
Ansible Tower 3.0 Upgrade and Migration

Release Ansible Tower 3.0

Red Hat, Inc.

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Thank you for your interest in Ansible Tower by Red Hat. Ansible Tower is a commercial offering that helps teams manage complex multi-tier deployments by adding control, knowledge, and delegation to Ansible-powered environments.

The *Ansible Tower 3.0 Upgrade and Migration Guide* discusses how to upgrade your Ansible Tower 2.4.4 (or later) system to the 3.0 version. The Ansible Tower 3.0 release introduces many updates and changes to Tower, including changes to the way upgrades are run and a completely rewritten RBAC system. This guide covers these and other related changes that you should keep in mind as you plan to migrate your data and prepare for this upgrade.

Ansible Tower Version 3.0; July 19, 2016; <https://access.redhat.com/>

RELEASE NOTES FOR ANSIBLE TOWER VERSION 3.0

- Added a notifications system for Tower which supports services like Slack, HipChat, IRC, etc.
- Added support for the new Azure inventory system and the latest Ansible Azure modules (legacy Azure inventory and credentials are still supported)
- Added support for keystone v3 which supports the latest Openstack versions
- Added counts and more detail to Organization endpoints (API)
- Added prompting for Job Templates
- Added labels for Job Templates
- Added support for user customization as Ansible tasks now run in their own environment
- Added support for new Ansible Network Credentials
- Added inventory support for Red Hat Cloudforms and Red Hat Satellite 6
- Added SUSE, OpenSuse, and Debian support for scan jobs
- Added a link to the schedule in the job detail view if the job was started as a result of a schedule
- Added survey spec management without requiring that surveys be enabled on job templates
- Added additional strict extra_vars validation. extra_vars passed to the job launch API are only honored if one of the following is true:
 - they correspond to variables in an enabled survey
 - ask_variables_on_launch is set to True
- Added a deprecation notice for Ubuntu 12 and RHEL 6
- Changed how Projects are linked so that they now tie singularly to an Organization
- Changed how system tracking and scan data are stored—now in postgres. MongoDB dependency removed.
- Discovered an issue with ECDSA credentials—if your Tower server has a version of OpenSSH that predates 5.7, jobs will fail when launched jobs with ECDSA credentials.
- Fixed issues with scan jobs on RHEL5
- Fixed an issue with the websocket service when Tower is run on CentOS or RHEL 7.2
- Fixed issues with Ansible's no_log causing errors or not hiding data when running jobs
- Fixed the way setting a license is done so that it propagates to standby Tower nodes in an HA configuration
- Fixed GCE credential handling and inventory filtering
- Improved (through a complete rewrite to expand and simplify) the Role-Based Access Control system in Tower

- Improved job templates so that multiple invocations of the same job template will only block if the job templates used the same inventory
- Improved the setup playbook so that it now hides potentially sensitive information from stdout and the setup log
- Improved the Setup process now supports installing and configuring postgres on a remote system
- Removed MongoDB and changed view queries to use a Postgres implementation
- Removed soft-deletes. Tower now permanently deletes removed objects. Removed utilities to manage the cleanup of those soft-deleted objects
- Removed Munin monitoring
- Updated the look and feel of the entire Tower UI for a more approachable and intuitive user experience
- Updated and simplified the Tower setup process so that new Tower installs are now preloaded with Organization, Inventory, Project, and Job Template demo data
- Updated the setup process to support installing and configuring Postgres on a remote system
- Updated dependencies
- Updated RHEL 6/CentOS 6 to use python 2.7 (for Tower only)
- Updated the minimum open file descriptor check and configuration by raising it from 1024 to 4096

UPGRADING ANSIBLE TOWER TO 3.0

Topics:

- *Upgrade Planning*
- *Obtaining Ansible Tower*
- *Setting up Passwords*
- *The Setup Playbook*

