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Overview

Tower

Ansible Tower is a web-based user interface and REST API endpoint for Ansible, the open source IT orchestration engine. Whether sharing operations tasks with your team or integrating with Ansible through the Tower REST API, Tower provides many powerful tools to make your automation life easier.

Realtime Playbook Output and Exploration

Watch playbooks run in real time, seeing each host as they check in. Easily go back and explore the results for specific tasks and hosts in great detail. Search for specific plays or hosts and see just those results, or quickly zero in on errors that need to be corrected.

"Push Button" Automation

Access your favorite projects and re-trigger execution from the web interface with a minimum of clicking. Tower will let you supply input variables, let you pick your credentials, will kick off and monitor the job, and allows you many views into the results and the history of your hosts over time.

Role Based Access Control and Auditing

Ansible Tower allows you to delegate specific authority to different teams or explicit users. Keep some projects private. Allow some users to edit inventory and others to run playbooks against only certain systems - either in dry run or live mode. Allow certain users to use credentials without exposing the credentials to them. Tower also records activity of operations made by users, including objects edited and jobs launched.
Cloud & Autoscaling Flexibility

Tower features a powerful provisioning callback feature that allows nodes to request configuration on demand. While optional, this is an ideal solution for a cloud auto-scaling scenario, integrating with provisioning servers like Cobbler, or when dealing with managed systems with unpredictable uptimes. Requiring no management software to be installed on remote nodes, the callback solution can be triggered via a simple call to 'curl' or 'wget', and is easily embeddable in init scripts, kickstarts, or preseeds. Access is controlled such that only machines in inventory can request configuration.

The Ideal RESTful API

The Tower REST API is the ideal RESTful API for a systems management application, with all resources fully discoverable, paginated, searchable, and well modeled. A styled API browser allows API exploration from the API root at [http://<Tower server name>/api](http://<Tower server name>/api), showing off every resource and relation. Everything that can be done in the user interface can be done in the API - and more.

Licensing

Tower is a proprietary software product and is licensed on an annual subscription basis. While Tower does require a license to run, there is no fee for managing up to 10 hosts. Additionally, trial licenses are available for exploring Tower with a larger number of hosts. Should you wish to acquire a license for additional servers or get support for the ones you have, please visit [http://www.ansible.com/pricing/](http://www.ansible.com/pricing/) for details or contact [http://support.ansible.com/](http://support.ansible.com/) for assistance. Trial licenses are available at [http://ansible.com/license](http://ansible.com/license).

Ansible is an open source software project and is licensed under the GNU General Public License version 3, as detailed in the Ansible source code: [https://github.com/ansible/ansible/blob/devel/COPYING](https://github.com/ansible/ansible/blob/devel/COPYING)

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Updates and Support

Tower is licensed as an annual subscription, which includes:

- Basic (Web-Only), Enterprise (8x5), or Premium (24x7) Support, available via web, email, and telephone with SLA
- All regular updates and releases of Tower and Ansible
For more information, please contact Ansible at http://support.ansible.com/ or at http://www.ansible.com/pricing/.

Requirements

Ansible Tower has the following minimum requirements:

- **Supported Operating Systems:**
  - Red Hat Enterprise Linux 6 64-bit
  - Red Hat Enterprise Linux 7 64-bit
  - CentOS 6 64-bit
  - CentOS 7 64-bit
  - Ubuntu 12.04 LTS 64-bit
  - Ubuntu 14.04 LTS 64-bit
- **Ansible (1.6.X or later)**
- **4 GB RAM**
- **20 GB hard disk**
- **For Amazon EC2:**
  - Instance size of m3.large or larger
  - An instance size of m3.xlarge or larger is suggested if there are more than 100 hosts

While other operating systems may technically function, currently only the above list is supported to host an Ansible Tower installation. If you have a firm requirement to run Tower on an unsupported operating system, please contact Ansible at http://support.ansible.com/. Management of other operating systems (nodes) is as documented by the Ansible project itself, and allows for a wider list.

Actual RAM requirements for will vary based on how many hosts Tower will manage simultaneously (which is controlled by the forks parameter in the job template or the system ansible.cfg file). To avoid possible resource conflicts, Ansible recommends 4GB of memory per 100 forks. For example, if forks is set to 100, 4GB of memory is recommended; if forks is set to 400, 16GB of memory is recommended.

A larger number of hosts can of course be addressed, though if the fork number is less than the total host count, more passes across the hosts will be required. These RAM limitations are avoided when using rolling updates or when using the provisioning callback system built into Tower, where each system requesting configuration enters a queue and is processed as quickly as possible; or in cases where Tower is producing or deploying images such as AMIs. All of these are great approaches to managing larger environments. For further questions, please contact http://support.ansible.com/.
The requirements for systems managed by Tower are the same as for Ansible at:
http://docs.ansible.com/intro_getting_started.html

Release Notes

- Version 2.0.4
  - Corrected a privilege escalation related to user account levels

- Version 2.0.2
  - Further corrections for job execution with certain 0mq library versions
  - Changes to AMI license logic to allow bring-your-own-license usage

- Version 2.0.1
  - Corrected a job execution issue due to 0mq library versions on certain platforms
  - Reduced logfile verbosity and retention for some Tower subcomponents
  - Adjusted setup playbook for the release of EPEL 7

- Version 2.0
  - New dashboard that provides at-a-glance status of your Ansible deployment
  - Completely redesigned job status page featuring real-time playbook output and progress updates
  - Added support for multiple new cloud providers - Azure, Google Compute Engine, and VMware vSphere
  - New user interface look and feel
  - Integrated monitoring support for checking the health of your Tower install
  - Tower now requires a license to run. 10 machine free licenses, as well as free large trial licenses, are available at http://ansible.com/license
  - Support added for Red Hat Enterprise Linux 7 and CentOS 7
• Upgrades will reuse password information, not requiring reentry in 'group_vars/all' of setup playbook
• Many assorted improvements and fixes

• Version 1.4.12
  • Corrected an issue handling Unicode output from ansible-playbook
  • Corrected an issue displaying job details for some jobs

• Version 1.4.11
  • Performance improvements to inventory import and deletion
    ▪ Groups UI under inventory tab is now paginated
    ▪ Updated UI options for moving and copying groups (and host contents)
  • Added the ability to optionally prompt for job variables when launching jobs to the job template detail pages

• Version 1.4.10
  • Correctly handle schedule creation when browser timezone cannot be detected.
  • Corrected pagination on job_events page.

• Version 1.4.9
  • Corrected a provisioning callback issue on Enterprise Linux.
  • Added a sample provisioning callback script.
  • Various backend and UI improvements.

• Version 1.4.8
  • Scheduling for Jobs, SCM updates, and Inventory synchronization has been added. The UI for each of these objects has changed to accommodate this new scheduling feature.
    ▪ The jobs page has been overhauled to show completed, active, queued, and scheduled jobs.
    ▪ Inventory and project synchronization jobs are now also shown on the jobs page.
  • Added support for Ansible Vault to Credentials. For more information on how to use Ansible Vault, please visit: http://docs.ansible.com/playbooks_vault.html.
Known Issues

1. Installation of Tower through an HTTP proxy requires setting the environment variable "HTTP_PROXY" accordingly, before running `setup.sh`.

2. Ansible Tower implements a role based access control system. You may appear to be able to edit objects that do not belong to you (like being able to pull up an edit dialog on your team mates whom you already have permission to view). Don't worry, when you try to edit something, you'll get a 403 error, and you can't see any information you shouldn't already have access to as defined in the system.

3. If a job template is deleted while jobs that depend on it are running, the system may be left in a somewhat indeterminate state with some queued jobs remaining in the list. Simply delete these queued jobs via the delete button in the jobs view.

4. On Red Hat Enterprise Linux 7 and CentOS 7, you will need to either disable the `firewalld` service (if active), or modify the `firewalld` configuration to allow incoming connections on port 80, 443, and 8080.
Getting Started

Welcome to Ansible Tower!

To get started, first follow the installation instructions in the section entitled Installation and Setup. Then, either walk through the quick start below to quickly get up and running with Tower or browse through the documentation and design an implementation plan that works for you.

We value your feedback. Please contact us at http://support.ansible.com/ and let us know what you think and your ideas for future features!

Installation and Setup

You can expect the installation of Tower to take less than fifteen minutes, depending on the speed of your network connection. (This installation will require that the Tower server be able to access the Internet.) At the end of the installation, you will use your web browser to access Tower and utilize all of its capabilities.

Tower is a full application and the installation process installs several dependencies such as PostgreSQL, RabbitMQ, Apache, and others. We recommend that you install Tower on a standalone VM or cloud instance and do not co-locate any other applications on that machine. Although Tower and Ansible are written in Python, they are not just simple Python libraries. Therefore Tower cannot be installed in a Python virtualenv, a Docker container, or any similar subsystem; you must install it as described in the installation instructions below.

1. Install Ansible

Use 1.6.x or later as detailed in the Ansible documentation at:

http://docs.ansible.com/intro_installation.html

Ansible strongly recommends using Ansible 1.7.1 or later; this should be available in your distribution's repository.

For convenience, we'll summarize those installation instructions here:
For Red Hat Enterprise Linux and CentOS (version 6 or later):

Configure the EPEL repository and any additional repositories.

- For Red Hat Enterprise Linux 6 and CentOS 6:

  ```
  root@localhost:~$ yum install \n  http://download.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-8.noarch.rpm
  ```

- For Red Hat Enterprise Linux 7 and CentOS 7

  ```
  root@localhost:~$ yum install \n  http://download.fedoraproject.org/pub/epel/7/x86_64/e/epel-release-7-1.noarch.rpm
  ```

**NOTE:** You may also need to enable the "extras" repository. This is named "extras" on CentOS 7, "rhel-server-extras" on Red Hat Enterprise Linux 7, and "rhui-REGION-rhel-server-extras" when running in EC2.

**NOTE:** For users of Red Hat Enterprise Linux 7, you also need to enable the "optional" repository. When using the official Red Hat Enterprise Linux 7 marketplace AMI, be sure you install the latest "rh-amazon-rhui-client" package that allows enabling the optional repo (named "rhui-REGION-rhel-server-optional" in EC2).

**NOTE:** For users of Red Hat Enterprise Linux 7 or CentOS 7, you will need to either disable the 'firewalld' service (if active), or modify the firewalld configuration to allow incoming connections on ports 80, 443, and 8080. This will be fixed in a future release.

- Install Ansible

  ```
  root@localhost:~$ yum install ansible
  ```
For Ubuntu 12.04 and Ubuntu 14.04:

- Configure Ansible PPA

```bash
root@localhost:~$ apt-get install software-properties-common
root@localhost:~$ apt-add-repository ppa:ansible/ansible
```

- Install Ansible

```bash
root@localhost:~$ apt-get update
root@localhost:~$ apt-get install ansible
```

2. Download Tower:

Download Ansible Tower by filling out the form at http://www.ansible.com/tower. After completing the form, you will receive an email containing the link to the Tower installation tarball, and an email containing your license information.

