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# **ansible-runner-role Documentation**

***Release 1.2.1***

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This [role](#) and the documentation is work in progress. Please feel free to [share your feedback and report issues](#). Contributions are welcome.



## USER'S GUIDE

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## 1.1 Introduction

Run this role to install and configure Ansible Runner. Optionally configure cron to periodically run Ansible playbooks.

- Ansible role: [ansible\\_runner](#)
- Supported systems:
  - [FreeBSD Supported Production Releases](#)
  - [Ubuntu Supported Releases](#)
- (Requirements in future releases: [ansible\\_lib](#))

---

### Note:

- The utility *ansible-runner* is not part of standard Ansible installation. See [Installing Ansible Runner](#)

**See also:**

- [Ansible Runner documentation](#)
- [Ansible Runner source code](#)
- [REST API ansible-runner-service](#)

## 1.2 Installation

The most convenient way how to install an Ansible role is to use Ansible Galaxy CLI `ansible-galaxy`. The utility comes with the standard Ansible package and provides the user with a simple interface to the Ansible Galaxy's services. For example, take a look at the current status of the role

```
shell> ansible-galaxy info vbotka.ansible_runner
```

and install it

```
shell> ansible-galaxy install vbotka.ansible_runner
```

Install the library of tasks (for future releases)

```
shell> ansible-galaxy install vbotka.ansible_lib
```

**See also:**

- To install specific versions from various sources see [Installing content](#).
- Take a look at other roles `shell> ansible-galaxy search --author=vbotka`

## 1.3 Playbook

Below is a simple playbook that calls this role at a single host `srv.example.com` (2)

```
1 shell> cat ansible-runner.yml
2 - hosts: srv.example.com
3   gather_facts: true
4   connection: ssh
5   remote_user: admin
6   become: yes
7   become_user: root
8   become_method: sudo
9   roles:
10    - vbotka.ansible_runner
```

---

**Note:** `gather_facts: true` (3) must be set to gather facts needed to evaluate OS-specific options of the role. For example to install packages the variable `ansible_os_family` is needed to select the appropriate Ansible module.

---

**See also:**

- For details see [Connection Plugins](#) (4-5)



- See also [Understanding Privilege Escalation \(6-8\)](#)

## 1.4 Debug

To see additional debug information enable debug output in the configuration

```
ar_debug: true
```

, or set the extra variable in the command

```
shell> ansible-playbook ansible-runner.yml -e 'ar_debug=true'
```

---

**Note:** The debug output of this role is optimized for the **yaml** callback plugin. Set this plugin for example in the environment `shell> export ANSIBLE_STDOUT_CALLBACK=yaml`.

---

**See also:**

- [Playbook Debugger](#)

## 1.5 Tags

The tags provide the user with a very useful tool to run selected tasks of the role. To see what tags are available list the tags of the role with the command

```
shell> ansible-playbook ansible-runner.yml --list-tags

playbook: ansible-runner.yml

play #1 (srv.example.com): srv.example.com TAGS: []
    TASK TAGS: [always, ar_config, ar_debug, ar_links, ar_packages, ar_vars]
```

For example, display the list of the variables and their values with the tag `ar_debug` (when the debug is enabled `ar_debug: true`)

```
shell> ansible-playbook ansible-runner.yml -t ar_debug
```

See what packages will be installed

```
shell> ansible-playbook ansible-runner.yml -t ar_packages --check
```

Install packages and exit the play

```
shell> ansible-playbook ansible-runner.yml -t ar_packages
```

## 1.6 Tasks

Test single tasks at single remote host `test_01`. Create a playbook

```
shell> cat ansible.yml
- hosts: test_01
  become: true
  roles:
    - vbotka.ansible_runner
```

Customize configuration in `host_vars/test_01/ar-*.yaml` and check the syntax

```
shell> ansible-playbook ansible-runner.yml --syntax-check
```

Then dry-run the selected task and see what will be changed. Replace `<tag>` with valid tag.

```
shell> ansible-playbook ansible-runner.yml -t <tag> --check --diff
```

When all seems to be ready run the command. Run the command twice and make sure the playbook and the configuration is idempotent

```
shell> ansible-playbook ansible-runner.yml -t <tag>
```

### 1.6.1 Ansible Runner packages

#### Synopsis

`ansible-runner` can be installed by `pip` or from distribution's packages, and ports.

