc). Pass necessary parameters. Call role with tag sanity. Test behavior.



```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 77x25
hosts: all

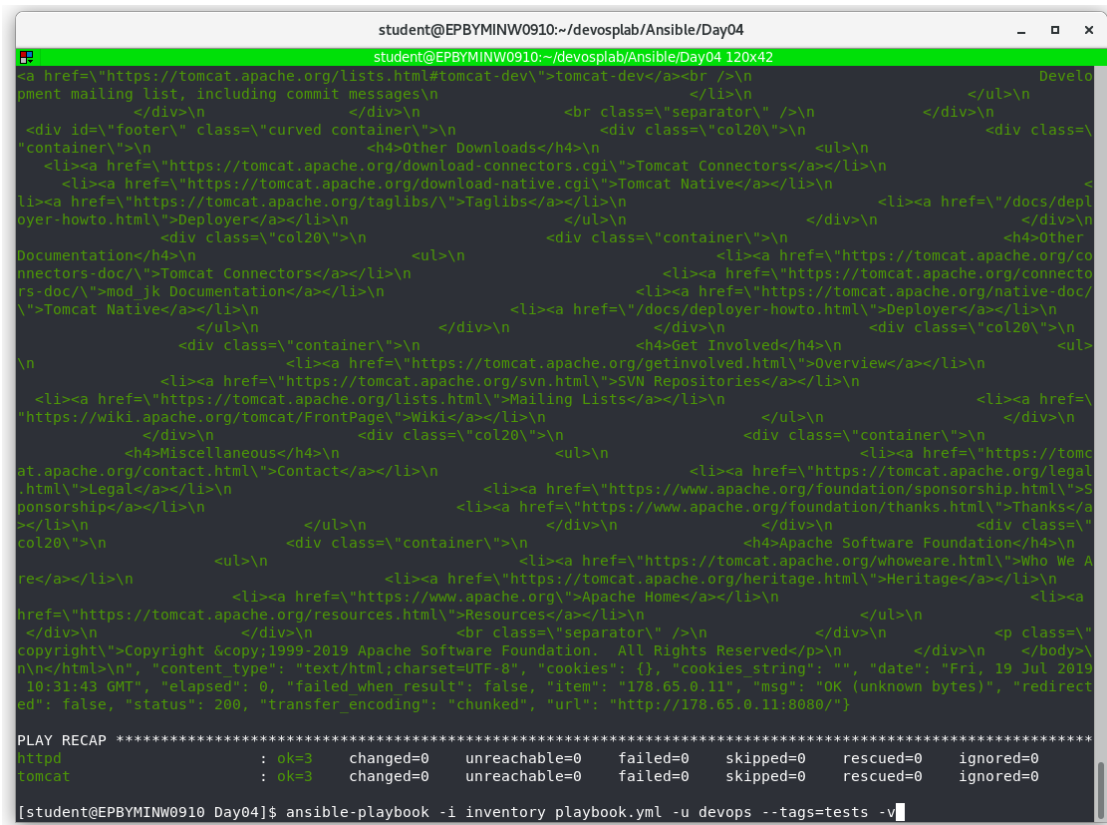
tasks:
- name: Check word
  uri:
    url: "http://{{ item }}"
    return_content: yes
  register: webserv
  with_items: "{{ hostvars[groups['webservers'][0]].ansible_host }}"
  failed_when: "'Tomcat' not in webserv.content"
  ignore_errors: True

- name: Check word
  uri:
    url: "http://{{ item }}:8080/"
    return_content: yes
  register: appsrv
  with_items: "{{ hostvars[groups['appservers'][0]].ansible_host }}"
  failed_when: "'Tomcat' not in appsrv.content"
  ignore_errors: True

tags:
- page_check

~
"tests.yml" [noeol] 23L, 566C
1,1 All
```