3. Extract the tarball

Then `cd` into the setup directory. Replace the string `VERSION` in the commands below with the version of Tower that you are installing e.g., "2.0.2".

```bash
root@localhost:~$ tar xvzf ansible-tower-setup-latest.tar.gz
root@localhost:~$ cd ansible-tower-setup-VERSION
```

4. Change the default passwords

Edit the file `group_vars/all`. In this file, you want to set the following values:

- `pg_password`

This changes the default database password.
• **admin_password**

This is the password for 'admin', the first user (and superuser) created on installation. You'll need this password for your initial login to Tower.

• **munin_password**

This password is used by Tower superusers to access the Munin-based monitoring of your Tower server.

• **rabbitmq_password**

This password is used for the RabbitMQ server that is used internally by Tower. This should be changed from the default, but it is not required from users during runtime.

### 5. Run the installation script

From the ansible-tower-setup-VERSION directory, run `setup.sh`

---

**NOTE:** For users of Red Hat Enterprise Linux or CentOS, PackageKit can frequently interfere with the update mechanism. Consider disabling or removing PackageKit if installed prior to running the setup process.

**NOTE:** For users of Red Hat Enterprise Linux or CentOS systems, SELinux can be set to disabled, permissive, or enforcing, but is only supported in "targeted" mode.

**NOTE:** Installation of Tower through an HTTP proxy requires setting the environment variable "HTTP_PROXY" accordingly, before running `setup.sh`.
Setup will install Tower from RPM or Deb packages using repositories hosted on ansible.com.

When setup completes successfully, you should be able to point your web browser to the Tower server and see the Tower login screen.

If the installation of Tower fails or if you need assistance, please contact us at http://support.ansible.com/. Ansible subscription customers will receive a faster response by filing a support issue.

6. Configure LDAP / Active Directory (optional)

If you wish to setup LDAP / Active Directory authentication for Tower, please review the section Using LDAP with Tower.

Upgrade an Existing Tower Installation

You can upgrade your existing Tower installation to the latest version by running the setup playbook for the new version of Tower. All data will be preserved.
As with installation, the upgrade process requires that the Tower server be able to access the Internet. The upgrade process will take roughly the same amount of time as a Tower install, plus any time needed for data migration.

This upgrade procedure assumes that you have a working installation of Ansible and Tower.

1. Stop the current Ansible Tower service.

For Ansible Tower 1.4.x and earlier:

```
root@localhost:~$ supervisorctl stop all
```

For Ansible Tower 2.0 and later:

```
root@localhost:~$ service ansible-tower stop
```

2. Download Tower


3. Extract the tarball

Then `cd` into the setup directory. Replace the string `VERSION` in the commands below with the version of Tower that you are installing e.g., "2.0.2".

```
root@localhost:~$ tar xvzf ansible-tower-setup-latest.tar.gz
root@localhost:~$ cd ansible-tower-setup-VERSION
```
4. Run the installation script

From the ansible-tower-setup-VERSION directory, run `setup.sh`

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

Setup will upgrade Ansible from RPM or Deb packages using repositories hosted on Ansible.com.

When setup completes successfully, you should be able to point your web browser to the Tower server and see the Tower login screen.

```
NOTE: For users of Red Hat Enterprise Linux or CentOS, PackageKit can frequently interfere with the update mechanism. Consider disabling or removing PackageKit if installed prior to running the setup process.
```

```
NOTE: Installation of Tower through an HTTP proxy requires setting the environment variable "HTTP_PROXY" accordingly, before running `setup.sh`.
```

```
NOTE: As part of the upgrade process, database schema migration may be done. Depending on the size of your Tower installation, this may take some time.
```

If the upgrade of Tower fails or if you need assistance, please contact us at http://support.ansible.com/. Ansible subscription customers will receive a faster response by filing a support issue.

Quick Start

After the installation of Tower is complete, we'll complete the following tasks to quickly set up and launch our first Ansible playbook using Tower. This first playbook launch will execute simple Ansible tasks to teach you how to use Tower and also ensure Tower is setup properly.
Here's a summary of the tasks we'll need to accomplish:

1. Login as a Superuser
2. Import a License
3. Examine the Tower Dashboard
4. Configure Live Events
5. Create an Organization
6. Add a new User to the Organization
7. Add an Inventory to the Organization
8. Create a Credential
9. Create a Project
10. Create a new Job Template
11. Launch it!

You can expect the Quick Start to take less than thirty minutes, from beginning to end. At the end of the Quick Start, you'll have a functioning Tower that you can use to launch more sophisticated playbooks.

For the Quick Start, you will need to have completed the Tower installation and you will also need a target system to deploy the playbook to. This can be any sort of system that can be managed by Ansible, as described at http://docs.ansible.com/intro_installation.html.

Ready? Let's go!

1. Login as a Superuser

First, log in to Tower by browsing to the Tower server URL at [http://<Tower server name>/](http://<Tower server name>/)

Log in using the username and password set during the installation process. By default, this will be username: "admin" and password: "password". You can change this by clicking on the "admin" account on the users tab.

---

**NOTE:** We'll get into the details of the differences between a normal user, superuser, and organization administrator in the section Users.
2. Import a License

Tower requires a valid license to run. When you entered your information to download Tower, you should have received an e-mail that contains your license; you may also have received a license direct from Ansible. If you did not receive a license, or have issues with the license you received, please visit http://ansible.com/license to see our free and paid license options (including free trial licenses) or contact Ansible Support at http://support.ansible.com/.

When you start up Tower without a valid license, you'll see the following dialog.
Paste in the license you received from Ansible, and click 'Submit'. Your license should be accepted, and you can continue to the main Ansible interface.
This license screen can be viewed later from the 'View License' dropdown of the Tower user's menu on the top right screen.

**NOTE:** Only a superuser can update the license.

**NOTE:** You can also save the license file to /etc/awx/license on the Tower server.
3. Examine the Tower Dashboard

We are now at the Tower Dashboard. On this screen, we can see a summary of your current **Hosts**, **Inventories**, and **Projects**. There is a time-based graph of job status, a summary chart of host status, a summary of both recently completed jobs and scheduled jobs, and for superusers, a summary of the host count.

Across the top of this interface, we have navigation to access all aspects of Tower, including **Organizations**, **Users**, **Teams**, **Credentials**, **Projects**, **Inventories**, **Job Templates**, and **Jobs**.

Keep in mind that the goal of this Quick Start is to launch a simple playbook. In order to do so, we'll need to set up a number of configuration options, but doing so now will ensure Tower is configured properly and allow us to easily execute more involved playbooks later while taking advantage of all the flexible role-based access control that Tower provides. You'll also get to know more about Tower along the way.

Tower provides multiple levels of role-based access, providing delegation of responsibility, but with fine-grained control over who can do what. We'll talk about that in more detail later in this document. For now, here's a simplified outline that shows the hierarchy of Tower's role based access control and the relationship between each element.
Tower Hierarchy

- Organization
  - Inventories
    - Groups
      - Hosts
  - Teams
    - Credentials
    - Permissions
    - Users
      - Credentials
      - Permissions
- Projects
  - Playbooks
  - Job Templates
- Jobs
4. Configure Live Events

In the Tower menu you will see a colored dot next to the Tower User's menu. This dot shows the status of Tower’s *Live Events* functionality.
If this dot is green, all is well. If this dot is red or orange, Live Events are not working. In this case, click the dot to bring up the Live Events troubleshooting wizard. Follow the instructions there to configure Live Events.

If Live Events is not working, many pages will have a button, which can be used to refresh their contents.

Now, let's create a new organization within which we can create our first user, detail our inventory of hosts, and store SSH credentials for those hosts.

5. Create an Organization

Click on the Organizations tab. An Organization is a logical collection of Users, Teams, Projects, and Inventories. It is the highest level object in the Tower object hierarchy.
Then click the + button.

Enter a simple name and description for the organization. You can edit both of these fields later, so the values aren't critical. For our example, we will create an organization for a fictitious company called Bender Products Ltd. Click the Save button to save the organization.

Organizations have both normal users and organization administrators. Organization Administrators are able to modify the membership and other properties of the organization, whereas normal users cannot. They are essentially superusers but only within the scope of that organization. For more about the differences between users and administrators, see the section on Users.

The "admin" user is a Superuser account -- a de-facto administrator for all organizations, so let's use our admin powers to create a new user and add it to our new organization. When creating a new user, the checkbox Superuser? corresponds to this level of access. Only Superusers can create other Superusers or promote existing users to this level.
6. Create a new User and add the user to the Organization

Expand the **Users** section (not the Users tab!) as shown here:

Add a user by clicking the **+** button.
A list of all existing users will be presented. Since we have not created any users, the only user listed is "admin". Click the button to create a brand new user.

Enter the user's details.

- **First Name**: Jane
- **Last Name**: Doe
- **Email**: jdoe@example.com
- **Organization**: Bender Products Ltd
- **Username**: jdoe
- **Password**: ********

Confirm Password: ********

- **Superuser (User has full system administration privileges)**

[Save][Reset]
Click the **Save** button to save the user. You will be taken back to the organization details, where the new user we just created now appears on the list.

Now, we have an organization and a user. Let's add an inventory of hosts we'll be managing for Bender Products.

### 7. Create a new Inventory and add it to the Organization

An inventory is a collection of hosts that can be managed with Tower. Inventories are assigned to organizations and permission to launch playbooks against inventories is controlled at the user and team level. More information can be found in the [Inventories](#) and [Permissions](#) sections.

Create a new inventory by browsing to the **Inventories** tab and clicking the **+** button.
Enter the values for **Name** and **Description**. For this example, the name of our inventory will be Web Servers. Then click the search button to the left of the **Organization** field to select the organization that this inventory should belong to.
For this example we'll use the organization we created earlier. Select the row from the list by clicking on it. The selected row will be highlighted. Click the **Select** button to confirm your choice.
We will discuss variables in more detail later. For now, leave the Variables field alone. Click the Save button at the bottom of the page to create the inventory.

After clicking Save, you will see the Inventories screen for the Web Servers inventory.

Inventories are divided into groups and groups contain hosts. A group might represent a particular environment (e.g. "Datacenter 1" or "Stage Testing"), a type of server (e.g. "Application Servers" or "DB Servers"), or any representation of your environment.

The left/top side of the screen displays the groups that belong to the Web Servers inventory. The groups list is empty at this point. The right/bottom side displays hosts.
Hosts are added to groups. They cannot be added directly to the inventory root. So to begin adding hosts to the Web Servers inventory, we first need to add a group. Click the + button.

Bender Products has a group of web server hosts supporting the corporate CMS application. To add these hosts to the Web Servers inventory we'll create a "CMS Web" group. Again, we will defer a discussion of variables for later. Click the Save button to create the group.
Finally, we’ll add a host to the group.

Select + to create the new host and add it to the group.