See also:

- Annotated Source code [packages.yml](#)

#### Examples

##### Example 1: Install ansible-runner in Ubuntu by pip for admin

Create a playbook

```
shell> ansible-runner.yml
- hosts: test_01
  become: true
  roles:
    - vbotka.ansible_runner
```

Create `host_vars/test_01/ansible-runner.yml`

```
shell> cat host_vars/test_01/ansible-runner.yml
ar_install: false
ar_pip_install: true
ar_debug: false
ar_owner: admin
```

Install ansible-runner

```
shell> ansible-playbook ansible-runner.yml -e "ar_install=true"
...
```

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```
TASK [vbotka.ansible_runner : packages: Install Ansible Runner pip packages for_
↪admin]
ok: [test_01] => (item={'name': 'ansible-runner'})
```

Show ansible-runner package installed by pip for admin

```
shell> whoami
admin

shell> pip list | grep ansible-runner
ansible-runner      1.4.6
```

## Example 2: Install ansible-runner in FreeBSD from the port

Create a playbook

```
shell> ansible-runner.yml
- hosts: test_01
  become: true
  roles:
    - vbotka.ansible_runner
```

Create *host\_vars/test\_01/ansible-runner.yml*

```
shell> cat host_vars/test_01/ansible-runner.yml
<TBD>
```

Install ansible-runner

```
shell> ansible-playbook ansible-runner.yml -e "ar_install=true"
<TBD>
...
TASK [vbotka.ansible_runner : packages: Install Ansible Runner pip packages for_
↪admin]
ok: [test_01] => (item={'name': 'ansible-runner'})
```

Show ansible-runner package installed by pip for admin

```
<TBD>
shell> whoami

shell> which ansible-runner
ansible-runner      1.4.6
```

## Example 3: Run Ansible playbooks in cron

ssh-agent is needed to provide the ssh connection plugin with the password to the private key, when used. The script below is executed by the command interpreter for login shells

```
1 cntrlr> cat /home/admin/.profile
2 if [ -n "$BASH_VERSION" ]; then
3     if [ -f "$HOME/.bashrc" ]; then
```

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```

4      . "$HOME/.bashrc"
5  fi
6  if [ -f "$HOME/.bashrc_ssh" ]; then
7      . "$HOME/.bashrc_ssh"
8  fi
9  fi
10 if [ -d "$HOME/bin" ] ; then
11     PATH="$HOME/bin:$PATH"
12 fi

```

and will start ssh-agent on login and prepare *SSH\_ENV* (5)

```

1 cntrlr> cat /home/admin/.bashrc_ssh
2 SSH_ENV="$HOME/.ssh/environment"
3 function start_agent {
4     echo "Initialising new SSH agent..."
5     /usr/bin/ssh-agent | sed 's/^echo/#echo/' > "${SSH_ENV}"
6     echo succeeded
7     chmod 600 "${SSH_ENV}"
8     . "${SSH_ENV}" > /dev/null
9     /usr/bin/ssh-add;
10 }
11 if [ -f "${SSH_ENV}" ]; then
12     . "${SSH_ENV}" > /dev/null
13     #ps ${SSH_AGENT_PID} doesn't work under cywgin
14     ps -ef | grep ${SSH_AGENT_PID} | grep ssh-agent$ > /dev/null || {
15         start_agent;
16     }
17 else
18     start_agent;
19 fi

```

Example of *.ssh/environment* created by *ssh-agent*

```

cntrlr> cat /home/admin/.ssh/environment
SSH_AUTH_SOCK=/tmp/ssh-8fUkZ7qOzVPs/agent.5214; export SSH_AUTH_SOCK;
SSH_AGENT_PID=5216; export SSH_AGENT_PID;
#echo Agent pid 5216;

```

See also:

- Start ssh-agent on login

Wrapper of *ansible-runner* will source *.ssh/environment* (9) and run the *playbook* from the *project* (10)

```

1 cntrlr> cat /home/admin/bin/arwrapper.sh
2 #!/bin/bash
3 runner=$HOME/bin/ansible-runner
4 project=$HOME/.ansible/runner/$2
5 playbook=${3:-all.yml}
6 case "$1" in
7     run)
8         echo $(date '+%Y-%m-%d %H:%M:%S') $0
9         source $HOME/.ssh/environment
10        $runner run $project -p $playbook
11        exit 0
12    ;;

```

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```

13     clean)
14         rm -rf $project/artifacts
15         exit 0
16         ;;
17     *)
18         printf "%0: run|clean project [playbook]\n"
19         exit 1
20         ;;
21 esac

```

The script below will use *arwrapper.sh* (9) to run the playbook *pb-01.yml* (7) in the projects *test\_01*, *test\_02*, and *test\_03* (6). If the command (9) succeeds the script will print *[OK]* report (14). If you don't want to receive email on success remove this line and optionally enable the cleaning of the artifacts (13)

```

1  cntrlr> cat /home/admin/bin/ansible-cron-test.sh
2  #!/bin/bash
3  marker=$(printf "%75s" | sed "s/ /.g")
4  rc=0
5  cmd=$HOME/bin/arwrapper.sh
6  projects="test_01 test_02 test_03"
7  playbook=pb-01.yml
8  for project in ${projects[@]}; do
9      if ! out=$( $cmd run $project $playbook ); then
10         rc=1
11         printf "[ERR] $out\n$marker\n"
12     else
13         # $cmd clean $project
14         printf "[OK] $project $playbook PASSED\n"
15     fi
16 done
17 exit $rc

```

Schedule the script in *cron*

```

cntrlr> whoami
admin
cntrlr> crontab -l
MAILTO=admin
#Ansible: Ansible runner daily test
50 20 * * * $HOME/bin/ansible-cron-test.sh

```

In our case the */etc/aliases* redirect the emails for *root* to the user *admin*. Cron will report the result of the script *ansible-cron-test.sh*. If you want to receive email on a failure only remove the *[OK]* report from the script and optionally clean the *artifacts*. The *artifacts* will be available for a review if the script fails

```

Date: Tue, 7 Jul 2020 20:50:06 +0200 (CEST)
From: Cron Daemon <root@cntrlr.example.com>
To: admin@cntrlr.example.com
Subject: Cron <admin@cntrlr> $HOME/bin/ansible-cron-test.sh

[OK] test_01 pb-01.yml PASSED
[OK] test_02 pb-01.yml PASSED
[OK] test_03 pb-01.yml PASSED

```

Example of the project's directory without the artifacts. The artifacts will be created by *ansible-runner*

```
cntrlr> tree /home/vlado/.ansible/runner/test_01
/home/admin/.ansible/runner/test_01
├── env
├── inventory
│   └── hosts
├── project
│   ├── ansible.cfg
│   ├── group_vars
│   ├── host_vars
│   └── pb-01.yml
```

**See also:**

- [Runner Input Directory Hierarchy](#)
- Example playbook how to create projects `pb-create-runner-private.yml`

Example of the project's artifacts

```
cntrl> tree /home/admin/.ansible/runner/test_01/artifacts/
/home/admin/.ansible/runner/test_01/artifacts
├── aaa5d36e-e8d4-432a-ab52-b69062c85311
│   ├── command
│   ├── fact_cache
│   ├── job_events
│   │   ├── 1-2b5c9412-f0c4-45dc-a425-5c8c29e37ec0.json
│   │   ├── 2-5ce0c5a2-1f02-cdab-8869-00000000001f.json
│   │   ├── 3-5ce0c5a2-1f02-cdab-8869-000000000021.json
│   │   ├── 4-28749e27-409a-46c4-9551-7ce80c02be83.json
│   │   ├── 5-997d90c1-6357-45c6-8df9-437c2940c74e.json
│   │   └── 6-6e41cf27-8c1e-4266-9ffb-8a54375bd4cc.json
│   ├── rc
│   ├── status
│   └── stdout
```

**See also:**

- [Runner Artifacts Directory Hierarchy](#)
- `ansible_lib: al_runner_events`

Example of a playbook used in the test

