Other options for ansible-playbook

The ansible-playbook command also allows for some other common options:

--inventory=PATH (-i PATH): Define a custom inventory file (default is the default Ansible inventory file, usually located at /etc/ansible/hosts).

--verbose (-v): Verbose mode (show all output, including output from successful options). You can pass in -vvvv to give every minute detail.

--extra-vars=VARS (-e VARS): Define variables to be used in the playbook, in "key=value,key=value" format.

--forks=NUM (-f NUM): Number for forks (integer). Set this to a number higher than 5 to increase the number of servers on which Ansible will run tasks concurrently.

--connection=TYPE (-c TYPE): The type of connection which will be used (this defaults to ssh; you might sometimes want to use local to run a playbook on your local machine, or on a remote server via cron).

ansible-playbook 4.yml --connection=local

--check: Run the playbook in Check Mode ('Dry Run'); all tasks defined in the playbook will be checked against all hosts, but none will actually be run.

Handler Tasks

- ▶ Handlers are special tasks that run at the end of a play if notified by another task when a change occurs.

- ▶ Example :

   "If a configuration file gets changed notify a service restart task that needs to run."

Example Handler Task in a Play

tasks:

- name: httpd package is present

  yum:

    name: httpd

    state: latest

  notify: restart httpd

- name: latest index.html file is present

  copy:

    src: files/index.html

    dest: /var/www/html/

handlers:

- name: restart httpd

  service:

    name: httpd

    state: restarted

#To limit the host on playbooks
ansible-playbook 5.yml --limit devserver

#To list host details on the playbooks
ansible-playbook 4.yml --list-hosts

#To check playbook syntax
ansible-playbook 9.yml --syntax-check

7.yml

```
---

- name: Playbook with multiple items
  hosts: all

  tasks:

  - name: 'Check httpd package is present'
    yum:
      name=httpd
      state=present
    notify: restart httpd service

  handlers:
  - name : restart httpd service
    service:
      name=httpd
      state=restarted
```

```
[root@ip-172-31-29-57 DevOps]# ansible-playbook 6.yml

PLAY [Playbook with multiple items] ****************************************

TASK [Gathering Facts] ****************************************************
ok: [13.127.244.80]

TASK [Check httpd package is present] *************************************
changed: [13.127.244.80]

RUNNING HANDLER [restart httpd service] **********************************
changed: [13.127.244.80]

PLAY RECAP **************************************************************
13.127.244.80              : ok=3    changed=2    unreachable=0    failed=0
```

8.yml

```yaml
---
 - name: Playbook with multiple items
   hosts: dev


   tasks:
   - name: 'Create a configuration file'
     file:
       dest=/tmp/test.txt
       state=touch
       mode=644
       owner=root
       group=root

    notify: Add content to config file


   handlers:
    - name : Add content to config file
      copy:
       dest=/tmp/test.txt
       content="This is a sample configuration file created using Ansible \n Please delete the file unless it is required."
```

```
[root@ip-172-31-29-57 DevOps]# ansible-playbook 7.yml

PLAY [Playbook with multiple items] ******************************************

TASK [Gathering Facts] ******************************************************
ok: [13.127.244.80]

TASK [Create a configuration file] ******************************************
changed: [13.127.244.80]

RUNNING HANDLER [Add content to config file] ********************************
changed: [13.127.244.80]

PLAY RECAP ******************************************************************
13.127.244.80              : ok=3    changed=2    unreachable=0    failed=0
```

9.yml – handler with listener

```yaml
---
- name: variable example
  hosts: all
  vars:
    pkg: httpd

  tasks:
  - name: install httpd package
    yum:
      name={{ pkg }}
      state=present
    notify: start service

  handlers:
   - name: start httpd service
     service:
       name=httpd  state=started
     listen: start service

   - name: restart samba service
     service:
       name=smb  state=restarted
     listen: start service
```

```
[root@ip-172-31-29-57 DevOps]# ansible-playbook 8.yml

PLAY [variable example] *************************************************

TASK [Gathering Facts] *************************************************
ok: [13.127.244.80]

TASK [install httpd package] *************************************************
changed: [13.127.244.80]

RUNNING HANDLER [start httpd service] *************************************************
changed: [13.127.244.80]

RUNNING HANDLER [restart samba service] *************************************************
changed: [13.127.244.80]

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

Variables

▶ Ansible can work with metadata from various sources and manage their context in the form of variables.

❖ Command line parameters

❖ Plays and tasks

❖ Files

❖ Inventory

❖ Discovered facts

❖ Roles

To get the ansible logs, check **log_path** in **ansible config file**

10.yml