Enter the Host Name, which should either be the DNS resolvable name of the host or its IP address. This is how Tower will contact the host, so the host must be reachable using this hostname or IP address for Tower to function properly. The Description is arbitrary, as usual. (Note, experienced Ansible users will know they could also set the ansible_ssh_host environment variable to use an alias, but that is not going to be covered here).

For the purposes of this Quick Start, add a host that you can actually reach via SSH and manage using Ansible (i.e. that meets the Ansible requirements (http://docs.ansible.com/intro_installation.html)). We will launch a simple Ansible playbook that will not harm or modify the target in any way. Using a real target host allows us to ensure that Tower is setup properly.
Click **Save** to finish adding the host.

Next, we'll add credentials to our new user that Tower can use to access and launch Ansible playbooks for the host in our inventory.
8. Create a new Credential

Credentials are used to authenticate the Tower user to launch Ansible playbooks against inventory hosts and can include passwords and SSH keys. You can also require the Tower user to enter a password or key phrase when a playbook is launched using the credentials feature of Tower.

Create a new credential by browsing to the Credentials tab. Click + to create a new credential.

Enter an arbitrary **Name** and **Description** for this credential. Either an individual user or a team may own credentials. Let's associate this credential with the user we created in step #3. Select the "User" radio button.

Then, select the **search** button to find the user that we created in step #3.
Find and select the "jdoe" user.

Next, select credential type Machine.
Now, we'll enter the details of the appropriate authentication mechanism to use for the host we added to Tower in step #3. Use the actual credentials for the real host. To keep things simple, we'll use an SSH password, but ask for it at runtime. So, rather than enter the password here, we'll enter it later when we launch a playbook using these credentials. To do so, check the box Ask at runtime for SSH Password, as shown here.

Tower supports various different options for what you want to store for credentials in this box. Uploading a locked SSH key is recommended, and Tower can prompt you for the SSH unlock password for use with ssh-agent when launching the job.

Tower encrypts passwords and key information in the Tower database and never makes secret information visible via the API.
Now, we'll create a new project and a job template with which to launch a simple playbook.

9. Create a new Project

Before we create this project, we'll need to create a subdirectory for it on the Tower server filesystem, where we will store the Ansible playbooks for this project.

NOTE: This will require you to log into the Tower server on the command line console. In a future version of Tower, this will be done without leaving the Web interface.

Create a new project directory by creating a directory on the Tower filesystem underneath the Project Base Path, by default "/var/lib/awx/projects".

```
root@localhost:~$ cd /var/lib/awx/projects
root@localhost:~$ mkdir helloworld
```

While we're here, let's go ahead and create a simple Ansible playbook. Use your favorite editor to create a file called "helloworld.yml" inside the directory we just created, "/var/lib/awx/projects".

```
root@localhost:~$ cd helloworld
root@localhost:~$ vi helloworld.yml
```

The contents of the file are below:
- name: Hello World!
  hosts: all
  user: root

  tasks:
  - name: Hello World!
    shell: echo "Hi! Tower is working"

Note the user: root line. If you need to log into the target machine as another user, for instance, "ubuntu", change that here. Also note the indentation - it is important. Save this playbook file and we'll use it to test Tower running a playbook against the host in our inventory.

**NOTE:** Ansible playbooks utilize the YAML language. More information about Ansible playbooks may be found at [http://docs.ansible.com/playbooks.html](http://docs.ansible.com/playbooks.html). More information on YAML can be found at [http://docs.ansible.com/YAMLSyntax.html](http://docs.ansible.com/YAMLSyntax.html) and [http://yaml.org/](http://yaml.org/).

Now, create the new project by browsing to the **Projects** tab. Click the **+** button.

Enter a **Name** and **Description** for the project.

The **Project Base Path** will display the value entered when Tower was installed and cannot be edited from this dialog. (See the section **Administration of Tower** for more information on how to modify this value.) Leave **SCM Type** set to Manual, for now.
For the **Playbook Directory** select a value that corresponds to the subdirectory we just created.

If you see the following warning:

"**WARNING:** There are no unassigned playbook directories in the base project path /var/lib/awx/projects. Either the projects directory is empty, or all of the contents are already assigned to other projects. New projects can be checked out from source control by changing the SCM type option rather than specifying checkout paths manually. To continue with manual setup, log into the Tower server and ensure content is present in a subdirectory under /var/lib/awx/projects. Run "chown -R awx" on the content directory to ensure awx can read the playbooks."

Double check that the **helloworld** project directory and file were created correctly and that the permissions are correct. Use **chown -R awx** on the project directory if necessary. If SE Linux is enabled, check the directory and file context.
Select **Save** and the new project will be displayed.

Finally, let's create a job template for this new playbook and launch it.

### 10. Create a new Job Template

A job template combines an Ansible playbook from a project and the settings required to launch it. Create a new job template by browsing to the **Job Templates** tab and clicking the **+** button.

Enter values for the **Name** and **Description**. Jobs can be of type **Run** or **Check**. Select **Run** for this Quick Start (check corresponds to "dry run" mode.) Choose the **Inventory**, **Project**, and **Credential** from those we have created during this exercise. The playbook drop-down menu will automatically populate from the project path and playbook we created in step #5. Choose the "helloworld" playbook.

You can leave the other values, such as **Forks** and **Job Tags** set to their default values or blank. They'll be covered later under **Job Templates**.
Click Save.

Now, let's launch the playbook and watch it all come together.
11. Launch it!

To launch the playbook, browse to the **Job Templates** tab and click **Launch** on the template.

Tower will ask you for the SSH password, as we configured the credential.
Tower will then redirect the browser to the status page for this job under **Jobs** tab, where you can watch this job as it runs.
This page will automatically refresh using Tower's Live Event feature until the job is complete.
When the job has finished, click the button to view the standard output for the job.

```
When the job has finished, click the button to view the standard output for the job.
```

```
When the job has finished, click the button to view the standard output for the job.
```
You can also drill down into individual tasks. Select the `webserver` host under `Summary`, to see job events for that host:
This screen will show us all of the events that resulted from running our playbook.
To show the event details, click on a particular event in the list:
Now, click Results:

Great work! Your Tower installation is up and running properly. Now, you can browse through the User Guide and learn about all of these features of Tower in more detail.

Don't hesitate to send your feedback to http://support.ansible.com/. We appreciate your support!
This section of the documentation will detail all of the functionality of Tower.

Ansible

This user guide assumes moderate familiarity with Ansible, including concepts such as Playbooks, Variables, and Tags. For more information on these and other Ansible concepts, please see the Ansible documentation at http://docs.ansible.com/.

Logging In

To log in to Tower, browse to the Tower interface at http://<Tower server name>/.

Log in using a valid Tower username and password.
Main Menu

The top menu of Ansible provides quick links to the main aspects of Tower - **Organizations, Users, Teams, Credentials, Projects, Inventories, Job Templates, Jobs**. Each of these will be described in more detail below.

Clicking on the Ansible Tower logo at any time returns you to the Dashboard. There is also a status icon that displays the status of Tower Live Events, and the Tower User menu.

NOTE: The default username and password set during installation are "admin" and "password", but the Tower administrator may have changed these settings during installation. If the default settings have not been changed, you can do so from the Users tab.
Live Events

Most pages in Tower, such as listing pages, or the job status, will automatically update as events happen, via Tower's **Live Events** feature. The status of Live Events is shown by a colored dot next to the Tower User's menu. This dot shows the status of Tower's **Live Events** functionality.

[Image of Live Events feature in Tower]

Copyright 2014 Ansible, Inc.
If this dot is green, all is well. If this dot is red or orange, Live Events are not available. Live Events are implemented by a "WebSocket" connection over HTTPS on port 8080. The most common cause of Live Events failures is the need to accept the certificate by visiting the web server via https:// on port 8080. If Live Events are not available because the red dot is displayed, click the dot to bring up the Live Events troubleshooting wizard. Follow the instructions there to configure Live Events.

If Live Events are not available, many pages will have a button, which can be used to refresh their contents.

**Tower User Menu**

The Tower User menu allows the Tower User to:

- See some basic information in **About Tower**
- Change the user's information in **Account Settings**
- **View License** to view (and for Superusers, update) the Tower license
- Search the Ansible KnowledgeBase and file any issues via **Contact Support**
- Check on the health of their Tower install via **Monitor Tower**
- **Logout**
Dashboard

The central interface to Tower is the Dashboard.

In the upper right corner of the Dashboard is the button, which can be used to view the activity stream of all actions for the Tower installation. Most pages in Tower allow viewing an activity stream filtered for that specific object.

At the top of the Dashboard is a summary of your hosts, inventories, and projects. Each of these is linked to the corresponding object in Tower, for easy access.

The Dashboard contains four graphs.

Job Status

The Job Status graph displays the number of successful and failed jobs over a specified time period. You can choose to limit the job types that are viewed, and to change the time horizon of the graph.
Host Status

The Host Status graph displays, as of the most recent job run, how many of the configured hosts in your inventory have been marked as 'Successful'.

Job and Schedule Status

The Jobs tab of this display shows a summary of the most recently completed jobs. It is the same summary you will see if you click on the Jobs entry in the menu.

The Schedule tab of this display shows upcoming scheduled jobs. It is the same summary you will see if you click on the Jobs entry in the menu and look at the Scheduled table.

Host Count

The Host Count graph shows the number of managed hosts, over time. It can be used to determine whether your Tower installation is coming close to its license capacity. This graph is only shown to Superusers.

Activity Streams

Most screens in Tower have an button. Clicking this brings up the Activity Stream for this object.
An Activity Stream shows all changes for a particular object. For each change, the Activity Stream shows the time of the event, the user that initiated the event, and the action. Clicking on the button shows the event log for the change.

The Activity Stream can be filtered by the initiating user (or the system, if it was system initiated), and by any related Tower object, such as a particular credential, job template, or schedule.

The Activity Stream on the Dashboard shows the Activity Stream for the entire Tower instance.

Organizations

An organization is a logical collection of Users, Teams, Projects, and Inventories and is the highest level in the Tower object hierarchy.

The Organizations tab displays all of the existing organizations for your installation of Tower. Organizations can be searched by Name or Description. Modify and remove organizations using the Edit and Delete buttons.

Buttons located in the upper right corner of the Organizations tab provide the following actions:

- Create a new organization
- View Activity Stream

Create a new organization by selecting the button.

1. Enter the Name for your organization.
2. Optionally, enter a Description for the organization.
Click **Save** to finish creating the organization.

Once created, Tower will display the organization details, including two accordion-style menus below the organization name and description details that provide for managing users and administrators for the organization.
Organizations - Users

The Users menu of an Organization displays all the Users associated with this organization. A user is someone with access to Tower with associated permissions and credentials. Expand the users menu by selecting Users.

This menu allows you to manage the user membership for this organization. (User membership may also be managed on a per-user basis via the Users tab.) The user list may be sorted and searched by Username, First Name, or Last Name. Existing users may also be modified and removed using the Edit and Delete buttons. Click on a user to bring up that user’s details, which can then be edited. For more information, please see the section Users.