```
cntrlr> cat /home/admin/.ansible/runner/test_01/project/pb-01.yml
- hosts: test_01
  remote_user: admin
  gather_facts: no
  tasks:
    - debug:
        msg: TEST
```

**Example 1: Install ansible-runner in Ubuntu by pip for admin**

Create a playbook

```
shell> ansible-runner.yml
- hosts: test_01
  become: true
```

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```
roles:
  - vbotka.ansible_runner
```

Create *host\_vars/test\_01/ansible-runner.yml*

```
shell> cat host_vars/test_01/ansible-runner.yml
ar_install: false
ar_pip_install: true
ar_debug: false
ar_owner: admin
```

Install ansible-runner

```
shell> ansible-playbook ansible-runner.yml -e "ar_install=true"
...
TASK [vbotka.ansible_runner : packages: Install Ansible Runner pip packages for_
↪admin]
ok: [test_01] => (item={'name': 'ansible-runner'})
```

Show ansible-runner package installed by pip for admin

```
shell> whoami
admin

shell> pip list | grep ansible-runner
ansible-runner          1.4.6
```

## Example 2: Install ansible-runner in FreeBSD from the port

Create a playbook

```
shell> ansible-runner.yml
- hosts: test_01
  become: true
  roles:
    - vbotka.ansible_runner
```

Create *host\_vars/test\_01/ansible-runner.yml*

```
shell> cat host_vars/test_01/ansible-runner.yml
<TBD>
```

Install ansible-runner

```
shell> ansible-playbook ansible-runner.yml -e "ar_install=true"
<TBD>
...
TASK [vbotka.ansible_runner : packages: Install Ansible Runner pip packages for_
↪admin]
ok: [test_01] => (item={'name': 'ansible-runner'})
```

Show ansible-runner package installed by pip for admin

```
<TBD>
shell> whoami

shell> which ansible-runner
ansible-runner          1.4.6
```

### Example 3: Run Ansible playbooks in cron

ssh-agent is needed to provide the ssh connection plugin with the password to the private key, when used. The script below is executed by the command interpreter for login shells

```
1 cntrlr> cat /home/admin/.profile
2 if [ -n "$BASH_VERSION" ]; then
3     if [ -f "$HOME/.bashrc" ]; then
4         . "$HOME/.bashrc"
5     fi
6     if [ -f "$HOME/.bashrc_ssh" ]; then
7         . "$HOME/.bashrc_ssh"
8     fi
9 fi
10 if [ -d "$HOME/bin" ] ; then
11     PATH="$HOME/bin:$PATH"
12 fi
```

and will start ssh-agent on login and prepare *SSH\_ENV* (5)

```
1 cntrlr> cat /home/admin/.bashrc_ssh
2 SSH_ENV="$HOME/.ssh/environment"
3 function start_agent {
4     echo "Initialising new SSH agent..."
5     /usr/bin/ssh-agent | sed 's/^echo/#echo/' > "${SSH_ENV}"
6     echo succeeded
7     chmod 600 "${SSH_ENV}"
8     . "${SSH_ENV}" > /dev/null
9     /usr/bin/ssh-add;
10 }
11 if [ -f "${SSH_ENV}" ]; then
12     . "${SSH_ENV}" > /dev/null
13     #ps ${SSH_AGENT_PID} doesn't work under cywgin
14     ps -ef | grep ${SSH_AGENT_PID} | grep ssh-agent$ > /dev/null || {
15         start_agent;
16     }
17 else
18     start_agent;
19 fi
```

Example of *.ssh/environment* created by *ssh-agent*

```
cntrlr> cat /home/admin/.ssh/environment
SSH_AUTH_SOCK=/tmp/ssh-8fUkZ7qOzVPs/agent.5214; export SSH_AUTH_SOCK;
SSH_AGENT_PID=5216; export SSH_AGENT_PID;
#echo Agent pid 5216;
```