Picture 4.1 – Tomcat page test role



```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 120x42
<a href="https://tomcat.apache.org/lists.html#tomcat-dev">tomcat-dev</a><br /></li></ul></div>
</div></div>
<div id="footer" class="curved container">
  <div class="col20">
    <h4>Other Downloads</h4>
    <ul>
      <li><a href="https://tomcat.apache.org/download-connectors.cgi">Tomcat Connectors</a></li>
      <li><a href="https://tomcat.apache.org/download-native.cgi">Tomcat Native</a></li>
      <li><a href="https://tomcat.apache.org/taglibs/">Taglibs</a></li>
      <li><a href="/docs/deployer-howto.html">Deployer</a></li>
    </ul>
  </div>
  <div class="col20">
    <div class="container">
      <h4>Other
        <div class="col20">
          <li><a href="https://tomcat.apache.org/getinvolved.html">Overview</a></li>
          <li><a href="https://tomcat.apache.org/svn.html">SVN Repositories</a></li>
          <li><a href="https://tomcat.apache.org/lists.html">Mailing Lists</a></li>
          <li><a href="https://wiki.apache.org/tomcat/FrontPage">Wiki</a></li>
        </div>
      <h4>Miscellaneous</h4>
      <div class="col20">
        <li><a href="https://tomcat.apache.org/contact.html">Contact</a></li>
        <li><a href="https://www.apache.org/foundation/sponsorship.html">Sponsorship</a></li>
        <li><a href="https://www.apache.org/foundation/thanks.html">Thanks</a></li>
      </div>
    </div>
  </div>
  <div class="col20">
    <h4>Apache Software Foundation</h4>
    <ul>
      <li><a href="https://tomcat.apache.org/whoweare.html">Who We Are</a></li>
      <li><a href="https://www.apache.org">Apache Home</a></li>
      <li><a href="https://tomcat.apache.org/resources.html">Resources</a></li>
    </ul>
  </div>
</div>
<p>Copyright © 1999-2019 Apache Software Foundation. All Rights Reserved</p>
</div>
</body>
</html>
"content type": "text/html; charset=UTF-8", "cookies": {}, "cookies string": "", "date": "Fri, 19 Jul 2019 10:31:43 GMT", "elapsed": 0, "failed when result": false, "item": "178.65.0.11", "msg": "OK (unknown bytes)", "redirected": false, "status": 200, "transfer_encoding": "chunked", "url": "http://178.65.0.11:8080/"

PLAY RECAP *****
httpd      : ok=3    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
tomcat     : ok=3    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[student@EPBYMINW0910 Day04]$ ansible-playbook -i inventory playbook.yml -u devops --tags=tests -v
```

Picture 4.2 – Tomcat page test results


```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 117x25
[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost does not match 'all'

[WARNING]: Could not match supplied host pattern, ignoring: appservers

[WARNING]: Could not match supplied host pattern, ignoring: webservers

playbook: playbook.yml

play #1 (all): all TAGS: [all,user,allways]
TASK TAGS: [all, allways, user]

play #2 (all): all TAGS: [all,never,java]
TASK TAGS: [all, java, never]

play #3 (appservers): appservers TAGS: [all,tomcat,allways]
TASK TAGS: [all, allways, tomcat]

play #4 (webservers): webservers TAGS: [all]
TASK TAGS: [all, allways, httpd, proxy]

play #5 (all): all TAGS: [all]
TASK TAGS: [all, test_java, test_tomcat, tests]
[student@EPBYMINW0910 Day04]$ ansible-playbook playbook.yml --list-tags
```