To add existing users to the organization, click the button. Then, select one or more users from the list of available users by clicking the Select checkbox or clicking anywhere on the user row. Click the Select button when done.
To create a new user and add it to the organization, click the button from the Add Users screen, which takes us to the new user dialog.

Enter the appropriate details into the following fields:

- First Name
- Last Name
- Email
- Organization (will be prefilled with the current Organization)
- Username
- Password
- Confirm Password
- Superuser? (Give this user Superuser privileges for Tower. Caution!)

All of these fields are required. Select Save when finished and the user will be added to the organization.
Organization - Administrators

An organization administrator is a type of user that has the rights to create, modify, or delete objects in the organization, including projects, teams, and users in that organization. Expand the Administrators menu by selecting Administrators.

This menu displays a list of the users that are currently an organization administrator of the organization. The administrator list may be sorted and searched by Username, First Name, or Last Name. Note that any user marked as a ‘Superuser’ is implicitly an administrator of all organizations, and is not displayed here.

To add an administrator to the organization, click the button.

Then, select one or more users from the list of available users by clicking the Select checkbox or clicking anywhere on the user row. Click the Select button when done.
Users

A user is someone who has access to Tower with associated permissions and credentials. The Users tab allows you to manage all Tower users. The user list may be sorted and searched by **Username**, **First Name**, or **Last Name**.

There are three types of Tower Users:

1. **Normal User**: read and write access is limited to the inventory and projects that the user has been granted the appropriate rights to.

2. **Organization Administrator**: the administrator of an organization has all of the rights of a normal user, as well as admin, read, and write permission over the entire organization and all of its inventories and projects, but does not have those levels of access on content belonging to other organizations. This level of user can create and manage users.

3. **Superuser**: a Tower Superuser has admin, read, and write permissions over the entire Tower installation. A Superuser is typically a systems administrator responsible for managing Tower and will delegate responsibilities for day-to-day work to various Organization Administrators.

**NOTE**: A user must first be added to the Organization before it can be added to the list of Administrators for that Organization.
To create a new user click the button, which takes us to the new user dialog.

Enter the appropriate details into the following fields:

- First Name
- Last Name
- Email
- Organization (Choose from an existing organization)
- Username
- Password
- Confirm Password

**NOTE:** The initial user (usually "admin") created by the Tower installation process is a Superuser. One Superuser must always exist, so if you wish to delete "admin", first create another Superuser account.
• Superuser? (Gives this user admin privileges for Tower. Caution!)

All of these fields are required. Select Save when finished.

Once the user is successfully created, Tower will open the Edit User dialog. This is the same menu that is opened if the Edit button is clicked from the Users tab. Here, User Setting, Credentials, Permissions, and other user membership details may be reviewed and modified.

Users - Credentials

Credentials are utilized by Tower for authenticating when launching jobs against machines, to synchronize with inventory sources, and to import project content from version control systems. For details about how to use credentials, please see the section Credentials.
To add a credential to user, expand the credentials menu and click the button.

Then, select one or more credentials from the list of available credentials by clicking the Select checkbox. Click the Select button when done.
To create a new credential and add it to the user, click the + button from the Add Credentials screen, which takes us to the Create Credential dialog.

Enter the appropriate details depending on the type of credential and select Save. (For details about credential types, please see the section Credentials.)

**Users - Permissions**

Permissions are the set of privileges assigned to users and teams that provide the ability to read, modify, and administer projects, inventories, and other Tower elements.

There are two permission types available to be assigned to users and teams, each with its own set of permissions available to be assigned:

- **Inventory**: grants permission to act on inventories, groups, and hosts
  - **Admin**: modify the settings for the specified inventory. This permission also grants Read and Write permissions.
  - **Read**: view groups and hosts within a specified inventory
  - **Write**: create, modify, and remove groups, and hosts within a specified inventory. Does not give permission to modify the inventory settings. This permission also grants the Read permission.
- **Deployment**: grants permission to launch jobs from the specified project against the specified inventory
  - **Run**: launch jobs of type Run. This permission also grants the Check permission.
Check: launch jobs of type Check.

This menu displays a list of the permissions that are currently available. The permissions list may be sorted and searched by Name, Inventory, Project or Permission type.

To add new permissions to the user, click the button, which takes us to the Add Permission dialog.

Enter the appropriate details into the following fields:

- Permission Type
Selecting a Permission Type of either Inventory or Deployment will change the appearance of the Add Permission dialog to present appropriate options for each type of permission.

For a permission of type Inventory, enter the following details:

- Inventory (Select from the available inventories)
- Permission
  - Admin
  - Read
  - Write

For a permission of type Deployment, enter the following details:

- Project (Select from the available projects)
- Inventory (Select from the available inventories)
- Permission
  - Run
  - Check

Select Save.
Users - Admin of Organizations

This displays the list of organizations that this user is an administrator of. This list may be searched by Organization Name or Description. A user cannot be made an organization administrator from this interface panel.

Users - Organizations

This displays the list of organizations that this user is a member of. This list may be searched by Organization Name or Description. Organization membership cannot be modified from this display panel.
Users - Teams

This displays the list of teams that this user is a member of. This list may be searched by **Team Name** or **Description**. Team membership cannot be modified from this display panel. For more information, see the Teams section.

Teams

A team is a subdivision of an organization with associated users, projects, credentials, and permissions. Teams provide a means to implement role-based access control schemes and delegate responsibilities across organizations. For instance, permissions may be granted to a whole team rather than each user on the team.

This tab allows you to manage the teams for Tower. The team list may be sorted and searched by **Name**, **Description**, or **Organization**.

Buttons located in the upper right corner of the Teams tab provide the following actions:

- Create a new team
- View Activity Stream

To create a new team, click the button.

Enter the appropriate details into the following fields:

- Name
- Description
- Organization (Choose from an existing organization)

All fields are required. Select **Save**.

Once the team is successfully created, Tower will open the **Edit Team** dialog. This is the same menu that is opened if the **Edit** button is clicked from the **Teams** tab. Here, **Team Settings**, **Credentials**, **Permissions**, **Projects**, and **Users** associated with this team may be reviewed and modified.
Teams - Credentials

Credentials are utilized by Tower for authenticating when launching jobs against machines, to synchronize with inventory sources, and to import project content from a version control system. For details about how to use credentials, please see the section Credentials.

To add credentials to the team, click the button. Then, select one or more credentials from the list of available credentials by clicking the Select checkbox. Click the Select button when done.
To create new credentials and add them to the team, click the button from the Add Credentials screen.

Enter the appropriate details depending on the type of credential and select Save. (For details about credential types, please see the section Credentials.)

Teams - Permissions

Permissions are the set of privileges assigned to users and teams that provide the ability to read, modify, and administer projects, inventories, and other Tower elements.

There are two permission types available to be assigned to users and teams, each with its own set of permissions available to be assigned:

- **Inventory**: grants permission to act on inventories, groups, and hosts
  - Admin: modify the settings for the specified inventory. This permission also grants Read and Write permissions.
  - Read: view groups and hosts within a specified inventory
  - Write: create, modify, and remove groups, and hosts within a specified inventory. Does not give permission to modify the inventory settings. This permission also grants the Read permission.
- **Deployment**: grants permission to launch jobs from the specified project against the specified inventory
  - Run: launch jobs of type Run. This permission also grants the Check permission.
Check: launch jobs of type Check.

This menu displays a list of the permissions that are currently available. The permissions list may be sorted and searched by **Name, Inventory, Project or Permission** type.

To add new permissions to the team, click the **+** button, which takes us to the **Add Permission** dialog.

Enter the appropriate details into the following fields:

- **Permission Type**
  - **Inventory**
- **Name**
- **Description**
- **Inventory**
- **Permission**
  - **Read**
  - **Write**
  - **Admin**
Selecting a Permission Type of either Inventory or Deployment will change the appearance of the Add Permission dialog to present appropriate options for each type of permission.

For a permission of type **Inventory**, enter the following details:

- Inventory (Select from the available inventories)
- Permission
  - Admin
  - Read
  - Write

For a permission of type **Deployment**, enter the following details:

- Project (Select from the available projects)
- Inventory (Select from the available inventories)
- Permission
  - Run
  - Check

Select Save.
Teams - Projects

This displays the list of projects that this team has access to. This list may be searched by **Project Name** or **Description**. For more information about projects, please see the section **Projects**.

To add a project to the team, click the **+** button. Then select one or more projects from the list of available projects by clicking the Select checkbox or clicking anywhere on the user row. Click **Finished** when done.
To create a new project and add it to the team, click the button from the **Add Project** screen, which takes us to the **Create Project** dialog.

Enter the appropriate details into the following fields:

- **Name**
- **Description**
- **Organization**
- **SCM Type** (Select one of Manual, Git, Subversion, or Mercurial.)
- **Project Base Path** (Shown here as a convenience.)
- **Playbook Directory**

All fields are required. Select **Save**.
Teams - Users

This menu displays the list of users that are members of this team. This list may be searched by Username, First Name, or Last Name. For more information on users, please see the section Users.

To add users to the team, click the button. Then, select one or more users from the list of available users by clicking the Select checkbox or clicking anywhere on the user row. Click the Select button when done.

Credentials

Credentials are utilized by Tower for authenticating when launching jobs against machines, to synchronize with inventory sources, and to import project content from a version control system.
The **Credentials** tab displays a list of the credentials that are currently available. The credentials list may be sorted and searched by **Name**, **Description**, or **Type**.

Credentials may also be managed from either the **Teams** tab or the **Users** tab. To manage credentials for teams, please browse to the **Teams** tab and edit the appropriate team. Likewise, to manage credentials for a user, browse to the **Users** tab and edit the appropriate user.

Credentials added to a **Team** will be available to all members of the team, whereas credentials added to a user are only available to that user by default.

Buttons located in the upper right corner of the **Credentials** tab provide the following actions:

- Create a new credential
- View Activity Stream

**NOTE:** Tower encrypts passwords and key information in the Tower database and never makes secret information visible via the API.
Add a new credential

Create a new credential by selecting the + button.

Enter the appropriate details depending on the type of credential and select Save.

There are many types of Credentials:

Machine

Machine credentials define SSH and Sudo access for playbooks. They are used when submitting jobs to run playbooks on a remote host.

Machine credentials have several attributes that may be configured:

- **SSH Username**
  The username to be used to authenticate the user via SSH.

- **SSH Password**
  The actual password to be used to authenticate the user via SSH. This password may be stored encrypted in the Tower database, if entered. Alternatively, you may configure Tower to ask the user for the password when necessary by selecting *Ask at runtime?.* In that case, a dialog will open when the job is launched where the user may enter the password and password confirmation.

- **SSH Private Key**
The actual SSH Private Key to be used to authenticate the user via SSH. This key is stored encrypted in the Tower database.

- **Key Password**

If the SSH Private Key used is protected by a password, you may configure a Key Password for the private key. This password may be stored encrypted in the Tower database, if entered. Alternatively, you may configure Tower to ask the user for the password when necessary by selecting *Ask at runtime?*. In that case, a dialog will open when the job is launched where the user may enter the password and password confirmation.

