Ansible Tower Upgrade and Migration

Release Ansible Tower 3.8.1

Red Hat, Inc.

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CONTENTS

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

Note: You must upgrade your Ansible Tower to Ansible Tower 3.6 before you can upgrade to Ansible Tower 3.8.0.

We Need Feedback!

If you spot a typo in this documentation, or if you have thought of a way to make this manual better, we would love to hear from you! Please send an email to: docs@ansible.com

If you have a suggestion, try to be as specific as possible when describing it. If you have found an error, please include the manual's title, chapter number/section number, and some of the surrounding text so we can find it easily. We may not be able to respond to every message sent to us, but you can be sure that we will be reading them all!

Ansible Tower Version 3.8.1; January 13, 2021; https://access.redhat.com/

CHAPTER

ONE

RELEASE NOTES FOR ANSIBLE TOWER VERSION 3.8.1

1.1 Ansible Tower Version 3.8.1

- Improved analytics collection to collect the playbook status for all hosts in a playbook run
- Updated nginx on RHEL 7 to address CVE-2019-20372
- Updated autobahn to address CVE-2020-35678
- Updated the installer to ensure Automation Hub repositories are only enabled while running the installer
- Updated the installer to allow it to pin a specific version of Automation Hub that needs to be installed
- Added aggregation support for applying multiple subscriptions to a single Tower installation
- Fixed the installer to only install the DB where it belongs and not on all nodes
- Fixed the installer to only check the RHSM Automation Hub repository when not using a bundled installer
- Fixed Tower to properly handle certain uploaded subscription manifests
- Fixed Tower to properly respect the configured destination port when interacting with Red Hat Satellite 6 to obtain licensing/entitlement data
- Fixed an error in the module documentation for the tower_license module
- Fixed inventory updates from Satellite 6 and Tower to no longer fail unexpectedly
- Fixed AWS inventory hosts to now properly track across inventory updates

CHAPTER

TWO

UPGRADING TO ANSIBLE AUTOMATION PLATFORM

Starting with Ansible Tower 3.8, Automation Hub will act as a content provider for Ansible Tower, which requires both an Ansible Tower deployment and an Automation Hub deployment running alongside each other. The Ansible Automation Platform installer contains both of these. This section covers each component of the upgrading process:

Note: All upgrades should be no more than two major versions behind what you are currently upgrading to. For example, in order to upgrade to Ansible Tower 3.7.x, you must first be on version 3.5.x; i.e., there is no direct upgrade path from version 3.4.x or earlier. Refer to the recommended upgrade path article on the Red Hat customer portal.

In order to run Ansible Tower 3.8, you must also have Ansible 2.9.

2.1 Upgrade Planning

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

- Even if you already have a valid license from a previous version, you must still provide your credentials or a subscriptions manifest again upon upgrading to Ansible Tower 3.8. See Import a Subscription in the *Ansible Tower User Guide*.
- If you need to upgrade Red Hat Enterprise Linux and Ansible Tower, you will need to do a backup and restore of your Tower data. Refer to Upgrading an Existing Tower Installation in the *Ansible Automation Platform*

Installation and Reference Guide for further detail.

- Clustered upgrades require special attention to instance and instance groups prior to starting the upgrade. Refer to the Setting up the Inventory File and see Clustering for details.
- Prior versions of Ansible Tower used the variable name `rabbitmq_host` during installation. If you are upgrading from a previous version of Tower, and you previously specified `rabbitmq_host` in your inventory, simply rename `rabbitmq_host` to `routable_hostname` before upgrading. See Clustering for details.

2.2 Obtaining the Installer

Refer to Obtain the Ansible Automation Platform Installation Program in the *Ansible Automation Platform Installation and Reference Guide* for detail.