2.1 Upgrade Planning

This section covers changes that you should keep in mind as you attempt to upgrade your Ansible Tower Instance

- If you are not yet using a 2.4.x version of Ansible Tower, **do not** attempt to upgrade directly to Ansible Tower 3.0. You must start with a system which has a version of Tower 2.4.x installed or the upgrade will fail.
- Ansible Tower 3.0 simplifies installation and removes the need to run `./configure/` as part of the initial setup.
- The file `tower_setup_conf.yml` is no longer used. Instead, you should now edit the **inventory** file in the `/ansible-tower-setup-<tower_version>/` directory.
- Earlier versions of Tower used MongoDB when setting up an initial database; please note that Ansible Tower 3.0 has replaced the use of MongoDB with PostgreSQL.

2.2 Obtaining Ansible Tower

Download and then extract the Ansible Tower installation/upgrade tool: <http://releases.ansible.com/ansible-tower/setup/>

```
root@localhost:~$ tar xvzf ansible-tower-setup-latest.tar.gz
root@localhost:~$ cd ansible-tower-setup-<tower_version>
```

To install or upgrade, start by editing the `inventory` file in the `ansible-tower-setup-<tower_version>` directory, replacing `<tower_version>` with the version number, such as `2.4.5` or `3.0.0` directory.

2.3 Setting up Passwords

If you are performing an installation, you can supply any necessary passwords here.

For those who are upgrading, your prior configuration will migrate over and filling out the passwords in the inventory file is unnecessary.

```
admin_password='password'
redis_password='password'
pg_password='password'
```

As an example:

```
[primary]
localhost ansible_connection=local

[secondary]

[database]

[all:vars]
admin_password='password'
redis_password='password'

pg_host=''
pg_port=''

pg_database='awx'
pg_username='awx'
pg_password='password'
```

Once any necessary changes have been made, you are ready to run `./setup.sh`.

Note: Root access to the remote machines is required. With Ansible, this can be achieved in different ways:

- `ansible_ssh_user=root ansible_ssh_password="your_password_here"` inventory host or group variables
- `ansible_ssh_user=root ansible_ssh_private_key_file="path_to_your_keyfile.pem"` inventory host or group variables
- `ANSIBLE_BECOME_METHOD='sudo' ANSIBLE_BECOME=True ./setup.sh`
- `ANSIBLE_SUDO=True ./setup.sh`

2.4 The Setup Playbook

Note: Ansible Tower 3.0 simplifies installation and removes the need to run `./configure/` as part of the installation setup. Users of older versions should follow the instructions available in the v.2.4.5 (or earlier) releases of the Tower Documentation available at: <http://docs.ansible.com/>

The Tower setup playbook script uses the `inventory` file and is invoked as `./setup.sh` from the path where you unpacked the Tower installer tarball.

```
root@localhost:~$ ./setup.sh
```

The setup script takes the following arguments:

- `-i INVENTORY_FILE` – Path to Ansible inventory file (default: `inventory`)
- `-e EXTRA_VARS` – Set additional Ansible variables as `key=value` or `YAML/JSON` (i.e. `-e bundle_install=false` forces an online installation)
- `-b` – Perform a database backup in lieu of installing
- `-r` – Perform a database restore in lieu of installing
- `-h` – Show this help message and exit

SYSTEM TRACKING MIGRATION

Once your system has been upgraded to Ansible Tower 3.0, you will find that your system tracking data has been migrated from MongoDB to PostgreSQL. If you want to delete the old data in MongoDB, you can do so manually. First, connect to your mongo database using the mongo command line client, then run the following commands:

```
$ use system_tracking
$ db.runCommand( { dropDatabase: 1 } )
```

At this point, you can also remove the MongoDB packages.

ROLE-BASED ACCESS CONTROLS

Ansible Tower 3.0 has changed significantly around the way that the Role-Based Access Control (RBAC) system works. For the latest RBAC documentation, refer to the [Role-Based Access Controls](#) section in the Tower User Guide.