See also:

- Start ssh-agent on login



Wrapper of *ansible-runner* will source *.ssh/environment* (9) and run the *playbook* from the *project* (10)

```

1  cntrlr> cat /home/admin/bin/arwrapper.sh
2  #!/bin/bash
3  runner=$HOME/bin/ansible-runner
4  project=$HOME/.ansible/runner/$2
5  playbook=${3:-all.yml}
6  case "$1" in
7      run)
8          echo $(date '+%Y-%m-%d %H:%M:%S') $0
9          source $HOME/.ssh/environment
10         $runner run $project -p $playbook
11         exit 0
12         ;;
13     clean)
14         rm -rf $project/artifacts
15         exit 0
16         ;;
17     *)
18         printf "$0: run|clean project [playbook]\n"
19         exit 1
20         ;;
21 esac

```

The script below will use *arwrapper.sh* (9) to run the playbook *pb-01.yml* (7) in the projects *test\_01*, *test\_02*, and *test\_03* (6). If the command (9) succeeds the script will print *[OK]* report (14). If you don't want to receive email on success remove this line and optionally enable the cleaning of the artifacts (13)

```

1  cntrlr> cat /home/admin/bin/ansible-cron-test.sh
2  #!/bin/bash
3  marker=$(printf "%75s" | sed "s/ /.g")
4  rc=0
5  cmd=$HOME/bin/arwrapper.sh
6  projects="test_01 test_02 test_03"
7  playbook=pb-01.yml
8  for project in ${projects[@]}; do
9      if ! out=$( $cmd run $project $playbook ); then
10         rc=1
11         printf "[ERR] $out\n$marker\n"
12     else
13         # $cmd clean $project
14         printf "[OK] $project $playbook PASSED\n"
15     fi
16 done
17 exit $rc

```

Schedule the script in *cron*

```

cntrlr> whoami
admin
cntrlr> crontab -l
MAILTO=admin
#Ansible: Ansible runner daily test
50 20 * * * $HOME/bin/ansible-cron-test.sh

```

In our case the */etc/aliases* redirect the emails for *root* to the user *admin*. Cron will report the result of the script *ansible-cron-test.sh*. If you want to receive email on a failure only remove the *[OK]* report from the script and optionally clean the *artifacts*. The *artifacts* will be available for a review if the script fails

```
Date: Tue, 7 Jul 2020 20:50:06 +0200 (CEST)
From: Cron Daemon <root@cntrlr.example.com>
To: admin@cntrlr.example.com
Subject: Cron <admin@cntrlr> $HOME/bin/ansible-cron-test.sh

[OK] test_01 pb-01.yml PASSED
[OK] test_02 pb-01.yml PASSED
[OK] test_03 pb-01.yml PASSED
```

Example of the project's directory without the artifacts. The artifacts will be created by *ansible-runner*

```
cntrlr> tree /home/vlado/.ansible/runner/test_01
/home/admin/.ansible/runner/test_01
├── env
├── inventory
│   └── hosts
└── project
    ├── ansible.cfg
    ├── group_vars
    ├── host_vars
    └── pb-01.yml
```

### See also:

- [Runner Input Directory Hierarchy](#)
- Example playbook how to create projects `pb-create-runner-private.yml`

Example of the project's artifacts

```
cntrl> tree /home/admin/.ansible/runner/test_01/artifacts/
/home/admin/.ansible/runner/test_01/artifacts
├── aaa5d36e-e8d4-432a-ab52-b69062c85311
│   ├── command
│   ├── fact_cache
│   ├── job_events
│   │   ├── 1-2b5c9412-f0c4-45dc-a425-5c8c29e37ec0.json
│   │   ├── 2-5ce0c5a2-1f02-cdab-8869-00000000001f.json
│   │   ├── 3-5ce0c5a2-1f02-cdab-8869-000000000021.json
│   │   ├── 4-28749e27-409a-46c4-9551-7ce80c02be83.json
│   │   ├── 5-997d90c1-6357-45c6-8df9-437c2940c74e.json
│   │   └── 6-6e41cf27-8c1e-4266-9ffb-8a54375bd4cc.json
│   ├── rc
│   ├── status
│   └── stdout
```