- **Sudo Username**

The username to sudo to on the remote system.

- **Sudo Password**

The actual password to be used to authenticate the user via sudo on the remote system. This password may be stored encrypted in the Tower database, if entered. Alternatively, you may configure Tower to ask the user for the password when necessary by selecting *Ask at runtime?*. In that case, a dialog will open when the job is launched where the user may enter the password and password confirmation.

Sudo Password must be used in combination with SSH passwords or SSH Private Keys, since Tower must first establish an authenticated SSH connection with the host prior to invoking sudo to change to the sudo user.

- **Vault Password**

If your playbook uses Ansible Vault, add the Vault password to your credential here. Alternatively, you may configure Tower to ask the user for the vault password when necessary by selecting "*Ask at runtime?*." In that case, a dialog will open when the job is launched into which the user may enter the password and password confirmation.

For more information on how to use Ansible Vault, please visit: [http://docs.ansible.com/playbooks_vault.html](http://docs.ansible.com/playbooks_vault.html).

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*NOTE: Any credentials that will be used in Scheduled jobs must not be configured as*
Source Control

Used with Projects to clone and update local source code repositories from a remote revision control system such as Git, Subversion or Mercurial.

Source Control credentials have several attributes that may be configured:

- **Username**
  The username to use in conjunction with the source control system.

- **Password**
  The password to use in conjunction with the source control system.

- **SCM Private Key**
  The actual SSH Private Key to be used to authenticate the user to the source control system via SSH.

- **Key Password**
  If the SSH Private Key used is protected by a password, you may configure a Key Password for the private key.
Amazon Web Services

Enables synchronization of cloud inventory with Amazon Web Services.

Amazon Web Services credentials consist of the AWS Access Key and Secret Key here.
Rackspace

Enables synchronization of cloud inventory with Rackspace.

Rackspace credentials consist of the Rackspace **Username** and **API Key**.
VMware

Enables synchronization of inventory with VMware vCenter.

VMware credentials have several attributes that may be configured:

- **vCenter Host**
  
The vCenter hostname or IP address to connect to.

- **Username**
  
The username to use to connect to vCenter.

- **Password**
  
The password to use to connect to vCenter.

---

**NOTE:** If the VMware guest tools are not running on the instance, VMware inventory sync may not return an IP address for that instance.
Google Compute Engine

Enables synchronization of cloud inventory with Google Compute Engine.

Google Compute Engine credentials have several attributes that may be configured:

- **Service Account Email Address**
  The email address assigned to the Google Compute Engine service account.

- **RSA Private Key**
  The PEM file associated with the service account email.

- **Project**
  The GCE assigned identification. It is constructed as two words followed by a three digit number, such as: squeamish-ossifrage-123.
Microsoft Azure

Enables synchronization of cloud inventory with Windows Azure.

Microsoft Azure credentials have several attributes that may be configured:

- **Subscription ID**
  The Subscription UUID for the Microsoft Azure account.
- **Management Certificate**
  The PEM file that corresponds to the certificate you uploaded in the Microsoft Azure console.

Projects

A Project is a logical collection of Ansible playbooks, represented in Tower.

You can manage playbooks and playbook directories by either placing manually them under the Project Base Path on your Tower server, or by placing your playbooks into a source code management (SCM) system supported by Tower, including Git, Subversion, and Mercurial.
This menu displays a list of the projects that are currently available. The list of projects may be sorted and searched by **Name**, **Type**, or by **Status**. For each project listed, you can edit project properties and delete the project, using the edit and delete icons.

Buttons located in the upper right corner of the **Projects** tab provide the following actions:

- Create a new project
- View Activity Stream

**Status** indicates the state of the project, and may be one of the following:

- **Running** - Source control update is currently in progress
- **Never updated** - Project is configured for source control, but has never been updated
- **Failed** - The last source control update for this project failed
- **Successful** - The last source control update for this project succeeded
- **Missing** - The project directory is missing (valid for both manual or source control managed projects)
  - project has a last update, but the project directory is missing, or project doesn't use SCM and the directory is missing
- **OK** - The project is not configured for source control, and is correctly in place.

Under **Actions**, the following actions are available:

- Invoke an immediate update from source control, if configured for this project
- Schedule an update from source control, if configured for this project
- Edit the project
• Delete the project
• Cancel a running or scheduled update from source control, if configured for this project

Add a new project

To create a new project, click the button, which takes us to the Create Project dialog.
Enter the appropriate details into the following fields:

- Name
- Description
- Organization

A project must have at least one organization. Pick one organization now to create the project, and then after the project is created you can add additional organizations.

- SCM Type
  Select one of Manual, Git, Subversion, or Mercurial. (See the appropriate section below for more detail.)

- Project Base Path (Shown here as a convenience.)
- Project Path (The project paths show here are automatically read from the directory tree with a root of the project base path.)

All fields are required.
To manage playbooks manually

- Create one or more directories to store playbooks under the Project Base Path (e.g. "/var/lib/awx/projects/")
- Create or copy playbook files into the playbook directory.
- Ensure that the playbook directory and files are owned by the same UNIX user and group that the Tower service runs as.
- Ensure that the permissions are appropriate for the playbook directories and files.

If you have trouble adding a project path, check the permissions and SELinux context settings for the project directory and files.

**NOTE:** Each project path can only be assigned to one project. If you receive the following message, ensure that you have not already assigned the project path to an existing project.

"All of the project paths have been assigned to existing projects, or there are no directories found in the base path. You will need to add a project path before creating a new project."
To manage playbooks using Source Control

- Select the appropriate SCM Type.

  - Name
    Examples

  - Description
    Ansible Example Playbooks

  - SCM Type
    Git

  - SCM URL
    https://github.com/ansible/ansible-examples.git

  - SCM Branch

  - SCM Credential

  - SCM Update Options
    - Clean
    - Delete on Update
    - Update on Launch

  - Save
  - Reset

- Enter the appropriate details into the following fields:
  
  - SCM URL
  
  - SCM Branch
    Optionally enter the SCM branch for Git or Mercurial.
  
  - Revision # (Subversion only)
    Optionally enter the Revision # for Subversion.
  
  - If authentication is required, select the appropriate SCM credential.
  
  - Clean
    Remove any local modifications prior to performing an update.
• **Delete on Update**
  Delete the local repository in its entirety prior to performing an update. Depending on the size of the repository this may significantly increase the amount of time required to complete an update.

• **Update on Launch**
  Each time a job runs using this project, perform an update to the local repository prior to starting the job. To avoid job overflows if jobs are spawned faster than the project can sync, selecting this allows you to configure a Cache Timeout to cache prior project syncs for a certain number of seconds.

Click **Save** to save your project.

**Updating projects from source control**

Update an existing SCM-based project by clicking the **button. This starts an update task.**

Click the **Status** icon to get further details about the update process:

![Job Results](image)

To set a schedule for updating the project from SCM, click the **button. This will navigate to the **Schedules** screen.
This screen displays a list of the schedules that are currently available for the selected Project. The schedule list may be sorted and searched by Name.

The list of schedules includes:

- **Name** - Clicking the schedule name will open the Edit Schedule dialog
- **First Run** - the first scheduled run of this task
- **Next Run** - the next scheduled run of this task
- **Final Run** - If the task has an end date, this is the last run of the task

Buttons located in the upper right corner of the Schedules screen provide the following actions:

- Create a new schedule
- Refresh this view
- View Activity Stream
Add a new schedule

To create a new schedule click the + button, which opens the Edit Schedule dialog.

Enter the appropriate details into the following fields and select Save:

- Name (required)
- Start Date (required)
- Start Time (required)
- Local Time Zone (the entered Start Time should be in this timezone)
- UTC Start Time (calculated from Start Time + Local Time Zone)
- Repeat Frequency - the appropriate options will display as the update frequency is modified.

The Details tab will display a description of the schedule and a list of the scheduled occurrences in the prior selected Local time or UTC, as selected.
There are several actions available for schedules, under the **Actions** column:

- Stop an active schedule or activate a stopped schedule
- Edit Schedule
- Delete schedule

**Inventories**

An inventory is a collection of hosts against which jobs may be launched. Inventories are divided into groups and these groups contain the actual hosts. Groups may be sourced manually, by entering host names into Tower, or from one of Ansible Tower's supported cloud providers.

**NOTE:** Jobs are scheduled in UTC. Repeating jobs that runs at a specific time of day may move relative to a local timezone when Daylight Savings Time shifts occur.

**NOTE:** If you have a custom dynamic inventory script, or a cloud provider that is not yet supported natively in Tower, you can also import that into Tower. Please see the section on [Administration of Tower](#administration-of-tower)
This tab displays a list of the inventories that are currently available. The inventory list may be sorted and searched by Name or Organization and filtered by inventories with external sources, inventories with external sources that have failed to update, and inventories whose hosts have failed jobs.

The list of inventories includes:

- **Status** - this includes the status of inventory synchronization for inventories configured with cloud sources, and the status of recent jobs for this inventory
- **Name** - the inventory name. Clicking the Inventory name will navigate to the properties screen for the selected inventory, which shows the inventory's groups and hosts. (This view is also accessible from the Action menu.)
- **Organization** - the organization that the inventory belongs to
- **Actions** - the following actions are available for the selected inventory:
  - Edit - Edit the properties for the selected inventory
  - Delete - Delete the selected inventory. This operation cannot be reversed!

Buttons located in the upper right corner of the Inventories tab provide the following actions:

- Create a new inventory
- View Activity Stream
Add a new inventory

To create a new inventory click the button, which opens the Create Inventory window.

Enter the appropriate details into the following fields and select Save:

- Name (required)
- Description
- Organization (Select from the available organizations)
- Variables
  Variable definitions and values to be applied to all hosts in this inventory. Enter variables using either JSON or YAML syntax. Use the radio button to toggle between the two.

Groups

Inventories are divided into groups, which may contain hosts and other groups. An inventory must contain at least one group.

To add a group to an inventory or to manage an existing group, select Edit from the Actions menu for the selected inventory or click the inventory name.
This screen displays list of groups and hosts that belong to the selected Inventory.

There are several actions available for inventories.

- Create a new Group
- Edit Inventory properties
- View activity stream
- Help

Under Groups, you can see the groups for this inventory. Groups can be filtered or searched by group name.

Additional actions may be performed on the group by selecting the buttons to the right of the group name:

- Sync status - Show the status of inventory synchronization for groups configured with cloud sources. If synchronization is configured, clicking this button will show the synchronization log for the selected group.
- Host status - Show the status of successful and failed jobs for the selected group. Clicking this button will show the list of hosts that are members of the selected group.
- Start sync process - Initiate a synchronization of the group with the configured cloud source. (A synchronization process that is in progress may be canceled by clicking the cancel button that appears here during synchronization.)
- Edit Group - Edit the properties for the selected group
- Copy Group - Groups can be nested. This allows you to copy or move the group to a different group.
- Delete - Delete the selected group. This operation cannot be reversed!
**Add a new group**

Create a new group by clicking the button, which opens the Create Group window.