Picture 4.5 – Tags list

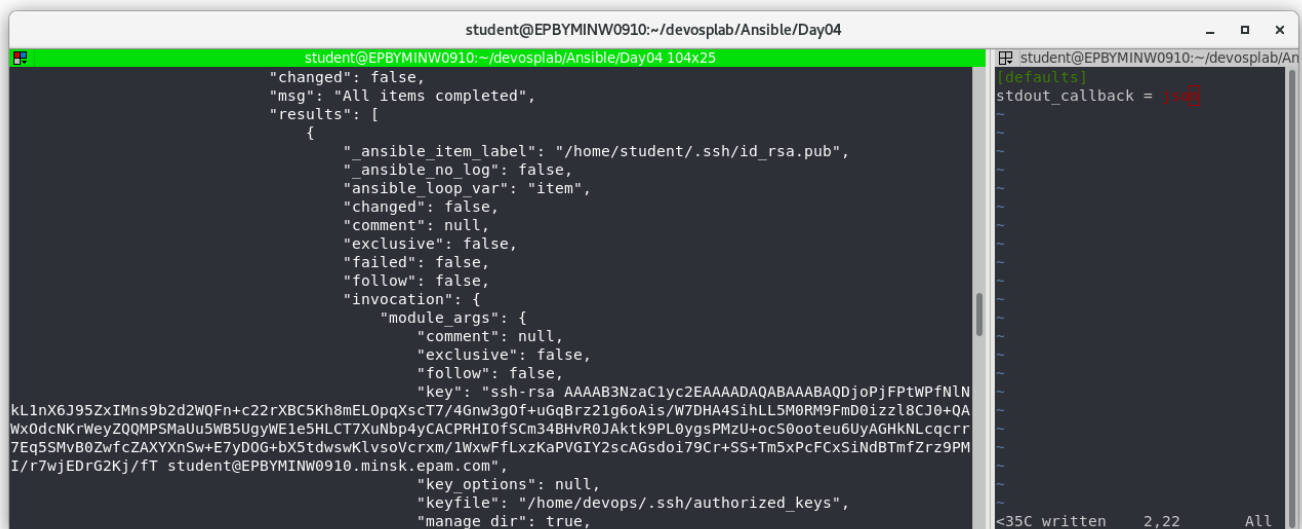
F) Use my custom call back plugin with your playbooks. Make necessary changes (if needed). Provide detailed information how you configured ansible to use this plugin.

```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 104x25
{"start": "2019-07-19 13:10:03.688445"}
}
STDOUT:
-Xms128m -Xmx512m -server

TASK [tomcat : tomcat service create] *****
ok: [tomcat] => {
  "changed": false,
  "checksum": "18d0c66d2041df8462646c0cf05a53bc602601f3",
  "dest": "/etc/systemd/system/tomcat.service",
  "gid": 0,
  "group": "root",
  "mode": "0644",
  "owner": "root",
  "path": "/etc/systemd/system/tomcat.service",
  "size": 737,
  "state": "file",
  "uid": 0
}

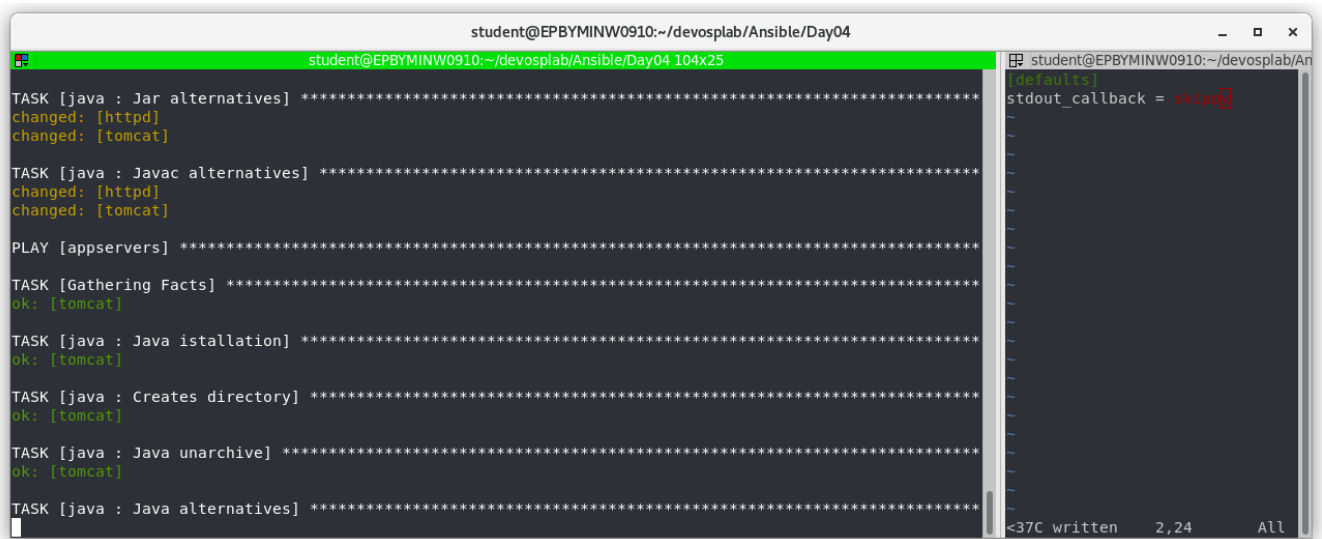
TASK [tomcat : tomcat service enable] *****
<fg" 2L, 35C 1,1 All
```

Picture 5.1 – Call back plugin “Debug”



```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 104x25
"changed": false,
"msg": "All items completed",
"results": [
  {
    "_ansible_item_label": "/home/student/.ssh/id_rsa.pub",
    "_ansible_no_log": false,
    "ansible_loop_var": "item",
    "changed": false,
    "comment": null,
    "exclusive": false,
    "failed": false,
    "follow": false,
    "invocation": {
      "module_args": {
        "comment": null,
        "exclusive": false,
        "follow": false,
        "key": "ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQDJoPjFPtWPfNlN
kl1nX6J95ZxIMns9b2d2WQFn+c22rXBC5Kh8mEL0pqXscT7/4Gnw3g0f+uGqBrz21g6oAis/W7DHA4SihLL5M0RM9FmD0izzl8CJ0+QA
Wx0dcNKrWeyZQQMP5MaUu5WB5UgyWE1e5HLC7XuNbp4yCACPRH10f5Cm34BHvR0JAkt9PL0ygsPMzU+ocS0ooteu6UyAGHkNLCqcr
7Eq5SMvB0ZwfcZAXYXnSw+E7yD0G+bX5tdwsWklvsoVcrxm/1WxwFfLxKaPVGIY2scAGsdoi79Cr+SS+Tm5xPcFCxSiNdBTmfZrz9PM
I/r7wjEDrG2Kj/ft student@EPBYMINW0910.minsk.epam.com",
        "key_options": null,
        "keyfile": "/home/devops/.ssh/authorized_keys",
        "manage_dir": true,
      }
    }
  }
]
<35C written 2,22 All
```