```
---
- name: variable example
  hosts: all
  tasks:
  - name: install package
    yum:
      name={{ pkg1 }}
      state=latest
  - yum:
      name={{ pkg2  }}
      state=present
```

```
[root@ip-172-31-29-57 Ansible]# ansible-playbook 10.yml --extra-vars "pkg1=httpd pkg2=samba"

PLAY [variable example] *************************************************************

TASK [Gathering Facts] *************************************************************
ok: [13.127.244.80]

TASK [install package] *************************************************************
changed: [13.127.244.80]

TASK [yum] *************************************************************
changed: [13.127.244.80]

PLAY RECAP *************************************************************
13.127.244.80                : ok=3    changed=2    unreachable=0    failed=0
```

ansible-playbook 10.yml --extra-vars "pkg1=httpd pkg2=samba"

11.yml - Variables

- name: variable example

  hosts: all

  vars:

    pkg: mysql

  tasks:

  - name: install package

    yum:

      name={{ pkg }}

      state=latest

```
[root@ip-172-31-29-57 DevOps]# ansible-playbook 10.yml -vv
ansible-playbook 2.5.3
  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 = /bin/ansible-playbook
  python version = 2.7.5 (default, Feb 20 2018, 09:19:12) [GCC 4.8.5 20150623 (Red Hat 4.8.5-28)]
Using /etc/ansible/ansible.cfg as config file

PLAYBOOK: 10.yml ******************************************************************************
1 plays in 10.yml

PLAY [variable example] **********************************************************************

TASK [Gathering Facts] **********************************************************************
task path: /tmp/DevOps/10.yml:2
ok: [13.127.244.80]
META: ran handlers

TASK [install package] **********************************************************************
task path: /tmp/DevOps/10.yml:8
changed: [13.127.244.80] => {"changed": true, "msg": "", "rc": 0, "results": ["Loaded plugins: amazon-id, rhui-lb, search-disabled-repos\nResolving Dependencies\n--> Ru
nning transaction check\n---> Package mariadb.x86_64 1:5.5.56-2.el7 will be installed\n--> Finished Dependency Resolution\n\nDependencies Resolved\n\n==================
==================================================\n Package    Arch      Version          Repository                   Size\n=====================
==================================================\nInstalling:\n mariadb    x86_64   1:5.5.56-2.el7     rhui-REGION-rhel-server-releases   9.1 M\n\nTransaction S
ummary\n========================================================\nInstall  1 Package\n\nTotal download size: 9.1 M\nInstalled size: 49 M\nDownlo
ading packages:\nRunning transaction check\nRunning transaction test\nTransaction test succeeded\nRunning transaction\n  Installing : 1:mariadb-5.5.56-2.el7.x86_64
                    1/1 \n  Verifying  : 1:mariadb-5.5.56-2.el7.x86_64                         1/1 \n\nInstalled:\n  mariadb.x86_64 1:5.5.56-2.el7
                    \n\nComplete!\n"]}
META: ran handlers
META: ran handlers

PLAY RECAP **********************************************************************************
13.127.244.80              : ok=2    changed=1    unreachable=0    failed=0
```

12.yml

```
---
- name: variable example
  hosts: all
  vars:
    pkg: httpd

  tasks:
  - name: install package
    yum:
      name={{ pkg }}
      state=present
    notify: start service

  handlers:
    - name: start service
      service:
        name={{ pkg }}
        state=started
```

```
[root@ip-172-31-29-57 DevOps]# ansible-playbook 11.yml --check

PLAY [variable example] ***************************************************

TASK [Gathering Facts] ***************************************************
ok: [13.127.244.80]

TASK [install package] ***************************************************
changed: [13.127.244.80]

RUNNING HANDLER [start service] *****************************************
changed: [13.127.244.80]

PLAY RECAP ***************************************************
13.127.244.80              : ok=3    changed=2    unreachable=0    failed=0
```

ansible-playbook 12.yml --extra-vars "pkg=samba"

16.yml

- name: Playbook with multiple items in variables

  hosts: all

  vars:

    package:

    - samba

    - httpd

    - ntp

  tasks:

  - name: Install required packages

    yum:

      name={{ package }}

      state=installed


```
[root@ip-172-31-29-57 Ansible]# ansible-playbook 16.yml -v
Using /etc/ansible/ansible.cfg as config file