2.3 Setting up the Inventory File

As you edit your inventory file, there are a few things you must keep in mind:

- The contents of the inventory file should be defined in `./inventory`, next to the `./setup.sh` installer playbook.
- For **installations and upgrades**: If you need to make use of external databases, you must ensure the database sections of your inventory file are properly setup. Edit this file and add your external database information before running the setup script.
- For **Ansible Automation Platform** or **Automation Hub**: Be sure to add an automation hub host in the [automationhub] group (Tower and Automation Hub cannot be installed on the same node).
- Tower will not configure replication or failover for the database that it uses, although Tower should work with any replication that you have.
- The database server should be on the same network or in the same data center as the Tower server for performance reasons.
- For **upgrading an existing cluster**: When upgrading a cluster, you may decide that you want to also reconfigure your cluster to omit existing instances or instance groups. Omitting the instance or the instance group from the inventory file will not be enough to remove them from the cluster. In addition to omitting instances or instance groups from the inventory file, you must also deprovision instances or instance groups before starting the upgrade. Otherwise, omitted instances or instance groups will continue to communicate with the cluster, which can cause issues with tower services during the upgrade.
- For **clustered installations**: If you are creating a clustered setup, you must replace `localhost` with the hostname or IP address of all instances. All nodes/instances must be able to reach any others using this hostname or address. In other words, you cannot use the `localhost ansible_connection=local` on one of the nodes *AND* all of the nodes should use the same format for the host names.

  Therefore, this will *not* work:

```
[tower]
localhost ansible_connection=local
hostA
hostB.example.com
172.27.0.4
```

  Instead, use these formats:

```
[tower]
hostA
hostB
hostC
```

OR

```
hostA.example.com
hostB.example.com
hostC.example.com
```

OR

```
[tower]
172.27.0.2
172.27.0.3
172.27.0.4
```

- For **all standard installations**: When performing an installation, you must supply any necessary passwords in the inventory file.

Note: Changes made to the installation process now require that you fill out all of the password fields in the inventory file. If you need to know where to find the values for these they should be:

`admin_password=''` <— Tower local admin password

`pg_password=''` <—- Found in /etc/tower/conf.d/postgres.py

Warning: Do not use special characters in `pg_password` as it may cause the setup to fail.

2.3.1 Example Inventory files

- For **provisioning new nodes**: When provisioning new nodes add the nodes to the inventory file with all current nodes, make sure all passwords are included in the inventory file.
- For **upgrading a single node**: When upgrading, be sure to compare your inventory file to the current release version. It is recommended that you keep the passwords in here even when performing an upgrade.

Example Standalone Automation Hub Inventory File

```
[automationhub]
automationhub.acme.org
[all:vars]
automationhub_admin_password='<password>'
automationhub_pg_host=''
automationhub_pg_port=''
automationhub_pg_database='automationhub'
automationhub_pg_username='automationhub'
automationhub_pg_password='<password>'
automationhub_pg_sslmode='prefer'
# The default install will deploy a TLS enabled Automation Hub.
# If for some reason this is not the behavior wanted one can
```

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```
# disable TLS enabled deployment.
#
# automationhub_disable_https = False
# The default install will generate self-signed certificates for the Automation
# Hub service. If you are providing valid certificate via automationhub_ssl_cert
# and automationhub_ssl_key, one should toggle that value to True.
#
# automationhub_ssl_validate_certs = False
# SSL-related variables
# If set, this will install a custom CA certificate to the system trust store.
# custom_ca_cert=/path/to/ca.crt
# Certificate and key to install in Automation Hub node
# automationhub_ssl_cert=/path/to/automationhub.cert
# automationhub_ssl_key=/path/to/automationhub.key
```

Example Platform Inventory File

```
[tower]
tower.acme.org
[automationhub]
automationhub.acme.org
[database]
database-01.acme.org
[all:vars]
admin_password='<password>'
pg_host='database-01.acme.org'
pg_port='5432'
pg_database='awx'
pg_username='awx'
pg_password='<password>'
pg_sslmode='prefer'  # set to 'verify-full' for client-side enforced SSL
# Automation Hub Configuration
#
automationhub_admin_password='<password>'
automationhub_pg_host='database-01.acme.org'
automationhub_pg_port='5432'
automationhub_pg_database='automationhub'
automationhub_pg_username='automationhub'
automationhub_pg_password='<password>'
automationhub_pg_sslmode='prefer'
# The default install will deploy a TLS enabled Automation Hub.
# If for some reason this is not the behavior wanted one can
# disable TLS enabled deployment.
#
# automationhub_disable_https = False
# The default install will generate self-signed certificates for the Automation
# Hub service. If you are providing valid certificate via automationhub_ssl_cert
# and automationhub_ssl_key, one should toggle that value to True.
#
# automationhub_ssl_validate_certs = False
# Isolated Tower nodes automatically generate an RSA key for authentication;
# To disable this behavior, set this value to false
# isolated_key_generation=true
# SSL-related variables
# If set, this will install a custom CA certificate to the system trust store.
```

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```
# custom_ca_cert=/path/to/ca.crt
# Certificate and key to install in nginx for the web UI and API
# web_server_ssl_cert=/path/to/tower.cert
# web_server_ssl_key=/path/to/tower.key
# Certificate and key to install in Automation Hub node
# automationhub_ssl_cert=/path/to/automationhub.cert
# automationhub_ssl_key=/path/to/automationhub.key
# Server-side SSL settings for PostgreSQL (when we are installing it).
# postgres_use_ssl=False
# postgres_ssl_cert=/path/to/pgsql.crt
# postgres_ssl_key=/path/to/pgsql.key
```