Picture 5.2 – Call back plugin “Json”



```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 104x25
TASK [java : Jar alternatives] *****
changed: [httpd]
changed: [tomcat]

TASK [java : Javac alternatives] *****
changed: [httpd]
changed: [tomcat]

PLAY [appservers] *****

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

TASK [java : Java installation] *****
ok: [tomcat]

TASK [java : Creates directory] *****
ok: [tomcat]

TASK [java : Java unarchive] *****
ok: [tomcat]

TASK [java : Java alternatives] *****
ok: [tomcat]

<37C written 2,24 All
```

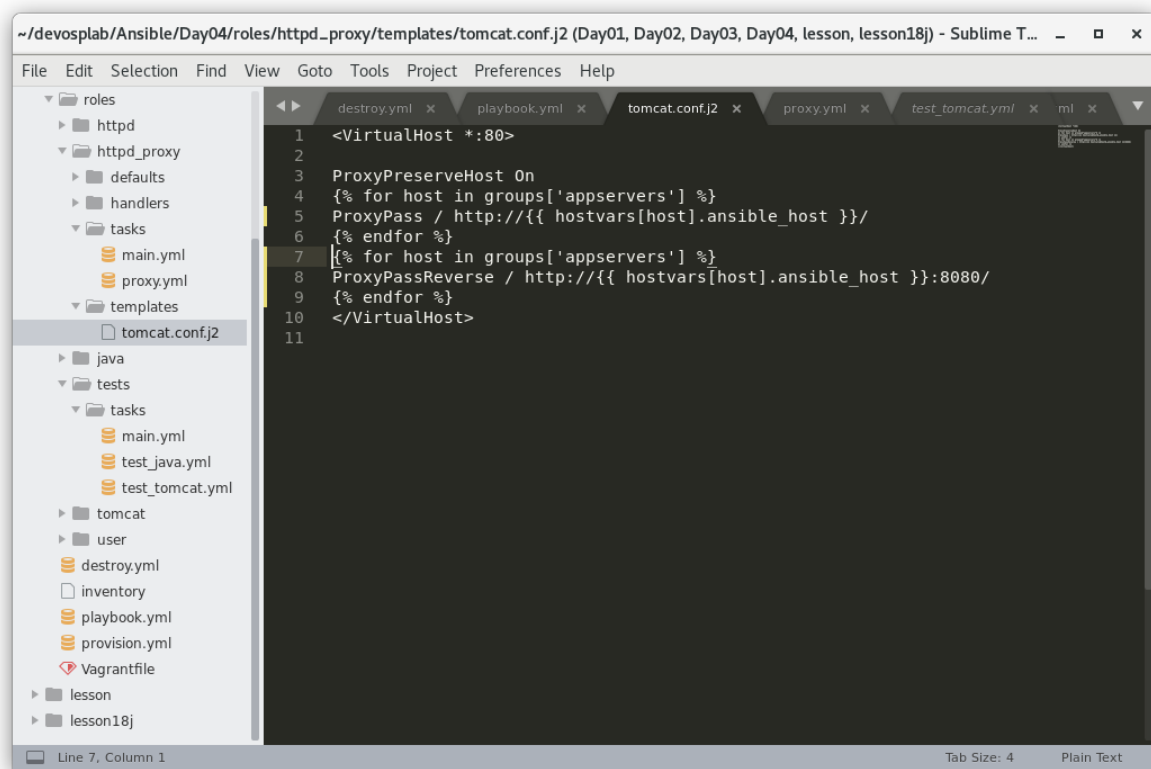
Picture 5.3 – Call back plugin “Skippy”

I am create ansible config file “/etc/ansible/ansible.cfg” and add into [deafault] stdout_callback with needed configuration.

Also we can use export variable:

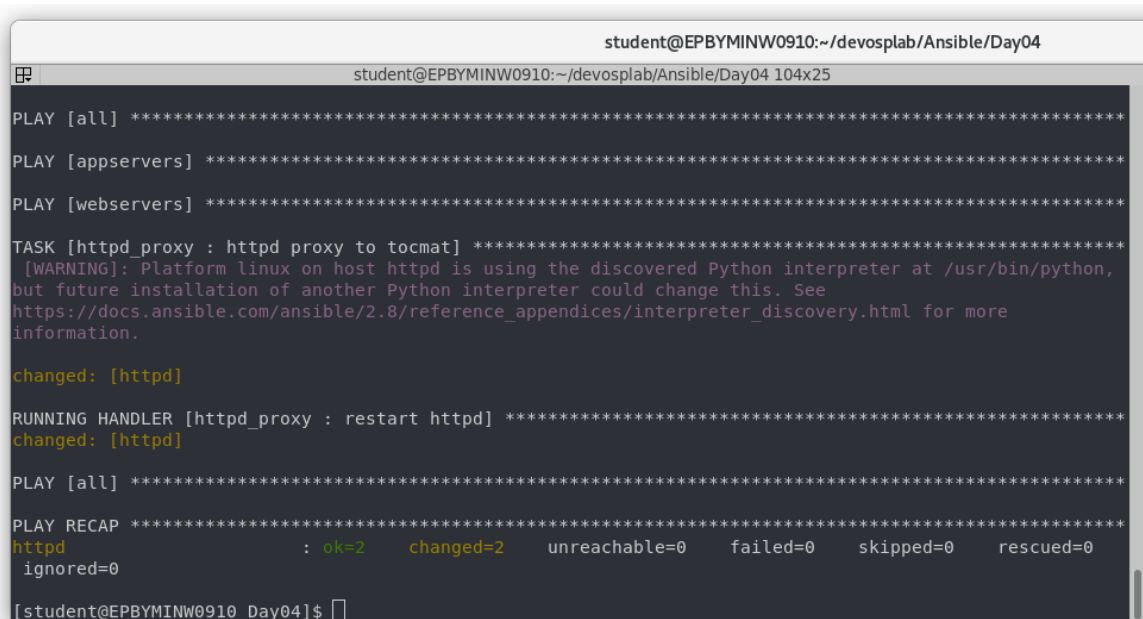
```
$ export ANSIBLE_STDOUT_CALLBACK=debug
```

G) Create template file to produce httpd VirtualHosts configuration, develop simple playbook for testing needs, define a list of domains, specify different parameters for every domain.



```
1 <VirtualHost *:80>
2
3 ProxyPreserveHost On
4 {% for host in groups['appservers'] %}
5 ProxyPass / http://{{ hostvars[host].ansible_host }}/
6 {% endfor %}
7 {% for host in groups['appservers'] %}
8 ProxyPassReverse / http://{{ hostvars[host].ansible_host }}:8080/
9 {% endfor %}
10 </VirtualHost>
11
```