PLAY [Playbook with multiple items in variables] *****************************************

TASK [Gathering Facts] ******************************************************************
ok: [13.127.244.80]

TASK [Install required packages] ********************************************************
changed: [13.127.244.80] => {"changed": true, "msg": "", "rc": 0, "results": ["Loaded plugins: amazon-id, rhui-lb, search-disabled-repos\nResolving Dependencies\n--> Ru
nning transaction check\n---> Package httpd.x86_64 0:2.4.6-80.el7 will be installed\n---> Package ntp.x86_64 0:4.2.6p5-28.el7 will be installed\n---> Package samba.x86_
64 0:4.7.1-6.el7 will be installed\n--> Finished Dependency Resolution\n\nDependencies Resolved\n\n================================================================
==========\n Package  Arch     Version        Repository                Size\n================================================================
======\nInstalling:\n httpd   x86_64   2.4.6-80.el7    rhui-REGION-rhel-server-releases   1.2 M\n ntp    x86_64   4.2.6p5-28.el7   rhui-REGION-rhel-server-rele
ases   549 k\n samba   x86_64   4.7.1-6.el7     rhui-REGION-rhel-server-releases   661 k\n\nTransaction Summary\n================================================
============================\nInstall  3 Packages\n\nTotal download size: 2.4 M\nInstalled size: 7.0 M\nDownloading packages:\n-----------------------------
----------------------------------\nTotal                            4.6 MB/s | 2.4 MB  00:00    \nRunning transaction check\nRunning transac
tion test\nTransaction test succeeded\nRunning transaction\n  Installing : samba-4.7.1-6.el7.x86_64                      1/3 \n  Installing : ntp-4.2.6p5
-28.el7.x86_64                       2/3 \n  Installing : httpd-2.4.6-80.el7.x86_64                      3/3 \n  Verifying  : httpd-2.4.6-80.
el7.x86_64                       1/3 \n  Verifying  : ntp-4.2.6p5-28.el7.x86_64                      2/3 \n  Verifying  : samba-4.7.1-6.el7.x
86_64                        3/3 \n\nInstalled:\n  httpd.x86_64 0:2.4.6-80.el7       ntp.x86_64 0:4.2.6p5-28.el7       \n  samba.x86_64 0:4.7.1-6.
el7        \n\nComplete!\n"]}

PLAY RECAP *****************************************************************************
13.127.244.80              : ok=2    changed=1    unreachable=0    failed=0
```

17.yml

```yaml
---
 - name: Playbook with multiple items in variables
   hosts: all
   vars:
     package_n:
      - samba
      - httpd
      - ntp
     service_n:
      - smb
      - httpd
      - ntpd

   tasks:
   - name: Install required packages
     yum:
       name={{ package_n[1] }}
       state=installed
   - service:
       name={{ service_n[1] }}
       state=started
```

[root@ip-172-31-29-57 Ansible]# ansible-playbook 17.yml -v
Using /etc/ansible/ansible.cfg as config file

PLAY [Playbook with multiple items in variables] ******************************

TASK [Gathering Facts] **
ok: [13.127.244.80]

TASK [Install required packages] **
changed: [13.127.244.80] => {"changed": true, "msg": "", "rc": 0, "results": ["Loaded plugins: amazon-id, rhui-lb, search-disabled-repos\nResolving Dependencies\n--> Ru
nning transaction check\n---> Package httpd.x86_64 0:2.4.6-80.el7 will be installed\n--> Finished Dependency Resolution\n\nDependencies Resolved\n\n=====================
===\n Package   Arch   Version   Repository   Size\n======================
===\nInstalling:\n httpd   x86_64   2.4.6-80.el7   rhui-REGION-rhel-server-releases   1.2 M\n\nTransaction Sum
mary\n==\nInstall 1 Package\n\nTotal download size: 1.2 M\nInstalled size: 3.7 M\nDownloa
ding packages:\nRunning transaction check\nRunning transaction test\nTransaction test succeeded\nRunning transaction\n Installing : httpd-2.4.6-80.el7.x86_64
                1/1 \n Verifying : httpd-2.4.6-80.el7.x86_64   1/1 \n\nInstalled:\n httpd.x86_64 0:2.4.6-80.el7
                  \n\nComplete!\n"]}

TASK [service] **
changed: [13.127.244.80] => {"changed": true, "name": "httpd", "state": "started", "status": {"ActiveEnterTimestampMonotonic": "0", "ActiveExitTimestampMonotonic": "0",
 "ActiveState": "inactive", "After": "-.mount remote-fs.target basic.target nss-lookup.target tmp.mount systemd-journald.socket network.target system.slice", "AllowIsol
ate": "no", "AmbientCapabilities": "0", "AssertResult": "no", "AssertTimestampMonotonic": "0", "Before": "shutdown.target", "BlockIOAccounting": "no", "BlockIOWeight":
"18446744073709551615", "CPUAccounting": "no", "CPUQuotaPerSecUSec": "infinity", "CPUSchedulingPolicy": "0", "CPUSchedulingPriority": "0", "CPUSchedulingResetOnFork":
no", "CPUShares": "18446744073709551615", "CanIsolate": "no", "CanReload": "yes", "CanStart": "yes", "CanStop": "yes", "CapabilityBoundingSet": "18446744073709551615",
"ConditionResult": "no", "ConditionTimestampMonotonic": "0", "Conflicts": "shutdown.target", "ControlPID": "0", "DefaultDependencies": "yes", "Delegate": "no", "Descrip
tion": "The Apache HTTP Server", "DevicePolicy": "auto", "Documentation": "man:httpd(8) man:apachectl(8)", "EnvironmentFile": "/etc/sysconfig/httpd (ignore_errors=no)",
"ExecMainCode": "0", "ExecMainExitTimestampMonotonic": "0", "ExecMainPID": "0", "ExecMainStartTimestampMonotonic": "0", "ExecMainStatus": "0", "ExecReload": "{ path=/u

14.yml - Debug