4.1 Enhanced and Simplified RBAC System

Based on user feedback, Ansible Tower both expands and simplifies its role-based access control. No longer is job template visibility configured via a combination of permissions on inventory, projects, and credentials. If you want to give any user or team permissions to use a job template, just assign permissions directly on the job template. Similarly, credentials are now full objects in Tower's RBAC system, and can be assigned to multiple users and/or teams for use.

A new 'Auditor' type has been introduced in Tower as well, who can see all aspects of the systems automation, but has no permission to run or change automation, for those that need a system-level auditor. (This may also be useful for a service account that scrapes automation information from Tower's API.)

4.2 Specific Changes to Note

There are a few changes you should keep in mind as you work with the RBAC system as redesigned for Ansible Tower version 3.0:

- You no longer set the "team" or "user" for a credential. Instead, you use Tower's RBAC system to grant ownership, auditor, or usage roles.
- Deletion of job run data is now restricted to system and organization administrators.
- Projects no longer have multiple organizations. You *must* provide an organization when creating a new project through the API:

```
- projects/:id/organizations --> removed
```

- New Auditor type in Tower has been added which can see all aspects of the systems automation but does not have permission to run or change things.

JOB TEMPLATE CHANGES

Job templates have been updated in Tower 3.0 to allow you more flexibility when creating and working with them.

5.1 Prompt on Launch

In prior versions of Ansible Tower, you could set “Prompt on Launch” against Extra Variables that you want to potentially pass through the job template. Now, starting with version 3.0, Ansible Tower allows you to prompt for an inventory selection, job type, and more.

Selecting “Prompt on Launch” means that even if a value is supplied at the time of the job template creation, the user launching the job will be prompted to supply new information or confirm what was entered in the job template originally.

The following job template settings allow for prompting at the time of launch:

- Job Type (run or check type jobs only, as scan jobs cannot be changed at the time of launch)
- Inventory
- Machine credential
- Limit
- Job Tags
- Extra variables

As you work with migrating your Tower 2.4.5 job templates to 3.0, please keep in mind the following:

- All “Prompt on Launch” fields are set to *False* by default after migrating to 3.0 (new job templates created also have all “Prompt on Launch” fields set to *False* by default).
 - With one exception for those upgrading from 2.4.5 to 3.0: if a credential used in Tower 2.4.5 was null, the credential will be prompted for in 3.0.
- If you have Job Templates with a null credential, in the migration from 2.4.5 to 3.0, “ask_credential_on_launch” is set to *True*.
 - Note that there was no way to set a default credential in 2.4.5. However, in 3.0, you can set a default credential and select to prompt the user at launch time to confirm the default credential or change it to something new.
- All other “ask_xx_on_launch” prompts are set to *False*.
- Starting with Tower 3.0, if “ask_variables_on_launch” is set to *False*, extra variables passed at launch time (via UI or API) that are not part of an enabled survey are ignored.
- While there are no changes to how “ask_variables_on_launch” behaves, keep in mind that these variables combine with survey answers.

5.2 Permissions/RBAC Notes

Job template visibility is no longer configured via a combination of permissions on inventory, projects, and credentials. Admins who want to give any user or team permissions to use a job template can quickly assign permissions directly on the job template. Similarly, credentials are now full objects in Tower’s RBAC system, and can be assigned to multiple users and/or teams for use.

If a job template a user has been granted execution capabilities on does not specify an inventory or credential, the user will be prompted at run-time to select among the inventory and credentials in the organization they own or have been granted usage capabilities.


Users that are job template administrators can make changes to job templates; however, to make changes to the inventory, project, playbook, or credentials used in the job template, the user must also have the “Use” role for the project, inventory, and all credentials currently being used or being set.

5.3 Surveys

In prior versions of Ansible Tower, you had to select a checkbox to “Enable Survey” on the Job Template before a button appeared allowing you to “Create Survey”.