Picture 6.1 – Template httpd vhosts



```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 104x25

PLAY [all] *****

PLAY [appservers] *****

PLAY [webserver] *****

TASK [httpd_proxy : httpd proxy to tocmat] *****
[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.

changed: [httpd]

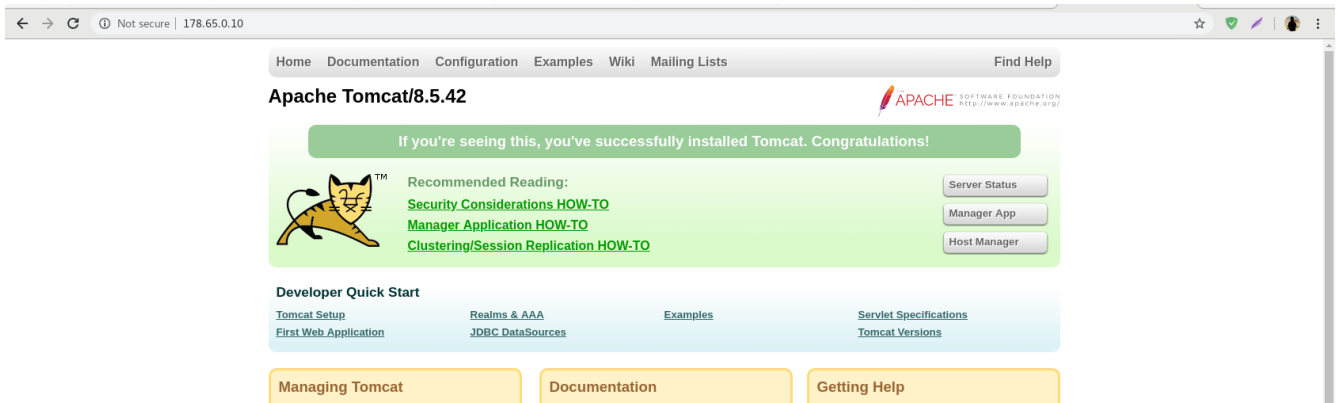
RUNNING HANDLER [httpd_proxy : restart httpd] *****
changed: [httpd]

PLAY [all] *****

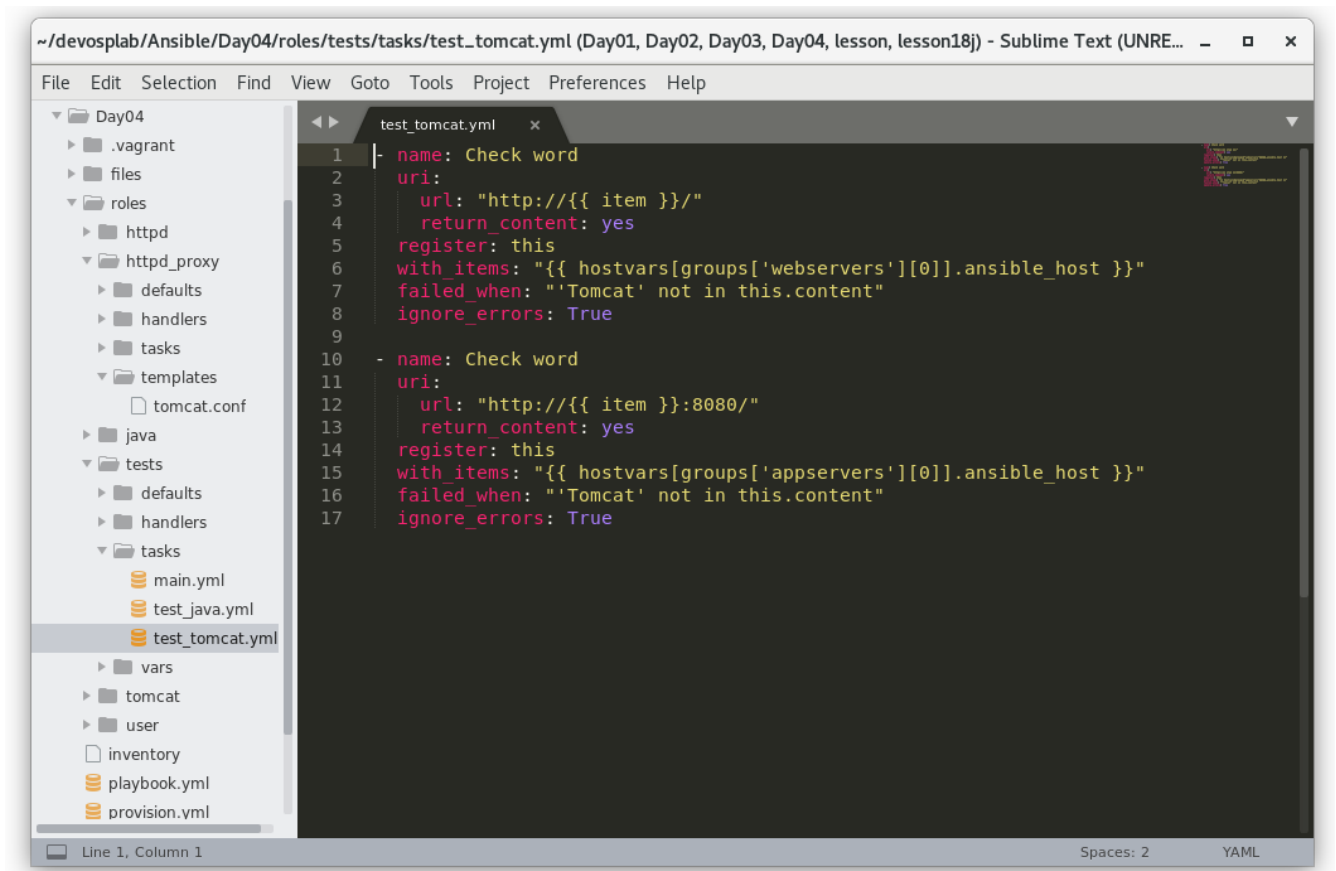
PLAY RECAP *****
httpd : ok=2 changed=2 unreachable=0 failed=0 skipped=0 rescued=0
ignored=0

[student@EPBYMINW0910 Day04]$
```

Picture 6.2 – ansible-playbook -i inventory playbook.yml -u root -k --tags=proxy



Picture 6.3 – Check results



Picture 6.4 – Playbook for testing needs

H) Create Ansible Configuration file. Specify following settings (at least):

- Default inventory file to be used
- Callback plugins location and configuration
- Roles location
- Default remote user (vagrant)
- Default private ssh key
- Ansible managed comments string
- Enable displaying args to stdout
- Disable retry files creation
- Explore squash configuration
- Enable pipelining. Describe changes how you see them.

```
student@EPBYMINW0910:~/devoslab/Ansible/Day04
student@EPBYMINW0910:~/devoslab/Ansible/Day04 75x25

[defaults]
stdout_callback = default
inventory = /home/student/devoslab/Ansible/Day04/inventory
callback_plugins = /usr/share/ansible/plugins/callback
roles_path = /home/student/devoslab/Ansible/Day04/roles
remote_user = vagrant
private_key_file = /home/student/.ssh/key.pem
ansible_managed =
+++++++
Hleb Kanonik
By: {uid} on {host}
Using template: {file}
+++++++
display_args_to_stdout = False
retry_files_enabled = False
squash_actions = yum,apt,pacman
pipelining = False
~
~
~
~
~
"/etc/ansible/ansible.cfg" 17L, 550C      17,1      All
```