Enter the appropriate details into the following fields and click **Save**.

- **Name** (required)
- **Description**
- **Variables**
  Variable definitions and values to be applied to all hosts in this group. Enter variables using either JSON or YAML syntax. Use the radio button to toggle between the two.

By default, the group **Source** is manual, which means that the hosts must be entered into Tower manually. (See **Add a new host** for more information on managing hosts individually.)
To synchronize the inventory group from a cloud source, select the **Source** tab and choose the appropriate source from the **Source** menu.

Tower 2.0 supports Amazon Web Services EC2, Rackspace Cloud Servers, Google Compute Engine, VMware vCenter, and Microsoft Azure.

All cloud inventory sources have the following options:
• **Update Options**

  ◦ **Overwrite**
    
    When checked all child groups and hosts not found on the remote source will be deleted from the local inventory.
    
    When not checked any local child hosts and groups not found on the external source will remain untouched by the inventory update process.

  ◦ **Overwrite Variables**
    
    If checked, all variables for child groups and hosts will be removed and replaced by those found on the external source.
    
    When not checked a merge will be performed, combining local variables with those found on the external source.

  ◦ **Update on Launch**
    
    Each time a job runs using this inventory, refresh the inventory from the selected source before executing job tasks. To avoid job overflows if jobs are spawned faster than the inventory can sync, selecting this allows you to configure a Cache Timeout to cache prior inventory syncs for a certain number of seconds.

---

**NOTE:** If you intend to use Tower's provisioning callback feature with a dynamic inventory source, **Update on Launch** should be set for the inventory group.
**Amazon Web Services EC2**

To configure a group for AWS, select **Amazon EC2** and enter the following details:

- **Cloud Credential**
  Choose from an existing credential. For more information, see the **Credentials** section.

- **Regions**
  Click on the regions field to see a list of regions for your cloud provider. You can select multiple regions, or choose "All" to include all regions. Tower will only be updated with Hosts associated with the selected regions.

- **Source Variables**
  Override variables found in ec2.ini and used by the inventory update script. For a detailed description of these variables [view ec2.ini in the Ansible GitHub repo](https://github.com/ansible/ansible/blob/devel/plugins/inventory/ec2.ini).

  Enter variables using either JSON or YAML syntax. Use the radio button to toggle between the two.
**Rackspace Cloud Servers**

To configure a group for Rackspace, select **Rackspace Cloud Servers** and enter the following details:

- **Cloud Credential**
  
  Choose from an existing Credential. For more information, see the *Credentials* section.

- **Regions**

  Click on the regions field to see a list of regions for your cloud provider. You can select multiple regions, or choose "All" to include all regions. Tower will only be updated with Hosts associated with the selected regions.
Google Compute Engine

To configure a group for Google Compute Engine, select Google Compute Engine and enter the following details:

- **Cloud Credential**
  Choose from an existing Credential. For more information, see the Credentials section.

- **Regions**
  Click on the regions field to see a list of regions for your cloud provider. You can select multiple regions, or choose "All" to include all regions. Tower will only be updated with Hosts associated with the selected regions.
**VMware vCenter**

To configure a group for VMware vCenter, select **VMware** and enter the following details:

- **Cloud Credential**
  Choose from an existing Credential. For more information, see the **Credentials** section.
**Microsoft Azure**

To configure a group for Microsoft Azure, select **Microsoft Azure** and enter the following details:

- **Cloud Credential**
  Choose from an existing Credential. For more information, see the [Credentials](#) section.

- **Regions**
  Click on the regions field to see a list of regions for your cloud provider. You can select multiple regions, or choose "All" to include all regions. Tower will only be updated with Hosts associated with the selected regions.

**Scheduling**

For groups sourced from a cloud service, the inventory update process may be scheduled via the [Schedule](#) tab in the **Edit Group** dialog.
This screen displays a list of the schedules that are currently available for the selected Group. The schedule list may be sorted and searched by Name.

The list of schedules includes:

- Name - Clicking the schedule name will open the Edit Schedule dialog
- First Run
- Next Run

Buttons located in the upper right corner of the Schedules screen provide the following actions:

- Create a new schedule
- Refresh this view
Add a new schedule

To create a new schedule click the button.

Enter the appropriate details into the following fields and select Save:

- Name (required)
- Start Date (required)
- Start Time (required)
- Local Time Zone (the entered Start Time should be in this timezone)
- UTC Start Time (calculated from Start Time + Local Time Zone)
- Repeat Frequency - the appropriate options will display as the update frequency is modified.

The Details tab will display a description of the schedule and a list of the scheduled occurrences in the prior selected Local time or UTC, as selected.
Once you’ve saved the schedule, it will be shown on the Schedule tab.

There are server actions available for schedules:

- Stop an active schedule or activate a stopped schedule
- Edit Schedule
- Delete schedule

**NOTE:** Jobs are scheduled in UTC. Repeating jobs that run at a specific time of day may move relative to a local timezone when Daylight Savings Time shifts occur.
Hosts

Hosts are listed in the lower area of the Inventory display screen.

The host list may be sorted and searched by Name or Groups and filtered by hosts that are disabled, by hosts with failed jobs, and hosts synchronized with an external source.

This list displays information about each host and provides for several actions:

- **Name** - Opens the Host Properties dialog
- **Available** - A toggle indicating whether the host is enabled to receive jobs from Tower. Click to toggle this setting.
- **Jobs** - Shows the most recent Jobs run against this Host. Clicking this button will display a window showing the most recent jobs and their status.
- **Edit host** - Opens the Host Properties dialog
- **Copy host** - Copies or moves the host to a different group
- **Delete** - Removed the host from Tower. *This operation is not reversible!*

**Add a new host**

To create a new host and add it to an existing group, click the button.
This will open to the **Create New Host** dialog.

Enter the appropriate details into the following fields and click **Save**:

- **Host Name** - The hostname or IP address of the host
- **Description**
- **Enabled?** - Indicates if a host is available and should be included in running jobs. For hosts that are part of an external inventory, this flag cannot be changed. It will be set by the inventory sync process.
- **Variables**

Variable definitions and values to be applied to the selected host. Enter variables using either JSON or YAML syntax, using the radio button to toggle between JSON or YAML.

---

**Job Templates**

A job template is a definition and set of parameters for running an Ansible job. Job templates are useful to execute the same job many times. While the REST API allows executing jobs directly, Tower requires first creating a job template.
This menu opens a list of the job templates that are currently available. The job template list may be sorted and searched by **Name** or **Description**. The **Job Templates** tab also enables the user to launch, schedule, modify, and remove a job template.

To create a new job template click the **+** button.

Enter the appropriate details into the following fields:

- **Name** (required)
- **Description**
- **Job Type:**
  - **Run:** Execute the playbook when launched, running Ansible tasks on the selected hosts
Check: Execute the playbook in dry-run mode, reporting "changed" when an item would be changed, but not actually making changes.

More documentation on job types may be found in the Playbooks: Special Topics section of the Ansible documentation.

- Inventory: Choose the inventory to be used with this job template from the inventories available to the currently logged in Tower user.

- Project: Choose the project to be used with this job template from the projects available to the currently logged in Tower user.

- Playbook: Choose the playbook to be launched with this job template from the available playbooks. This menu is automatically populated with the names of the playbooks found in the project base path for the selected project. For example, a playbook named "jboss.yml" in the project path will appear in the menu as "jboss".

- Credential: Choose the credential to be used with this job template from the credentials available to the currently logged in Tower user.

- Cloud Credential: Choose the credential to be used with this job template from the credentials available to the currently logged in Tower user.

- Forks: The number of parallel or simultaneous processes to use while executing the playbook. A value of zero will use the Ansible default setting, which is 5 parallel processes unless overridden in /etc/ansible/ansible.cfg.

- Limit: A host pattern to further constrain the list of hosts that will be managed or affected by the playbook. Multiple patterns can be separated by colons ("::"). As with core Ansible, "a:b" means "in group a or b", "a:b\&c" means "in a or b but must be in c", and "a:!b" means "in a, and definitely not in b".

  For more information and examples see Patterns in the Ansible documentation.

- Job Tags: A comma-separated list of playbook tags to constrain what parts of the playbooks will be executed.

  For more information and examples see Tags in the Ansible documentation.
• Verbosity: Control the level of output Ansible will produce as the playbook executes. Set the verbosity to any of Default, Verbose, or Debug. This only appears in the "details" report view. Verbose logging will include the output of all commands. Debug logging is exceedingly verbose and will include information on SSH operations that can be useful in certain support instances. Most users will not need to see debug mode output.

• Extra Variables: Pass extra command line variables to the playbook. This is the "-e" or "--extra-vars" command line parameter for ansible-playbook that is documented in the Ansible documentation at Passing Variables on the Command Line (http://docs.ansible.com/playbooks_variables.html#passing-variables-on-the-command-line). Provide key/value pairs using either YAML or JSON. These variables have a maximum value of precedence and will override other variables specified elsewhere. An example value might be:

```
---

git_branch: production
release_version: 1.5
```

• Prompt for Extra Variables: If this is checked, the user will be prompted for Extra Variables at job execution. The set of extra variables will default to any Extra Variables already configured for the job template.

• Allow Callbacks: Enable a host to call back to Tower via the Tower API and invoke the launch of a job from this job template. See Provisioning Callbacks, below.

When you have completed configuring the job template, select Save.

When editing an existing job template, by clicking the job template name or the Edit button, the bottom of the screen will display a list of all of the jobs that have been launched from this template. Please see the section Jobs for more information about this interface.

**Provisioning Callbacks**

Provisioning callbacks are a feature of Tower that allow a host to initiate a playbook run against itself, rather than waiting for a user to launch a job to manage the host from the tower console. This provides for automatically configuring a system after it has been provisioned by another system (such as AWS auto-scaling, or a OS provisioning system like kickstart or preseed) or for launching a job programmatically without invoking the Tower API directly.

Frequently this would be accessed via a firstboot type script, or from cron.
To enable callbacks, check the **Allow Callbacks** checkbox. This will display the **Provisioning Callback URL** for this job template.

Callbacks also require a Host Config Key, to ensure that foreign hosts with the URL cannot request configuration. Click the **🔗** button to create a unique host key for this callback, or enter your own key. The host key may be reused across multiple hosts to apply this job template against multiple hosts. Should you wish to control what hosts are able to request configuration, the key may be changed at any time.

To callback manually via REST, look at the callback URL in the UI, which is of the form:

```
http://<Tower server name>/api/v1/job_templates/1/callback/
```

The '1' in this sample URL would be the job template ID in Tower.

The request from the host must be a POST. Here is an example using curl (all on a single line):

```
root@localhost:~$ curl --data "host_config_key=5a8ec154832b780b9bdef1061764ae5a" \ 
   http://api/v1/job_templates/1/callback/
```

The requesting host must be defined in your inventory for the callback to succeed. If Tower fails to locate the host either by name or IP address in one of your defined inventories, the request will be denied. Note that if your host is not in inventory, if **Update on Launch** is set for the inventory group, Tower will try to update cloud based inventory source before running the callback.