Enabling and creating surveys is much simpler in Ansible Tower 3.0.



At the bottom of each job template is a button () which opens a new dialog where you can enter your survey questions and responses.

NEW JOB TEMPLATE | SURVEY ON ✕

ADD SURVEY PROMPT

* PROMPT

DESCRIPTION

* ANSWER VARIABLE NAME ?

* ANSWER TYPE

MINIMUM LENGTH MAXIMUM LENGTH

DEFAULT ANSWER

REQUIRED

PREVIEW

PLEASE ADD A SURVEY PROMPT ON THE LEFT.

Use the **ON/OFF** toggle button to quickly activate or deactivate this survey prompt.

Once you have entered the question information, click **Add** to add the survey prompt.

A stylized preview of the survey is presented, along with a **New Question** button. Click this button to add additional questions.

For any question, you can click on the **Edit** button to edit the question, the **Delete** button to delete the question, and click on the Up and Down arrow buttons to rearrange the order of the questions. Click **Save** to save the survey.

NEW JOB TEMPLATE | SURVEY ON

ADD SURVEY PROMPT

* PROMPT

DESCRIPTION

* ANSWER VARIABLE NAME ⓘ

* ANSWER TYPE

Choose an answer type ▼

REQUIRED

PREVIEW

* WHICH GROUP(S) SHOULD INCLUDE THIS USER?

Enter groups, one per line.

⋮

JOB OUTPUT VIEW CHANGES

With the update of the overall Tower user interface, it is worth noting the changes to how job results are displayed.

Job results for inventory syncs and SCM updates only show the Results and Standard Out of the job recently Run. Job results for playbook runs consist of Results, Standard Out, Details, and the Event Summary.

TOWER
PROJECTS INVENTORIES JOB TEMPLATES JOBS
admin

JOBS / 2 - DEMO JOB TEMPLATE

RESULTS

STATUS	● Successful	TEMPLATE	Demo Job Template
STARTED	7/11/2016 12:41:04 PM	JOB TYPE	Run
FINISHED	7/11/2016 12:41:11 PM	LAUNCHED BY	admin
ELAPSED	00:00:07	INVENTORY	Demo Inventory
PROJECT	Demo Project	PLAYBOOK	hello_world.yml
MACHINE CREDENTIAL	Demo Credential	VERBOSITY	Default

EXTRA VARIABLES

1

STANDARD OUT

```

PLAY [Hello World Sample] *****
TASK [setup] *****
ok: [localhost]
TASK [Hello Message] *****
ok: [localhost] => {
  "msg": "Hello World!"
}
PLAY RECAP *****
localhost : ok=2  changed=0  unreachable=0  failed=0
                    
```

DETAILS

1 Please select from a play below to view its associated tasks.

ALL FAILED

PLAYS	STARTED	ELAPSED
● Hello World Sample	12:41:09	00:00:02

2 Please select a task below to view its associated hosts

ALL FAILED

TASKS	STARTED	ELAPSED	HOST STATUS
● setup	12:41:09	00:00:01	1
● Hello Message	12:41:11	00:00:00	1

3 Please select a host below to view associated task details.

ALL FAILED

HOSTS	ITEM	MESSAGE
● localhost		

EVENT SUMMARY >

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For more details regarding Job Results, refer to [Jobs](#) in the *Ansible Tower User Guide*.

6.1 Results

The **Results** area shows the basic status of the job (*Running*, *Pending*, *Successful*, or *Failed*), its start and end times, which template was used, how long the job run took, who launched it, and more. The buttons in the top right of the Results view allow you to relaunch or delete the job.

By clicking on these Results entries, where appropriate, you can view the corresponding job templates, projects, and other Tower objects.