### See also:

- [Runner Artifacts Directory Hierarchy](#)
- `ansible_lib: al_runner_events`

Example of a playbook used in the test

```
cntrlr> cat /home/admin/.ansible/runner/test_01/project/pb-01.yml
- hosts: test_01
  remote_user: admin
  gather_facts: no
  tasks:
```

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```
- debug:
  msg: TEST
```

## 1.7 Variables

In this chapter we describe role's default variables stored in the directory **defaults**.

**See also:**

- Ansible variable precedence: Where should I put a variable?

## 1.8 Default variables

<TBD>

[defaults/main.yml]

```

1  ---
2  # defaults ansible_runner
3
4  ar_install: true
5  ar_debug: false
6  ar_backup_conf: false
7
8  # Install distro packages or pip
9  # false - distro packages, true - pip
10 # ar_pip_install: false # OS specific variable see vars/defaults
11
12 # FreeBSD
13 freebsd_install_retries: 10
14 freebsd_install_delay: 5
15 freebsd_install_method: "packages"
16 # freebsd_install_method: "ports"
17 freebsd_use_packages: true
18
19 # Linux
20 linux_install_retries: 10
21 linux_install_delay: 5
22
23 # Python
24 pip_install_retries: 10
25 pip_install_delay: 5
26 # pip_extraargs: "" # Optional
27
28 # pip package dependent
29 # ar_pip_executable: "pip3" # OS specific variable see vars/defaults
30 # ar_pip_requirements: [] # Optional
31
32 # Configuration
33 ar_config: []
34
35 # Links
36 # ar_links: [] # OS specific variable see vars/defaults
```

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```
37
38 # EOF
39 ...
```

## 1.9 Best practice

Display the variables for debug if needed. Then disable this task `ar_debug: false` to speedup the playbook

```
shell> ansible-playbook ansible-runner.yml -t ar_debug
```

Install packages Then disable this task `ar_install: false` to speedup the playbook

```
shell> ansible-playbook ansible-runner.yml -t ar_packages \
      -e 'ar_install=true'
```

The role and the configuration data in the examples are idempotent. Once the installation and configuration have passed there should be no changes reported by *ansible-playbook* when running the playbook repeatedly. Disable debug, and install to speedup the playbook

```
shell> ansible-playbook ansible-runner.yml
```

## ANNOTATED SOURCE CODE

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    - \* *links.yml*
    - \* *packages.yml*
    - \* *vars.yml*

## 2.1 Tasks

### 2.1.1 main.yml

Synopsis: Tasks of the playbook.

Description of the task.

[main.yml]

```
1 ---
2 # tasks for ansible_runner
3
4 - import_tasks: vars.yml
5   tags: [ar_vars, always]
6
7 - import_tasks: debug.yml
8   when: ar_debug|bool
9   tags: [ar_debug, always]
10
11 - import_tasks: packages.yml
12   when: ar_install|bool
13   tags: ar_packages
14
```

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```

15 - import_tasks: links.yml
16   tags: ar_links
17
18 - import_tasks: config.yml
19   tags: ar_config
20
21 # EOF
22 ...

```

## 2.1.2 config.yml

Synopsis: Configure config.

Description of the task.

[config.yml]

```

1 ---
2
3 - name: "config: configure ansible-runner"
4   debug:
5     msg: No config
6     when: ar_debug|bool
7
8 # EOF
9 ...

```

## 2.1.3 debug.yml

Synopsis: Configure debug.

Description of the task.

[debug.yml]