Picture 7.1 – Configuration file

```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 127x25
SSH password:
PLAY [all] *****
PLAY [all] *****
PLAY [appservers] *****
PLAY [webservers] *****
TASK [httpd_proxy : httpd proxy to tomcat] *****
[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.
ok: [httpd] => {"ansible_facts": {"discovered_interpreter_python": "/usr/bin/python"}, "changed": false, "checksum": "3f9c3b02c
36d5f35a793e2d7c4c4e1788ba723e4", "dest": "/etc/httpd/conf.d/tomcat.conf.j2", "gid": 0, "group": "root", "mode": "0644", "owner":
"root", "path": "/etc/httpd/conf.d/tomcat.conf.j2", "size": 132, "state": "file", "uid": 0}
PLAY [all] *****
PLAY RECAP *****
httpd : ok=1 changed=0 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

[student@EPBYMINW0910 Day04]$ ansible-playbook -i inventory playbook.yml -u root -k --tags=proxy -v
```

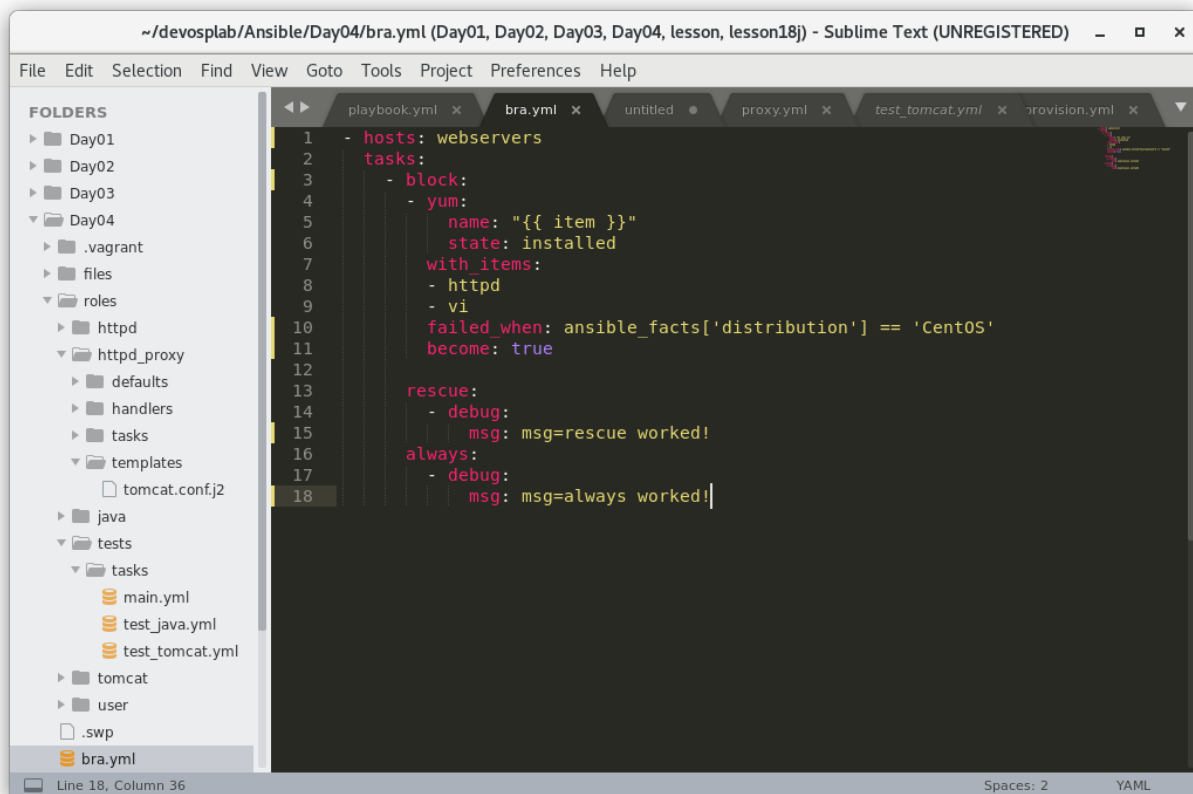
Picture 7.2 – Provision after changing ansible.conf

I) Develop simple playbook which uses Block/Rescue/Always flow. Describe behavior how you see this works.