```yaml
---
- name: variable example
  hosts: all
  vars_files:
    - variable.yml

  tasks:
  - debug:
      msg: "Package Name: {{ pkg }} , Service Name: {{ pkg_service }}"

  - name: install package
    yum:
      name={{ pkg }}
      state=present

  - name: start service
    service:
      name={{ pkg_service }}
      state=started
```

```
[root@ip-172-31-29-57 DevOps]# ansible-playbook 13.yml

PLAY [variable example] ********************************************************

TASK [Gathering Facts] ********************************************************
ok: [13.127.244.80]

TASK [debug] ********************************************************
ok: [13.127.244.80] => {
    "msg": "Package Name: samba , Service Name: smb"
}

TASK [install package] ********************************************************
changed: [13.127.244.80]

TASK [start service] ********************************************************
changed: [13.127.244.80]

PLAY RECAP ********************************************************
13.127.244.80                : ok=4    changed=2    unreachable=0    failed=0
```

18.yml

```
---
  - hosts: all
    tasks:
    - debug:
      msg={{ ansible_eth0.ipv4.address }} # ,{{ ansible_eth0['ipv4']['address'] }}
```

```
[root@ip-172-31-29-57 Ansible]# ansible-playbook 18.yml

PLAY [all] ***************************************************************

TASK [Gathering Facts] **************************************************
ok: [13.127.244.80]

TASK [debug] ************************************************************
ok: [13.127.244.80] => {
    "msg": "172.31.29.138"
}

PLAY RECAP **************************************************************
13.127.244.80              : ok=2    changed=0    unreachable=0    failed=0
```

19.yml – stop gathering facts

```yaml
---
  - hosts: all
    gather_facts: no #yes
    tasks:
    - debug:
        msg={{ ansible_eth0.ipv4.address }} # ,{{ ansible_eth0['ipv4']['address'] }}
```



```
[root@ip-172-31-29-57 Ansible]# ansible-playbook 19.yml


PLAY [all] **********************************************************************************


TASK [debug] *******************************************************************************
fatal: [13.127.244.80]: FAILED! => {"msg": "The task includes an option with an undefined variable. The error was: 'ansible_eth0' is undefined\n\nThe error appears to h
ave been in '/tmp/Ansible/19.yml': line 5, column 7, but may\nbe elsewhere in the file depending on the exact syntax problem.\n\nThe offending line appears to be:\n\n
  tasks:\n    - debug:\n      ^ here\n")
        to retry, use: --limit @/tmp/Ansible/19.retry