RESULTS 🚀 🗑️

STATUS	● Successful	TEMPLATE	Demo Job Template
STARTED	7/11/2016 12:41:04 PM	JOB TYPE	Run
FINISHED	7/11/2016 12:41:11 PM	LAUNCHED BY	admin
ELAPSED	00:00:07	INVENTORY	Demo Inventory
PROJECT	Demo Project	PLAYBOOK	hello_world.yml
MACHINE CREDENTIAL	Demo Credential	VERBOSITY	Default

EXTRA VARIABLES

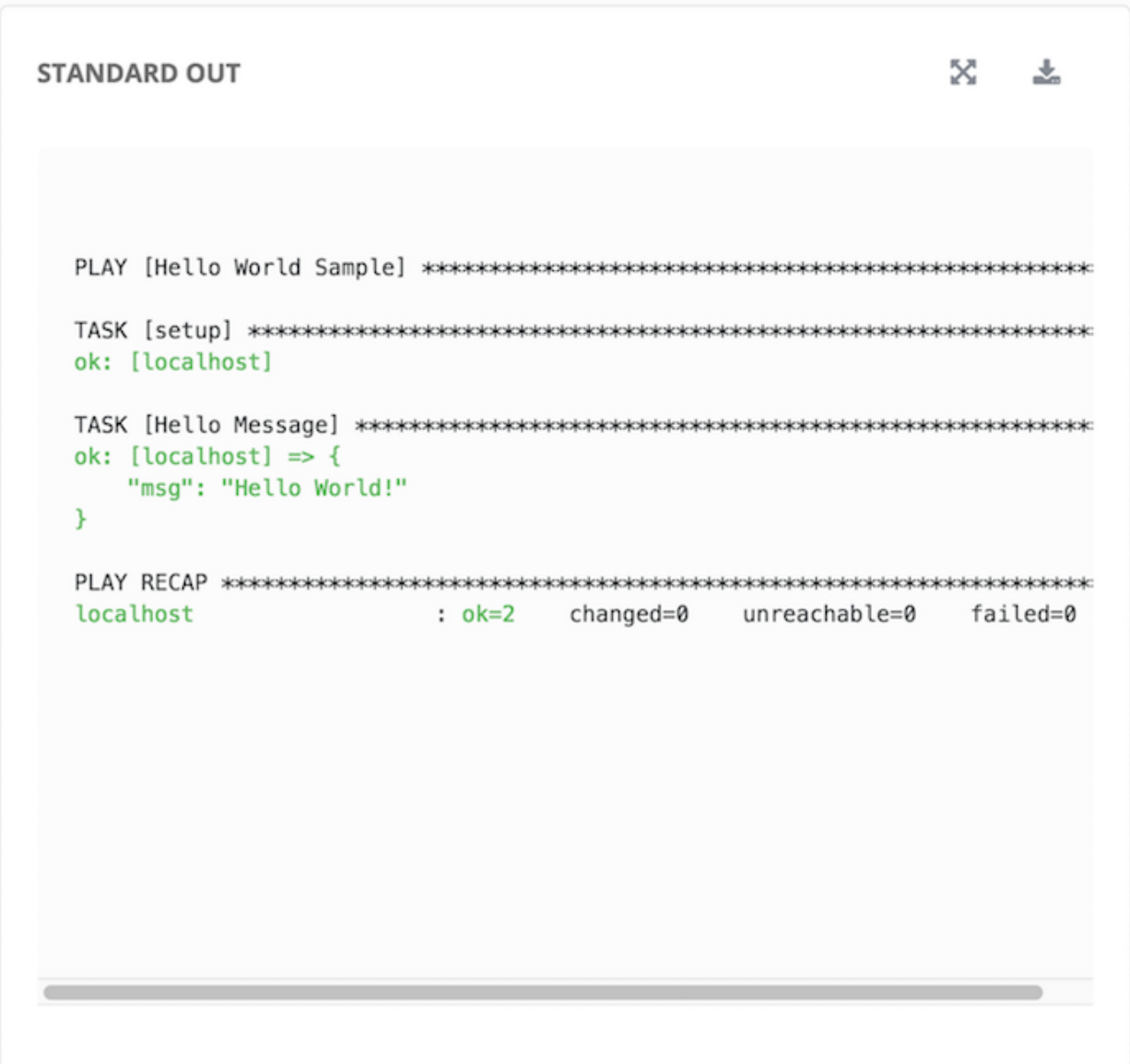
1	
---	--

6.2 Standard Out

The **Standard Out** display shows the full results of running the SCM Update or Inventory Sync playbook. This shows the same information you would see if you ran the Ansible playbook using Ansible from the command line, and can be useful for debugging.

Prior to Ansible Tower 3.0, the Standard Out was a separate display and was not included in the overall job results view.

The buttons in the top right corner of the Standard Out display allow you to toggle the output as a main view or to download the output.



```

STANDARD OUT
PLAY [Hello World Sample] *****
TASK [setup] *****
ok: [localhost]
TASK [Hello Message] *****
ok: [localhost] => {
  "msg": "Hello World!"
}
PLAY RECAP *****
localhost           : ok=2    changed=0    unreachable=0    failed=0
    
```

6.3 Job Details View

The Job Details view in Ansible Tower 3.0 now offers step-by-step views into Plays, Tasks, and Hosts, walking you through each section of the job results until you drill down into your host information.

DETAILS ▾

1 Please select from a play below to view its associated tasks.

ALL FAILED

PLAYS	STARTED	ELAPSED
● Hello World Sample	12:41:09	00:00:02

2 Please select a task below to view its associated hosts

ALL FAILED

TASKS	STARTED	ELAPSED	HOST STATUS
● setup	12:41:09	00:00:01	1
● Hello Message	12:41:11	00:00:00	1

3 Please select a host below to view associated task details.

ALL FAILED

HOSTS	ITEM	MESSAGE
● localhost		

6.3.1 Plays