Example Single Node Inventory File

```
[tower]
localhost ansible_connection=local

[database]

[all:vars]
admin_password='password'

pg_host=''
pg_port=''

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

Warning: Do not use special characters in `pg_password` as it may cause the setup to fail.

Example Multi Node Cluster Inventory File

```
[tower]
clusternode1.example.com
clusternode2.example.com
clusternode3.example.com

[database]
dbnode.example.com

[all:vars]
ansible_become=true

admin_password='password'

pg_host='dbnode.example.com'
pg_port='5432'

pg_database='tower'
pg_username='tower'
pg_password='password'
```

Warning: Do not use special characters in `pg_password` as it may cause the setup to fail.

Example Inventory file for an external existing database

```
[tower]
node.example.com ansible_connection=local

[database]

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


pg_host='database.example.com'
pg_port='5432'

pg_database='awx'
pg_username='awx'
```

Warning: Do not use special characters in `pg_password` as it may cause the setup to fail.

Example Inventory file for external database which needs installation

```
[tower]
node.example.com ansible_connection=local


[database]
database.example.com

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

pg_host='database.example.com'
pg_port='5432'

pg_database='awx'
pg_username='awx'
```

Warning: Do not use special characters in `pg_password` as it may cause the setup to fail.

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_user=root ansible_ssh_pass="your_password_here" inventory host or group variables
- ansible_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 (Only applies to Ansible 2.7)

The `DEFAULT_SUDO` Ansible configuration parameter was removed in Ansible 2.8, which causes the `ANSIBLE_SUDO=True ./setup.sh` method of privilege escalation to no longer work. For more information on `become` plugins, refer to Understanding Privilege Escalation and the list of become plugins.

2.4 Running the Setup Playbook

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:

- `-h` – Show this help message and exit
- `-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 (a default restore path is used unless EXTRA_VARS are provided with a non-default path, as shown in the code example below)

```
./setup.sh -e 'restore_backup_file=/path/to/nondefault/location' -r
```

CHAPTER

THREE

ROLE-BASED ACCESS CONTROLS

Ansible Tower 3.7 contains minor updates to the Role-Based Access Control (RBAC) system. For the latest RBAC documentation, refer to the Role-Based Access Controls section in the Tower User Guide.

3.1 Organization field on Job Templates

Job templates in Ansible Tower now include an organization field in the API. This is set on creation based on the organization of the project used by the Job Template, and cannot be changed. Because of this, a project's organization cannot be changed once it is in use by Job Templates.

This changes visibility and access to job templates. Previously, an admin of the organization that a job template's inventory belonged to would also be granted admin access to the job template. While existing permissions are preserved on an upgrade to Ansible Tower 3.7, newly created jobs will only grant view access to the job template to the inventory admin in this scenario.

CHAPTER

FOUR

USING VIRTUALENV WITH ANSIBLE TOWER

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. For more information on virtualenv, see the Python Guide to Virtual Environments and the *Python virtualenv* project itself.

By default, the virtualenv is located at `/var/lib/awx/venv/ansible` on the file system but you can create your own custom directories and use them in inventory imports. This allows you to choose how you run your inventory imports, as inventory sources use custom virtual environments.

Tower also pre-installs a variety of third-party library/SDK support into this virtualenv for its integration points with a variety of cloud providers (such as EC2, OpenStack, Azure, etc.) Periodically, you may want to add additional SDK support into this virtualenv, which is described in further detail below.

Note: It is highly recommended that you run `umask 0022` before installing any packages to the virtual environment. Failure to properly configure permissions can result in Tower service failures. An example follows:

```
# source /var/lib/awx/venv/ansible/bin/activate
# umask 0022
# pip install --upgrade pywinrm
# deactivate
```

In addition to adding modules to the virtualenv that Tower uses to run Ansible, you can create new virtualenvs as described below.

4.1 Preparing a new custom virtualenv

You can specify a different virtualenv for running Job Templates in Tower. In order to do so, you must specify which directories those venvs reside. You could choose to keep custom venvs inside `/var/lib/awx/venv/`, but it is highly recommended that a custom directory be created. The following examples use a placeholder directory `/opt/my-envs/`, but you can replace this with a directory path of your choice anywhere this is specified.

1. Preparing a new custom virtualenv requires the virtualenv package to be pre-installed:

```
$ sudo yum install python-virtualenv
```

2. Create a directory for your custom venvs:

```
$ sudo mkdir /opt/my-envs
```

3. Make sure to give your directory the appropriate write permission, execution permission and ownership:

```
$ sudo chmod 0755 /opt/my-envs
$ sudo chown awx:awx /opt/my-envs
```

4. Optionally, you can specify in Tower which directory to look for custom venvs by adding this directory to the `CUSTOM_VENV_PATHS` setting as follows:

```
$ curl -X PATCH 'https://user:password@tower.example.org/api/v2/settings/system/' \
    -d '{"CUSTOM_VENV_PATHS": ["/opt/my-envs/"]}'  -H 'Content-Type:application/json'
```

If you have venvs spanned over multiple directories, add all the paths and Tower will aggregate venvs from them:

```
$ curl -X PATCH 'https://user:password@tower.example.org/api/v2/settings/system/' \
    -d '{"CUSTOM_VENV_PATHS": ["/path/1/to/venv/", "/path/2/to/venv/", "/path/3/to/
↪venv/"]}' \
    -H 'Content-Type:application/json'
```

5. Now that a venv directory has been set up, create a virtual environment in that location:

```
$ sudo virtualenv /opt/my-envs/custom-venv
```

Note: Multiple versions of Python are supported, but the syntax for creating virtualenvs in Python 3 has changed slightly: `$ sudo python3 -m venv /opt/my-envs/custom-venv`

---

6. Next, install gcc so that `psutil` can be compiled:

```
$ yum install gcc
```

7. Python header files are needed to compile `psutil`. The package needed to successfully compile psutil on RHEL 8 systems is `platform-python-devel`:

```
$ yum install platform-python-devel
```

8. Your newly created virtualenv needs a few base dependencies to properly run playbooks (eg., fact gathering):

```
$ sudo /opt/my-envs/custom-venv/bin/pip install psutil
```

From here, you can install *additional* Python dependencies that you care about, such as a per-virtualenv version of Ansible itself:

```
$ sudo /opt/my-envs/custom-venv/bin/pip install -U "ansible == X.Y.Z"
```

Or you can add an additional third-party SDK that is not included with the base Tower installation:

```
$ sudo /opt/my-envs/custom-venv/bin/pip install -U python-digitalocean
```

If you want to copy them, the libraries included in Tower's default virtualenv can be found using `pip freeze`:

```
$ sudo /var/lib/awx/venv/ansible/bin/pip freeze
```

In a clustered Tower installation, you need to ensure that the same custom virtualenv exists on **every** local file system at `/opt/my-envs/`. Custom virtualenvs are supported on isolated instances. If you are using a custom virtual

environment, it needs to also be copied or replicated on any isolated node you would be using, not just on the Tower node. For setting up custom virtual environments in containers, refer to the OpenShift Deployment and Configuration section of the *Ansible Tower Administration Guide*.

4.2 Assigning custom virtualenvs

Once you have created a custom virtualenv, you can assign it at the Organization, Project, or Job Template level to use it in job runs. You can set the custom venv on an inventory source to run inventory updates in that venv. Jobs using that inventory follow their own rules and will not use this venv. If an SCM inventory source does not have a venv selected, it can use the venv of its linked project. You can assign a custom venv on the organization, but if you do, it will not be used by inventory updates in the organization, as it is only used in job runs.

The following shows the proper way to assign a custom venv at the desired level.

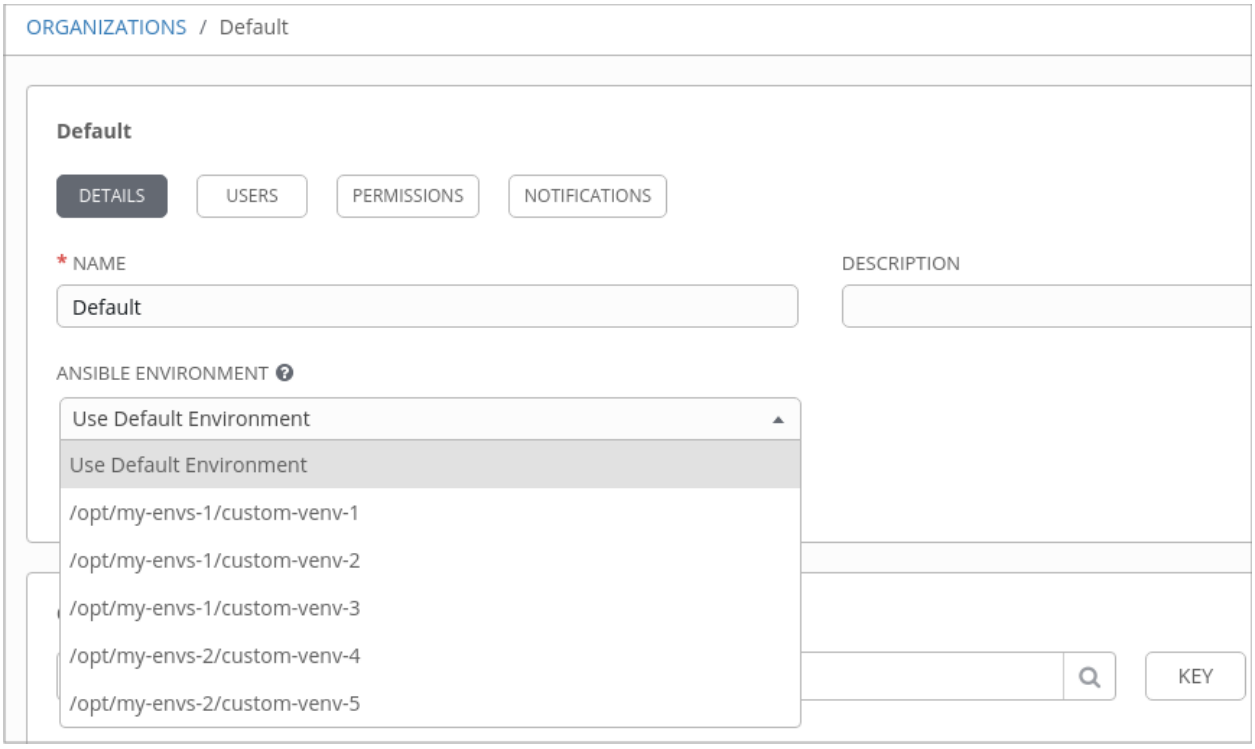
```
PATCH https://awx-host.example.org/api/v2/organizations/N/
PATCH https://awx-host.example.org/api/v2/projects/N/
PATCH https://awx-host.example.org/api/v2/job_templates/N/
PATCH https://awx-host.example.org/api/v2/inventory_sources/N/