The condition inside the “block” will be fulfilled when the condition in “when” is met. After an error appears in “block”, the execution goes to “rescue”. “Always” is always performed.

Using “block” you can intercept errors, for example:

*Условие внутри “block” будет выполнено, когда будет соблюдено условие в “when”. После появления ошибки в “block” выполнение переходит в “rescue”. “Always” выполняется всегда.
С помощью “block” можно перехватывать ошибки, например:*



Picture 8.1

```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 127x25
ok: [httpd]

TASK [yum] *****
[DEPRECATION WARNING]: Invoking "yum" only once while using a loop via squash_actions is deprecated. Instead of using a loop
to supply multiple items and specifying 'name: "{{ item }}"', please use 'name: ['httpd', 'vi']' and remove the loop. This
feature will be removed in version 2.11. Deprecation warnings can be disabled by setting deprecation_warnings=False in
ansible.cfg.
failed: [httpd] (item=[u'httpd', u'vi']) => ("ansible_loop_var": "item", "changed": false, "failed_when_result": true, "item":
["httpd", "vi"], "msg": "", "rc": 0, "results": [{"httpd-2.4.6-89.el7.centos.x86_64 providing httpd is already installed"}, {"2:vi
n-minimal-7.4.160-5.el7.x86_64 providing vi is already installed"}])

TASK [debug] *****
ok: [httpd] => {
  "msg": "msg=rescue worked!"
}

TASK [debug] *****
ok: [httpd] => {
  "msg": "msg=always worked!"
}

PLAY RECAP *****
httpd      : ok=3    changed=0    unreachable=0    failed=0    skipped=0    rescued=1    ignored=0

[student@EPBYMINW0910 Day04]$
```

Picture 8.2 – rescue & always worked

Check results without error:

```
~/devosplab/Ansible/Day04/bra.yml (Day01, Day02, Day03, Day04, lesson, lesson18) - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help

FOLDERS
├─ Day01
├─ Day02
├─ Day03
├─ Day04
│   ├── .vagrant
│   ├── files
│   ├── roles
│   ├── .swp
│   └─ bra.yml
├─ inventory
├─ playbook.yml
├─ provision.yml
└─ Vagrantfile

├─ lesson
└─ lesson18j

1 - hosts: webserver
2 tasks:
3   - block:
4     - yum:
5       name: vim
6       when: ansible_facts['distribution'] == 'CentOS'
7       become: true
8
9     rescue:
10      - debug:
11        msg: msg=rescue worked!
12
13    always:
14      - debug:
15        msg: msg=always worked!
```

Picture 8.3

```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 127x25

PLAY [appservers] *****
PLAY [web servers] *****
PLAY [all] *****
PLAY [web servers] *****
TASK [Gathering Facts] *****
ok: [httpd]

TASK [yum] *****
ok: [httpd] => {"changed": false, "msg": "", "rc": 0, "results": ["2:vim-enhanced-7.4.160-6.el7_6.x86_64 providing vim is already installed"]}

TASK [debug] *****
ok: [httpd] => {
  "msg": "msg=always worked!"
}

PLAY RECAP *****
httpd                : ok=3    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[student@EPBYMINW0910 Day04]$
```

Picture 8.3 – Only always worked

J) Update Custom Module from previous homework to have Documentation built-in. Check documentation availability with ansible-doc command.

```
student@EPBYMINW0910:~/devosplab/Ansible/Day04
student@EPBYMINW0910:~/devosplab/Ansible/Day04 92x25

[student@EPBYMINW0910 Day04]$ ansible-doc hk_status.py
> HKANONIK_STATUS_CHECK (/home/student/.ansible/plugins/modules/hk_status.py)

  • Process is running as expected (by name, under user)• Port is handled
  by proper process, in listening mode• Web content of given url contains
  given regexp string• Web server information (curl -IL url) contains given
  regexp string

  * This module is maintained by The Ansible Community
  AUTHOR: Hleb Kanonik
  METADATA:
    status:
      - preview
    supported_by: community

  EXAMPLES:
  - name: using module
    hkanonik_status_check:
      name: start
      state: present

[student@EPBYMINW0910 Day04]$
```

```
student@EPBYMINW0910:~/devosplab/Ansible/Day04 92x22
/usr/bin/python

DOCUMENTATION = '''
---
module: hkanonik_status_check
short description: hello
description: • Process is running as expected (by name, under user)• Port is handled by proper
process, in listening mode• Web content of given url contains given regexp string• Web server
information (curl -IL url) contains given regexp string
author: Hleb Kanonik
'''

EXAMPLES = '''
- name: using module
  hkanonik_status_check:
    name: start
    state: present
'''

from ansible.module_utils.basic import *
import requests

1,1 Top
```

Picture 9