The **Plays** area shows the plays that were run as part of this playbook. The displayed plays can be filtered by **Play Name**, and can be limited to show only failed plays (using the **ALL/FAIL** view toggle).

For each play, Tower shows the **Play Name**, start time for the play, the elapsed time of the play, the play **Name**, and whether the play succeeded or failed (indicated by the status dot to the left of the **pPlay Name**). Clicking on a specific play filters the **Tasks** and **Host Events** area to only display tasks and hosts relative to that selected play.

1 Please select from a play below to view its associated tasks.

ALL
FAILED

PLAYS	STARTED	ELAPSED
● Hello World Sample	12:41:09	00:00:02

6.3.2 Tasks

The **Tasks** area shows the tasks run as part of plays in the playbook. The displayed tasks can be filtered by **Task Name**, and can be limited to only failed tasks.

For each task, Tower shows the task **Name**, the start time for the task, the elapsed time of the task, whether the task succeeded or failed. Clicking on a specific task filters the **Host Events** area to only display hosts relative to that task.

2 Please select a task below to view its associated hosts

ALL
FAILED

TASKS	STARTED	ELAPSED	HOST STATUS
● setup	12:41:09	00:00:01	1
● Hello Message	12:41:11	00:00:00	1

6.3.3 Host Events

The **Host Events** area shows hosts affected by the selected play and task. For each host, Tower shows the host's status, its name, and any **Item** or **Message** set by that task.

3 Please select a host below to view associated task details.

ALL
FAILED

HOSTS	ITEM	MESSAGE
● localhost		

Clicking on the linked hostname brings up the **Host Event** dialog for that host and task.

The **Host Event** dialog shows the events for this host and the selected play and task.

There is also a **JSON** tab which displays the result in JSON format.