```

1 ---
2
3 - name: "debug: Ansible Runner"
4   vars:
5     msg: |
6       ansible_os_family [{{ ansible_os_family }}]
7       ansible_distribution [{{ ansible_distribution }}]
8       ansible_distribution_major_version [{{ ansible_distribution_major_version }}]
9       ansible_distribution_version [{{ ansible_distribution_version }}]
10      ansible_distribution_release [{{ ansible_distribution_release }}]
11      ansible_python_version [{{ ansible_python_version }}]
12
13      ar_install [{{ ar_install }}]
14
15      freebsd_install_method [{{ freebsd_install_method }}]
16      freebsd_use_packages [{{ freebsd_use_packages }}]
17      freebsd_install_retries [{{ freebsd_install_retries }}]
18      freebsd_install_delay [{{ freebsd_install_delay }}]
19
20      linux_install_retries [{{ linux_install_retries }}]

```

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```

21     linux_install_delay [{{ linux_install_delay }}]
22
23     pip_install_retries [{{ pip_install_retries }}]
24     pip_install_delay [{{ pip_install_delay }}]
25     pip_extraargs [{{ pip_extraargs|default('UNDEFINED') }}]
26
27     ar_pip_install [{{ ar_pip_install }}]
28     ar_pip_executable [{{ ar_pip_executable }}]
29     ar_pip_requirements [{{ pip_requirements|default('UNDEFINED') }}]
30
31     ansible_user_id [{{ ansible_user_id }}]
32
33     ar_owner [{{ ar_owner }}]
34     ar_backup_conf [{{ ar_backup_conf }}]
35
36     ar_packages
37     {{ ar_packages|to_nice_yaml }}
38     ar_links
39     {{ ar_links|to_nice_yaml }}
40
41     ar_config
42     {{ ar_config|to_nice_yaml }}
43
44     debug:
45         msg: "{{ msg.split('\n') }}"
46
47     # EOF
48     ...

```

## 2.1.4 links.yml

Synopsis: Configure links.

Description of the task.

[links.yml]

```

1  ---
2
3  - name: "links: Create directories for links"
4    file:
5      state: "directory"
6      dest: "{{ item.dest|dirname }}"
7      loop: "{{ ar_links }}"
8
9  - name: "links: Create links"
10   file:
11     state: "link"
12     src: "{{ item.src }}"
13     dest: "{{ item.dest }}"
14     force: "{{ item.force|default(false) }}"
15     loop: "{{ ar_links }}"
16
17   # EOF
18   ...

```

## 2.1.5 packages.yml

Synopsis: Configure packages.

Description of the task.

[packages.yml]

```

1  ---
2
3  # packages -----
4
5  # FreeBSD
6  - name: "packages: Install Ansible Runner FreeBSD packages"
7    block:
8      - name: "packages: Install Ansible Runner packages FreeBSD"
9        pkgng:
10         name: "{{ item.name }}"
11         loop: "{{ ar_packages }}"
12         register: result
13         until: result is succeeded
14         retries: "{{ freebsd_install_retries }}"
15         delay: "{{ freebsd_install_delay }}"
16      - name: "packages: Debug FreeBSD packages"
17        when: ar_debug|bool
18        debug:
19          var: result
20    when:
21      - not ar_pip_install
22      - ansible_os_family == "FreeBSD"
23      - freebsd_install_method|lower == "packages"
24
25  - name: "packages: Install FreeBSD ports"
26    block:
27      - name: "packages: Install Ansible Runner ports FreeBSD"
28        portinstall:
29         name: "{{ item.name }}"
30         use_packages: "{{ freebsd_use_packages }}"
31         loop: "{{ ar_packages }}"
32         register: result
33         until: result is succeeded
34         retries: "{{ freebsd_install_retries }}"
35         delay: "{{ freebsd_install_delay }}"
36      - name: "packages: Debug FreeBSD ports"
37        when: ar_debug|bool
38        debug:
39          var: result
40    when:
41      - not ar_pip_install
42      - ansible_os_family == "FreeBSD"
43      - freebsd_install_method|lower == "ports"
44
45  # Linux
46  - name: "packages: Install Ansible Runner packages Linux"
47    block:
48      - name: "packages: Install Ansible Runner packages Linux"
49        package:
50         name: "{{ item.name }}"
51         loop: "{{ ar_packages }}"