PLAY RECAP *********************************************************************************
13.127.244.80              : ok=0    changed=0    unreachable=0    failed=1
```

Jinja2 Expressions

► Ansible uses expressions and built-ins with **when, changed_when,** and **failed_when.**

► Jinja2 allows the definition of literals like strings ("string"), integers (42), floats (42.33), lists ([1,2, 3]), tuples (like lists, but can't be modified) dictionaries ({key: value, key2: value2}), and booleans (true or false).

► Jinja2 also allows basic math operations, like addition, subtraction, multiplication and division, and comparisons (== for equality, != for inequality, >= for greater than or equal to, etc.).

► Logical operators are and, or, and not, and you can group expressions by placing them within parenthesis.

Templates

▶ Ansible embeds the **Jinja2 templating engine** that can be used to dynamically:

❖ Set and modify play variables

❖ Conditional logic

❖ Generate files such as configurations from variables

Conditionals

- ► Ansible supports the conditional execution of a task based on the run-time evaluation of variable, fact, or previous task result.

```
- yum:

    name: httpd

    state: latest
  when: ansible_os_family  == "RedHat"
```

Ansible use 'default' callback plugin to display output, but you can use 'skippy' callback plugin instead of 'default'. 'skippy' use 'default' except for skipped tasks.

To use 'skipped' plugin, add following line (or uncomment it) in your ansible.cfg file:
stdout_callback = skippy

21.yml - when

```
---
- name: "Example for when"
  hosts: all
  vars:
    is_package: false #true

  tasks:
  - yum:
      name=httpd
      state=present
    when: is_package
```

```
[root@ip-172-31-29-57 Ansible]# ansible-playbook 21.yml

PLAY [Example for when] ***********************************************

TASK [Gathering Facts] ***********************************************
ok: [13.127.244.80]

TASK [yum] ***********************************************************
skipping: [13.127.244.80]

PLAY RECAP **********************************************************
13.127.244.80              : ok=1    changed=0    unreachable=0    failed=0
```

22.yml

- name: "Example for when"

  hosts: all

  vars:

    is_package: false #true

  tasks:

- yum:

    name=httpd

    state=present

  when: (is_package is defined) and is_package # undefined => defined # or => and

```
[root@ip-172-31-29-57 Ansible]# ansible-playbook 22.yml

PLAY [Example for when] ********************************************************

TASK [Gathering Facts] ********************************************************
ok: [13.127.244.80]

TASK [yum] ********************************************************************
skipping: [13.127.244.80]

PLAY RECAP ********************************************************************
13.127.244.80              : ok=1    changed=0    unreachable=0    failed=0
```

23.yml – Registered variable

▶ In Ansible, any play can 'register' a variable, and once registered, that variable will be available to all subsequent tasks.

```
---

 - hosts: all

   tasks:

    - yum: list=httpd

      register: result


   - debug: var=result

     when: ansible_os_family == "RedHat"
```



```
[root@ip-172-31-29-57 Ansible]# ansible-playbook 23.yml

PLAY [all] *************************************************************

TASK [Gathering Facts] ************************************************
ok: [13.127.244.80]

TASK [yum] ************************************************************
ok: [13.127.244.80]

TASK [debug] *********************************************************
ok: [13.127.244.80] => {
    "result": {
        "changed": false,
        "failed": false,
        "results": [
```

24.yml

```
---

 - name: "Downgrade PHP version if the curr
   hosts: all

   tasks:
     - shell: php --version
       register: php_version

     - debug: var=php_version

     - shell: yum -y downgrade php*
       when: '"5.4' in php_version.stdout"
       register: php_version

     - debug: var=php_version
```

```
[root@ip-172-31-29-57 Ansible]# ansible-playbook 24.yml

PLAY [Downgrade PHP version if the current version contains '7.0'.] **********

TASK [Gathering Facts] ******************************************************
ok: [13.127.244.80]

TASK [shell] ****************************************************************
changed: [13.127.244.80]

TASK [debug] ****************************************************************
ok: [13.127.244.80] => {
    "php_version": {
        "changed": true,
        "cmd": "php --version",
        "delta": "0:00:00.015696",
        "end": "2018-06-23 07:59:56.853751",
        "failed": false,
        "rc": 0,
        "start": "2018-06-23 07:59:56.838055",
        "stderr": "",
        "stderr_lines": [],
        "stdout": "PHP 5.4.16 (cli) (built: Oct  4 2017 03:09:42) \nCopyright
",
        "stdout_lines": [
            "PHP 5.4.16 (cli) (built: Oct  4 2017 03:09:42) ",
            "Copyright (c) 1997-2013 The PHP Group",
            "Zend Engine v2.4.0, Copyright (c) 1998-2013 Zend Technologies"
        ]
    }
}
```