Successful requests will result in an entry on the Jobs tab, where the results and history can be viewed.

While the callback can be accessed via REST, the suggested method of using the callback is to use an example script that ships with Tower at `/usr/share/awx/request_tower_configuration.sh`. Usage is described in the source code of the file. This script is intelligent in that it knows how to retry commands and is therefore a more robust way to use callbacks than a simple curl request. As written, the script will retry once per minute for up to ten minutes, which is amply conservative.

**NOTE:** If you intend to use Tower's provisioning callback feature with a dynamic inventory, **Launch** should be set for the inventory group used in the Job Template.
Most likely you will be using callbacks with dynamic inventory in Tower, such as pulling cloud inventory from one of the supported cloud providers. In these cases, along with setting \textit{Update On Launch}, be sure to configure an inventory cache timeout for the inventory source, to avoid abusive hammering of your Cloud's API endpoints. Since the \texttt{request\_tower\_configuration.sh} script will poll once per minute for up to ten minutes, a suggested cache invalidation time for inventory (configured on the inventory source itself) would be one or two minutes.

While we recommend against running the \texttt{request\_tower\_configuration.sh} script from a cron job, a suggested cron interval would be perhaps every 30 minutes. Repeated configuration can be easily handled by scheduling in Tower, so the primary use of callbacks by most users will be to enable that a base image is bootstrapped into the latest configuration upon coming online. To do so, running at first boot is a better practice. First boot scripts are just simple init scripts that typically self-delete, so you would set up an init script that called a copy of the \texttt{request\_tower\_configuration} script and bake that into an autoscaling image.

This is a bit of an advanced feature, so if you have questions about ideal configuration of callbacks for autoscaling in your environment, feel free to reach out to us at \url{http://support.ansible.com/} for some suggestions and advice.

\textbf{Launching Jobs}

To launch a job template, click the \href{#}{\faExternalLink} button.

If credentials require the user to enter additional information, such as a password or passphrase, a dialog will request this information. If \texttt{Prompt For Extra Variables} has been set for this job template, they will also be requested at this time.

Along with any extra variables set in the job template, Tower automatically adds the following variables to the job environment:

- \texttt{tower\_job\_id}: The Job ID for this job run
- \texttt{tower\_job\_launch\_type}: One of \texttt{manual, callback,} or \texttt{scheduled} to indicate how the job was started
- \texttt{tower\_job\_template\_id}: The Job Template ID that this job run uses
- \texttt{tower\_job\_template\_name}: The Job Template name that this job uses
- \texttt{tower\_user\_id}: The user ID of the Tower user that started this job. This is not available for callback or scheduled jobs.
- \texttt{tower\_user\_name}: The user name of the Tower user that started this job. This is not available for callback or scheduled jobs.

Upon launch, Tower will automatically redirect the web browser to the Job Status page for this job under the \texttt{Jobs} tab.
Scheduling

Launching job templates may also be scheduled via the button. Clicking this button will open the Schedules page.

This page displays a list of the schedules that are currently available for the selected Job Template. The schedule list may be sorted and searched by Name.

The list of schedules includes:

- Name - Clicking the schedule name will open the Edit Schedule dialog
- First Run - the first scheduled run of this task
- Next Run - the next scheduled run of this task
- Final Run - If the task has an end date, this is the last run of the task

Buttons located in the upper right corner of the Schedules screen provide the following actions:

- Create a new schedule
- Refresh this view
- View Activity Stream
Add a new schedule

To create a new schedule click the button.

Enter the appropriate details into the following fields and select Save:

- Name (required)
- Start Date (required)
- Start Time (required)
- Local Time Zone (the entered Start Time should be in this timezone)
- UTC Start Time (calculated from Start Time + Local Time Zone)
- Repeat Frequency - the appropriate options will display as the update frequency is modified.

The Details tab will display a description of the schedule and a list of the scheduled occurrences in the prior selected Local time or UTC, as selected.
There are several actions available for schedules, under the **Actions** column:

- Stop an active schedule or activate a stopped schedule
- Edit Schedule
- Delete schedule

### Jobs

A job is an instance of Tower launching an Ansible playbook against an inventory of hosts.
The Jobs tab displays a list of jobs, including jobs that are completed, active, queued, and scheduled.

### Completed Jobs

The list of **Completed** jobs may be searched by **Job ID** or **Name**, and filtered by **Job failed?**, or **Type**.

- **Job ID**: A unique integer that identifies a specific job.

- **Status**: Will be **Successful**, or **Failed** for completed jobs. Clicking this displays the job details. For a job of type **SCM Update** and **Inventory Sync**, clicking the name will open the **Job Results** window. For **Playbook Runs**, clicking the name will open the **Job** display for that job.

- **Finished On**: The date and time the job finished, in the server's local time.

- **Type**: The type of the job. Jobs can be **Inventory Sync** (for cloud inventory sources), **SCM Update** (for projects under source control), and **Playbook Run**.

- **Name**: Clicking this displays the job details.

- **Actions**: Depending on the job type, there are several actions available for each job:
Active Jobs

The list of Active jobs may be searched by Job ID or Name, and filtered by Type.

- **Job ID**: A unique integer that identifies a specific job.
- **Status**: Will be Running for active jobs. Clicking this displays the job details.
- **Started On**: The date and time the job started, in the server's local time.
- **Type**: The type of the job.
- **Name**: Clicking this displays the job details.
- **Actions**: Depending on the job type, there are several actions available for each job:
  - **Relaunch**: Launch this job again, with the same parameters as it originally ran with. (Any modification to the job template after the job was launched will not be used during this re-launch.)
  - **Cancel**: This button cancels the job run.
  - **View Job Details**: This gives a view of the job details, in the same way as clicking on the Name or Status of the job.

- **View Standard Output**: For jobs of type Playbook Run, this opens the Standard Out view of the Job Details page for that job.

Queued Jobs

Queued jobs are pending jobs that are queued to be run but are not currently active. The list of Queued jobs may be searched by Job ID or Name, and filtered by Type.
• **Job ID**: A unique integer that identifies a specific job.

• **Status**: Will be *pending* for queued jobs. Clicking this displays the job details.

• **Created On**: The date and time the job was created, in the server's local time.

• **Type**: The type of the job.

• **Name**: Clicking this displays the job details.

• **Actions**: Depending on the job type, there are several actions available for each job:
  - **Relaunch**: Launch this job again, with the same parameters as it originally ran with. (Any modification to the job template after the job was launched will not be used during this re-launch.)
  - **Cancel**: This button cancels the job run.
  - **View Job Details**: This gives a view of the job details, in the same way as clicking on the Name or Status of the job.

### Scheduled Jobs

The list of **Scheduled** jobs may be searched by **Name**.

• **Number**: The order of the scheduled job.

• **Status**: Shows whether the schedule is active and will run. Click to change the status the scheduled job.

• **Next Run**: When the job is scheduled to run.

• **Type**: One of **SCM Update**, **Inventory Sync**, or **Playbook Run**.

• **Name**: Clicking the name will open the schedule for this job, where it can be updated.

• **Actions**:
  - **Play/Stop**: Activate or deactivate the scheduled job.
  - **Edit**: Edit the job schedule. To edit the job itself, you will need to edit it from the **Inventory**, **Project**, or **Job Template** views.
  - **Delete**: Delete the scheduled job.
Job Results

The Job Results window displays information about jobs of type **Inventory Sync** and **SCM Update**.

This display consists of three tabs. The **Status** tab includes details on the job execution:

- **Name**: The name of the job template from which this job was launched.
- **Status**: Can be any of **Pending**, **Running**, **Successful**, or **Failed**.
- **License Error**: Only shown for **Inventory Sync** jobs. If this is **True**, the hosts added by the inventory sync caused Tower to exceed the licensed number of managed hosts.
- **Started**: The timestamp of when the job was initiated by Tower.
- **Finished**: The timestamp of when the job was completed.
- **Elapsed**: The total time the job took.
- **Launch Type**: **Manual** or **Scheduled**.
The **Standard Out** tab 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.

The **Options** tab describes the details of this job. For SCM Update jobs, this consists of the **Project** associated with the job. For Inventory Sync jobs, this consists of:

- **Credential**: The cloud credential for the job
- **Group**: The group being synced
- **Source**: The type of cloud inventory
- **Regions**: Any region filter, if set
- **Overwrite**: The value of **Overwrite** for this Inventory Sync. See the **Inventory** section of this manual for details.
- **Overwrite Vars**: The value of **Overwrite Vars** for this Inventory Sync. See the **Inventory** section for this manual for details.

**Job**

The **Job** page for **Playbook Run** jobs shows details of all the tasks and events for that playbook run.
The **Job** page consists of multiple areas: **Status**, **Plays**, **Tasks**, **Host Events**, **Events Summary**, and **Hosts Summary**.

### Status

The **Status** area shows the basic status of the job - *Running*, *Pending*, *Successful*, or *Failed*, and its start time. The buttons in the top right of the status page allow you to view the standard output of the job run, delete the job run, or relaunch the job.

Clicking on *more* gives the basic settings for this job:

- the **Job Template** for this job
- the job **Type**: *Run* or *Check*
- the **Inventory** associated with this job
- the **Project** associated with this job
- the playbook that is being run
- the **Credential** in use
- any **Limit** settings for this job
- the **Verbosity** setting for this job
- any **Extra Variables** that this job used

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

### Plays

The **Plays** area shows the plays that were run as part of this playbook. The displayed plays can be filtered by **Name**, and can be limited to only failed plays.

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

### Tasks

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

For each task, Tower shows the start time for the task, the elapsed time of the task, the task **Name**, whether the task succeeded or failed, and a summary of the host status for that task. The host status displays a summary of the hosts status for all hosts touched by this task. Host status can be one of the following:
• **Success**: the playbook task returned "Ok".
• **Changed**: the playbook task actually executed. Since Ansible tasks should be written to be idempotent, tasks may exit successfully without executing anything on the host. In these cases, the task would return Ok, but not Changed.
• **Failure**: the task failed. Further playbook execution was stopped for this host.
• **Unreachable**: the host was unreachable from the network or had another fatal error associated with it.
• **Skipped**: the playbook task was skipped because no change was necessary for the host to reach the target state.

Clicking on a specific task filters the **Host Events** area to only display hosts relative to that task.

**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. You can click on the button to edit the host. Clicking on the host 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:

- Host
- Status
  - a unique ID
  - the time this task was started
- the Role for this task
- the name of the Play
- the name of the Task
- if applicable, the Ansible module for the task, and any arguments for that module

The Host Event dialog includes a Results tab that shows the results of this task. The fields displayed on this tab will be specific to the task and the module used. There is also a JSON tab that displays the result in JSON format.