```

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```

52     register: result
53     until: result is succeeded
54     retries: "{{ linux_install_retries }}"
55     delay: "{{ linux_install_delay }}"
56 - name: "packages: Debug Linux"
57   when: ar_debug|bool
58   debug:
59     var: result
60 when:
61   - not ar_pip_install
62   - ansible_os_family == "RedHat" or ansible_os_family == "Debian"
63
64 # pip -----
65 - name: "packages: Test {{ ar_pip_executable }} exists"
66   when: ar_pip_install
67   block:
68     - name: "packages: Stat {{ ar_pip_executable }}"
69       stat:
70         path: "{{ ar_pip_executable }}"
71       register: result
72     - name: "packages: Not exists {{ ar_pip_executable }}"
73       fail:
74         msg: "[ERROR] {{ ar_pip_executable }} does not exist."
75       when: not result.stat.exists
76
77 - name: "packages: Install Ansible Runner pip packages for {{ ar_owner }}"
78   when: ar_pip_install
79   become_user: "{{ ar_owner }}"
80   become: true
81   changed_when: false # Note 1.
82   pip:
83     name: "{{ item.name }}"
84     executable: "{{ ar_pip_executable }}"
85     version: "{{ item.version|default(omit) }}"
86     state: "{{ item.state|default(omit) }}"
87     extra_args: "{{ pip_extraargs|default(omit) }}"
88   loop: "{{ ar_packages }}"
89   register: result
90   until: result is succeeded
91   retries: "{{ pip_install_retries }}"
92   delay: "{{ pip_install_delay }}"
93
94 - name: "packages: Debug pip packages"
95   when:
96     - ar_pip_install
97     - ar_debug|bool
98   debug:
99     var: result
100
101 - name: "packages: Install Ansible Runner pip requirements for {{ ar_owner }}"
102   when:
103     - ar_pip_install
104     - ar_pip_requirements is defined
105   become_user: "{{ ar_owner }}"
106   become: true
107   changed_when: false # Note 1.
108   pip:

```

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```

109     requirements: "{{{ ar_pip_requirements }}}}"
110     executable: "{{{ ar_pip_executable }}}}"
111     extra_args: "{{{ pip_extraargs|default(omit) }}}}"
112     register: result
113     until: result is succeeded
114     retries: "{{{ pip_install_retries }}}}"
115     delay: "{{{ pip_install_delay }}}}"
116
117 - name: "packages: Debug pip requirements"
118   when:
119     - ar_pip_install
120     - ar_debug|bool
121   debug:
122     var: result
123
124 # Note 1.
125 # The pip module isn't always idempotent #28952
126 # https://github.com/ansible/ansible/issues/28952
127
128 # EOF
129 ...

```

## 2.1.6 vars.yml

Synopsis: Configure vars.

Description of the task.

[vars.yml]

```

1 ---
2
3 - name: "Declare ar_owner when undefined"
4   when: ar_owner is undefined
5   set_fact:
6     ar_owner: "{{{ ansible_user_id }}}}"
7
8 - name: "Default vars for {{{ ansible_os_family }}}
9           {{{ ansible_distribution }}}
10          {{{ ansible_distribution_release }}}}"
11   include_vars: "{{{ item }}}}"
12   with_first_found:
13     - files:
14         - "{{{ ansible_distribution }}}-{{{ ansible_distribution_release }}}.yaml"
15         - "{{{ ansible_distribution }}}.yaml"
16         - "{{{ ansible_os_family }}}.yaml"
17         - "defaults.yaml"
18         - "default.yaml"
19     paths: "{{{ role_path }}}/vars/defaults"
20
21 - name: "Custom vars for {{{ ansible_os_family }}}
22           {{{ ansible_distribution }}}
23           {{{ ansible_distribution_release }}}}"
24   include_vars: "{{{ item }}}}"
25   with_first_found:
26     - files:

```

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```
27     - "{{ ansible_distribution }}-{{ ansible_distribution_release }}.yaml"
28     - "{{ ansible_distribution }}.yaml"
29     - "{{ ansible_os_family }}.yaml"
30     - "defaults.yaml"
31     - "default.yaml"
32     paths: "{{ role_path }}/vars"
33
34     # EOF
35     . . .
```



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