Content-Type: application/json
{
        'custom_virtualenv': '/opt/my-envs/custom-venv'
}
```

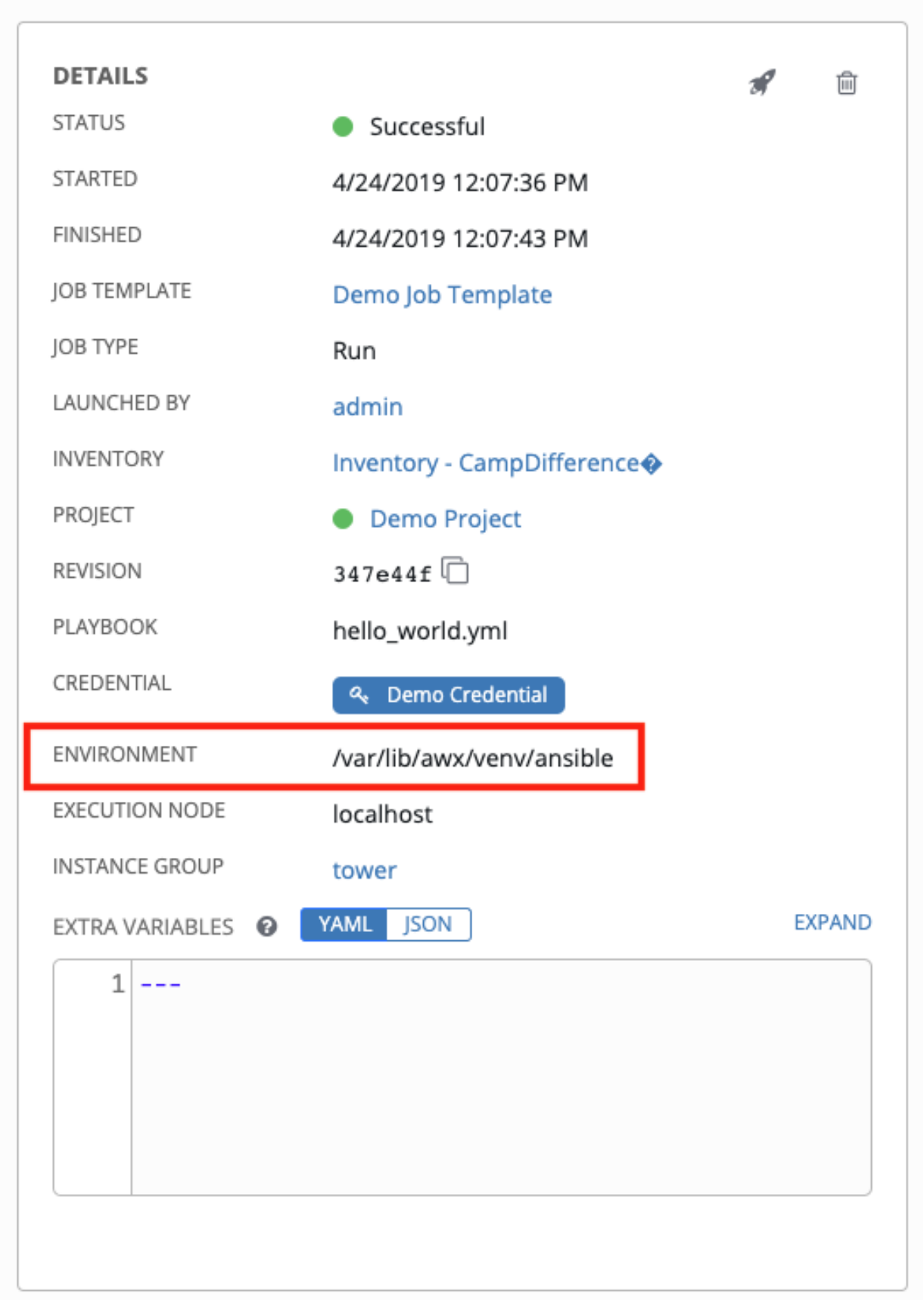
An HTTP GET request to `/api/v2/config/` provides a list of detected installed virtualenvs:

```
{
        "custom_virtualenvs": [
                "/opt/my-envs/custom-venv",
                "/opt/my-envs/my-other-custom-venv",
        ],
...
}
```

You can also specify the virtual environment to assign to an Organization, Project, and Job Template from their respective edit screens in the Ansible Tower User Interface. Select the virtualenv from the **Ansible Environment** drop-down menu, as shown in the example below:



When you launch a job template, you will also see the virtualenv specified in the Job Details pane:


DETAILS
STATUS
Successful
STARTED
4/24/2019 12:07:36 PM
FINISHED
4/24/2019 12:07:43 PM
JOB TEMPLATE
Demo Job Template
JOB TYPE
Run
LAUNCHED BY
admin
INVENTORY
Inventory - CampDifference
PROJECT
Demo Project
REVISION
347e44f
PLAYBOOK
hello_world.yml
CREDENTIAL
Demo Credential
ENVIRONMENT
/var/lib/awx/venv/ansible
EXECUTION NODE
localhost
INSTANCE GROUP
tower
EXTRA VARIABLES
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