HOST EVENT
✕

DETAILS

JSON

EVENT	RESULTS
HOST localhost	MSG Hello World!
STATUS ● ok	_ANSIBLE_VER
ID 6	BOSE_ALWAYS
CREATED 2016-07-07T13:12:44.215Z	S true
PLAY Hello World Sample	_ANSIBLE_NO
TASK Hello Message	_LOG false
MODULE No result found	

PREV HOST

NEXT HOST

CLOSE

There is also a **JSON** tab which displays the result in JSON format.

```
1 {
2   "id": 6,
3   "created": "2016-07-07T13:12:44.215Z",
4   "modified": "2016-07-07T13:12:44.215Z",
5   "job": 4,
6   "event": "runner_on_ok",
7   "counter": 6,
8   "event_display": "Host OK",
9   "event_level": 3,
10  "failed": false,
11  "changed": false,
12  "host": 1,
13  "host_name": "localhost",
14  "parent": 4,
15  "play": "Hello World Sample",
16  "task": "Hello Message",
17  "role": ""
18 }
```

6.4 Event Summary

The **Event Summary** area shows a summary of events for all hosts affected by this playbook as well as the **Host Status Summary**.

By default, the **Event Summary** is collapsed and must be expanded before it can be viewed. Versions of Tower prior to 3.0 always displayed the **Event Summary**.

Hosts can be filtered by their hostname, and can be limited to showing only changed, failed, OK, and unreachable hosts.

EVENT SUMMARY ▾


4 Please select a host below to view a summary of all associated tasks.

HOST NAME

HOSTS	COMPLETED TASKS
localhost	2

HOST STATUS SUMMARY

● OK: 100%



For each host, the **Event Summary** area shows the hostname and the number of completed tasks for that host, sorted by status.

EVENT SUMMARY ▾

4 Please select a host below to view a summary of all associated tasks.

ALL
FAILED

HOSTS	COMPLETED TASKS
localhost	2

Clicking on the hostname brings up a **Host Events** dialog, displaying all tasks that affected that host.

This dialog can be filtered by the status of the tasks, as well as by the hostname.

For each event, Tower displays the status, the play name, and the task name.

HOST EVENTS | LOCALHOST ✕

All
▾

STATUS	PLAY	TASK
● ok	Hello World Sample	setup
● ok	Hello World Sample	Hello Message

OK

The **Host Summary** area shows a graph summarizing the status of all hosts affected by this playbook run.

HOST STATUS SUMMARY

● OK: 100%



USING VIRTUALENV WITH ANSIBLE TOWER

Ansible Tower 3.0 uses *virtualenv*. Virtualenv creates isolated Python environments to avoid problems caused by conflicting dependencies and differing versions. Virtualenv works by simply creating a folder which contains all of the necessary executables and dependencies for a specific version of Python. Ansible Tower creates two virtualenvs during installation—one is used to run Tower, while the other is used to run Ansible. This allows Tower to run in a stable environment, while allowing you to add or update modules to your Ansible Python environment as necessary to run your playbooks.

Note: For more information on virtualenv, see [Virtual Environments](#)

7.1 Modifying the virtualenv

Modifying the virtualenv used by Tower is unsupported and not recommended. Instead, you can add modules to the virtualenv that Tower uses to run Ansible.

To do so, activate the Ansible virtualenv:

```
. /var/lib/awx/venv/ansible/bin/activate
```

...and then install whatever you need using `pip`:

```
pip install mypackagename
```

7.2 Tower virtualenv under Red Hat Enterprise Linux 6 and derivatives

Red Hat Enterprise Linux 6 and derivatives (including CentOS 6 and Oracle Linux 6) use Python version 2.6. However, Tower 3.0 requires several components (most notably Django 1.8) that require Python 2.7, so the Python 2.7 [software collection](#) is installed with Ansible Tower on these platforms. Note that this is only used to run Tower, not Ansible. Ansible still runs under the system Python 2.6. As a result, the two virtualenvs under `/var/lib/awx/venv` will each target a different Python interpreter.

- genindex

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