Events Summary

The Events Summary area shows a summary of events for all hosts affected by this playbook. Hosts can be filtered by Name, and can be limited to only failed hosts.

For each host, the Events Summary area shows the host name and the number of completed tasks for that host, sorted by status. You can also click on the button to edit the host.
Clicking on the host name brings up a **Host Events** dialog that shows all tasks that affected that host.

This dialog can be filtered by the result of the tasks, and also by the host name. For each event, Tower displays the status, the affected host, the play name, and the task name. Clicking on the status brings up a the same **Host Event** dialog that would be shown for that host and event from the Host Events area.

**Host Summary**

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

**Best Practices**

**Ansible file and directory structure**

Please review the Ansible best practices from the Ansible documentation at [http://docs.ansible.com/playbooks_best_practices.html](http://docs.ansible.com/playbooks_best_practices.html).

Playbooks should not use the `vars_prompt` feature, as Tower does not interactively allow Q&A for questions at this time.
Jobs run in Tower use the playbook directory as the current working directory, although jobs should be coded to use the `playbook_dir` variable rather than relying on this.

## Inventory Management

Keeping variable data along with the objects in Tower (see the inventory editor) is encouraged, rather than using `group_vars/` and `host_vars/`. If you use the `tower-manage inventory_import` command (see Administration of Tower) on an inventory source, it can sync such variables with the database.

## Scaling

Using the "callback" feature to allow newly booting instances to request configuration is very useful for auto-scaling scenarios or provisioning integration.

Consider setting "forks" on a job template to larger values to increase parallelism of execution runs. For more information on tuning Ansible, see the Ansible blog (http://www.ansible.com/blog/ansible-performance-tuning).

## Continuous integration / Continuous Deployment

For a Continuous Integration system, such as Jenkins, to spawn an Tower job, it should make a curl request to a job template. The credentials to the job template should not require prompting for any particular passwords. Using the API to spawn jobs is covered in the API section.

## Security

The multi-tenancy features of Tower are sufficient to control who can run certain projects on what systems, but are not intended to hide project content from other teams. For instance, you could easily control that engineering could not push to production.

All playbooks are executed via the "awx" filesystem user. Users who have access to edit playbooks need to be trusted as playbooks do have access to the filesystem and all that implies.

Users concerned about credential security may choose to upload locked SSH keys and set the unlock password to "ask", or choose to have the system prompt them for SSH credentials or sudo passwords rather than having the system store them in the database.
Administration of Tower

Tower init script

Tower ships with a standard `ansible-tower` init script that can be used to start, stop, and query the full tower infrastructure (including the database and message queue components.) You can invoke it via the `service` command:

```
root@localhost:~$ service ansible-tower restart
```

or via distribution-specific service management commands.

**tower-manage**

tower-manage (formerly awx-manage) is a utility that can be used to access detailed internal information of Tower.

tower-manage is the mechanism by which a Tower administrator can import inventory directly into Tower.

```
tower-manage inventory_import [--help]
```

The inventory_import command is used to synchronize an Tower inventory object with a text-based inventory file, dynamic inventory script, or a directory of one or more of the above as supported by core Ansible.

When running this command, specify either an `--inventory-id` or `--inventory-name`, and the path to the Ansible inventory source is given by `--source`.

By default, inventory data already stored in Tower will be blended with data from the external source. To use only the external data, specify `--overwrite`. To specify that any existing hosts get variable data exclusively from the `--source`, specify `--overwrite-vars`. The default behavior will add any new variables from the external source, overwriting keys that do not already exist, but preserving any variables that were not sourced from the external data source.

**NOTE:** Do not run other `tower-manage` commands unless instructed by Ansible Support.
Tower monitoring

Tower includes its own munin instance for monitoring Tower. This interface can be accessed via the **Monitor Tower** dropdown of the Tower user's menu at the top right of the Tower interface, and also directly at `https://<Tower server name>/munin`.

The default munin user is `admin`, and the default password is set in `group_vars/all` at installation time.

This monitors general aspects of the Tower system, such as the apache webserver, networking, disk I/O and free storage, system processes, and CPU usage.

It also monitors aspects specific to Tower, under the **Tower** heading.

It monitors the health of the following key Tower services:
• Celery Service
• RabbitMQ Service
• SocketIO Service
• Task Manager

It also monitors the running jobs, and the number of processes for receiving Tower callbacks.

Troubleshooting

Tower server errors are logged to syslog. Apache web server errors are logged to the httpd error log. Additional Tower logging can be configured in `/etc/awx/settings.py`.

Client-side issues may be explored using the JavaScript console built into most browsers and any errors should be reported to http://support.ansible.com/.

Using LDAP with Tower

As of the 1.3 release of Tower, administrators may utilize LDAP as a source for authentication information for Tower users. At this time, only user authentication is provided and not synchronization of user permissions, credentials, however organization membership (and who is an organization admin) and team memberships can be synchronized.

When so configured, a user who logs in with an LDAP username and password will automatically get a Tower account created for them and they can be automatically placed into multiple organizations as either regular users or organization administrators.

By default, if users are created via an LDAP login, by default they cannot change their username, firstname, lastname, or set a local password for themselves. This is also tunable to restrict editing of other field names.

Currently, LDAP integration for Tower is configured in the file `/etc/awx/settings.py`. No configuration is accessible via the Tower user interface. Please, review the comments in that file for information on LDAP configuration and let us know at http://support.ansible.com/ if you need assistance.
API

Tools

This document gives a basic understanding of the API, though you may wish to see what API calls Tower makes in sequence. To do this, using the UI from Firebug or Chrome with developer plugins is useful, though Charles Proxy (http://www.charlesproxy.com/) is also an outstanding visualizer that you may wish to investigate. It is commercial software but can insert itself as, for instance, an OS X proxy and intercept both requests from web browsers but also curl and other API consumers.

Browseable API

Tower features a browseable API feature.

You can visit the API in a browser at http://<Tower server name>/api and then click on various links in the API to explore related resources.
You can also PUT and POST on the specific API pages if you so desire by formatting JSON in the various text fields.

Conventions

With all of the basics about how to explore the API and database objects out of the way, it's now time for some general API info.

Tower uses a standard REST API, rooted at /api/ on the server. The API is versioned for compatibility reasons but only /api/v1/ is presently available. By querying /api you can see information about what API versions are available.

All data is JSON by default. You may have to specify the content/type on POST or PUT requests accordingly.

All URIs should end in "/" or you will get a 301 redirect.
## Sorting

Assume the following URL, `http://<Tower server name>/api/v1/groups/

In order to sort the groups by name, access the following URL variation:

`http://<Tower server name>/api/v1/groups/?order_by=name`

You can order by any field in the object.

## Filtering

Any collection is what the system calls a "queryset" and can be filtered via various operators.

For example, to find the groups that contain the name "foo":

`http://<Tower server name>/api/v1/groups/?name__contains=foo`

To do an exact match:

`http://<Tower server name>/api/v1/groups/?name=foo`

If a resource is of an integer type, you must add "__int" to the end to cast your string input value to an integer, like so:

`http://<Tower server name>/api/v1/arbitrary_resource/?x__int=5`

Related resources can also be queried, like so:

`http://<Tower server name>/api/v1/groups/?user__firstname__icontains=john`

This will return all groups with users with names that include the string "John" in them.

You can also filter against more than one field at once:

`http://<Tower server name>/api/v1/groups/?user__firstname__icontains=john&group__name__icontains__foo`

This will find all groups containing a user whose name contains John where the group contains the string foo.

For more about what types of operators are available, see:

[https://docs.djangoproject.com/en/dev/ref/models/querysets/](https://docs.djangoproject.com/en/dev/ref/models/querysets/)

You may also wish to watch the API as the UI is being used to see how it is filtering on various criteria.
Pagination

Responses for collections in the API are paginated. This means that while a collection may contain tens or hundreds of thousands of objects, in each web request, only a limited number of results are returned for API performance reasons.

When you get back the result for a collection you will see something like:

```
{'count': 25, 'next': 'http://testserver/api/v1/some_resource?page=2', 'previous': None, 'results': [ ... ]}
```

Where to get the next page, simply request the page given by the 'next' URL.

To request more items per page, pass the page size query string:

```
http://<Tower server name>/api/v1/some_resource?page_size=50
```

The serializer is quite efficient, but you should probably not request page sizes beyond a couple of hundred.

The user interface uses smaller values to avoid the user having to do a lot of scrolling.

Read Only Fields

Certain fields in the REST API are marked read only. These usually include the URL of a resource, the ID, and occasionally some internal fields. For instance, the 'created_by' attribute of each object indicates which user created the resource, and cannot be edited.

If you post some values and notice they are not changing, these fields may be read only.

tower-cli

tower-cli is a command line tool for Ansible Tower. It allows Tower commands to be easily run from the Unix command-line. It can also be used as a client library for other python apps, or as a reference for others developing API interactions with Tower's REST API.

Capabilities

tower-cli sends commands to the Tower API. It is capable of retrieving, creating, modifying, and deleting most objects within Tower.

A few potential uses include:

- Launching playbook runs (for instance, from Jenkins, TeamCity, Bamboo, etc)
• Checking on job statuses
• Rapidly creating objects like organizations, users, teams, and more

Installation

Tower CLI is available as a package on PyPI (https://pypi.python.org/pypi/ansible-tower-cli)
The preferred way to install is through pip:

```
$ pip install ansible-tower-cli
```

The main branch of this project may also be consumed directly from source.
For more information on tower-cli, see the project page at https://github.com/ansible/tower-cli.
Glossary

**Organization**: A logical collection of Users, Teams, Projects, and Inventories. The highest level in the Tower object hierarchy. See this description of the Tower hierarchy.

**User**: An Tower operator with associated permissions and credentials.

**Organization Administrator**: An Tower user with the rights to modify the Organization’s membership and settings, including making new users and projects within that organization. An organization admin can also grant permissions to other users within the organization.

**Team**: A sub-division of an Organization with associated Users, Projects, Credentials, and Permissions. Teams provide a means to implement role-based access control schemes and delegate responsibilities across Organizations.

**Project**: A logical collection of Ansible playbooks, represented in Tower.

**Inventory**: A collection of hosts against which Jobs may be launched.

**Credentials**: Authentication details that may be utilized by Tower to launch jobs against machines, to synchronize with inventory sources, and to import project content from a version control system.

**Job Template**: The combination of an Ansible playbook and the set of parameters required to launch it, designed to be reusable across hosts.

**Job**: The instantiation of a Job Template; the launch of an Ansible playbook.

**Permissions**: The set of privileges assigned to Users and Teams that provide the ability to read, modify, and administer Projects, Inventories, and other Tower objects.

**Host**: A system managed by Tower, which may include a physical, virtual, or cloud-based server, a network router, switch, or firewall, a storage device, or any unique system managed by Tower. Typically an operating system instance.

**Playbook**: An Ansible playbook.

**Superuser**: An admin of the Tower server who has permission to edit any object in the system, whether associated to any organization. Superusers can create organizations and other superusers.