Ansible Tower Installation and Reference Guide

Release Ansible Tower 3.1.3

Red Hat, Inc.

Jul 12, 2017

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

The *Ansible Tower Installation and Reference Guide* helps you to understand the installation requirements and processes behind installing Ansible Tower. This document has been updated to include information for the latest release of Ansible Tower 3.1.3.

Ansible Tower Version 3.1.3; May 01, 2017; https://access.redhat.com/

CHAPTER

ONE

TOWER LICENSING, UPDATES, AND SUPPORT

Ansible Tower by Red Hat ("**Ansible Tower**") is a proprietary software product provided via an annual subscription entered into between you and Red Hat, Inc. ("**Red Hat**").

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

1.1 Support

Red Hat offers support for paid **Enterprise: Standard** and **Enterprise: Premium** Subscription customers seeking help with the Ansible Tower product.

If you or your company has paid for Ansible Tower, you can contact the support team at https://access.redhat.com. To better understand the levels of support which match your Ansible Tower Subscription, refer to *Subscription Types*.

If you are experiencing Ansible software issues, you should reach out to the "ansible-devel" mailing list or file an issue on the Github project page at https://github.com/ansible/ansible/issues/.

All of Ansible's community and OSS info can be found here: https://docs.ansible.com/ansible/community.html

1.1.1 Ansible Playbook Support

For customers with a paid Enterprise: Standard or Enterprise: Premium Ansible Tower Subscription, Red Hat offers Ansible Playbook support[1]. Playbook support consists of support for:

- Runtime execution problems for Playbooks run via Tower
- Assistance with Playbook errors and tracebacks
- Limited best practice guidance in Ansible use from the Ansible Experts

Playbook support does not consist of:

- Enhancements and fixes for Ansible modules and the Ansible engine
- Assistance with the creation of Playbooks from anew
- Long-term maintenance of a specific Ansible or Ansible Tower version

[1] Playbook support is available for customers using the current or previous minor release of Ansible. For example, if the current version of Ansible is 2.2, Red Hat provides Ansible Playbook support for versions 2.2 and 2.1. In the event an Ansible Playbook workaround is not available, and an Ansible software correction is required, a version update will be required.

Notes:

1.2 Trial / Evaluation

While a license is required for Ansible Tower to run, there is no fee for managing up to 10 hosts. Additionally, trial licenses are available for exploring Ansible Tower with a larger number of hosts.

- Trial licenses for Ansible Tower are available at: http://ansible.com/license
- To acquire a license for additional Managed Nodes, visit: http://www.ansible.com/pricing/
- Ansible Playbook Support is not included in a trial license or during an evaluation of the Tower Software.

1.3 Subscription Types

Ansible Tower is provided at various levels of support and number of machines as an annual Subscription.

- **Self-Support**
  - Manage smaller environments (up to 250 Managed Nodes)
  - Maintenance and upgrades included
  - No support or SLA included
- **Enterprise: Standard (F.K.A. "Enterprise")**
  - Manage any size environment
  - Enterprise 8x5 support and SLA
  - Maintenance and upgrades included
  - Review the SLA at: https://access.redhat.com/support/offerings/production/sla
  - Review the Red Hat Support Severity Level Definitions at: https://access.redhat.com/support/policy/severity
- **Enterprise: Premium (F.K.A. "Premium Enterprise")**
  - Manage any size environment, including mission-critical environments
  - Premium 24x7 support and SLA
  - Maintenance and upgrades included
  - Review the SLA at: https://access.redhat.com/support/offerings/production/sla
  - Review the Red Hat Support Severity Level Definitions at: https://access.redhat.com/support/policy/severity

All Subscription levels include regular updates and releases of Ansible Tower.

For more information, contact Ansible via the Red Hat Customer portal at https://access.redhat.com/ or at http://www.ansible.com/pricing/.

1.4 Node Counting in Licenses

The Tower license defines the number of Managed Nodes that can be managed by Ansible Tower. A typical license will say 'License Count: 500', which sets the maximum number of Managed Nodes at 500.

Ansible Tower counts Managed Nodes by the number of hosts in inventory. If more Managed Nodes are in the Ansible Tower inventory than are supported by the license, you will be unable to start any Jobs in Ansible Tower. If a dynamic inventory sync causes Ansible Tower to exceed the Managed Node count specified in the license, the dynamic inventory sync will fail.

If you have multiple hosts in inventory that have the same name, such as "webserver1", they will be counted for licensing purposes as a single node. Note that this differs from the 'Hosts' count in Tower's dashboard, which counts hosts in separate inventories separately.

1.5 License Features

The following list of features are available for all new Enterprise: Standard or Enterprise: Premium Subscriptions:

- Workflows (*added in \at\ 3.1.0*)
- Clustering in Tower (*added in \at\ 3.1.0*)
- Custom re-branding for login (*added in Ansible Tower 2.4.0*)
- SAML and RADIUS Authentication Support (*added in Ansible Tower 2.4.0*)
- Multi-Organization Support
- Activity Streams
- Surveys
- LDAP Support
- Active/Passive Redundancy
- System Tracking (*added in Ansible Tower 2.2.0*)

Enterprise: Standard or Enterprise: Premium license users with versions of Ansible Tower prior to 2.2 must import a new license file to enable System Tracking.

1.6 Tower Component Licenses

To view the license information for the components included within Ansible Tower, refer to `/usr/share/doc/ansible-tower-<version>/README` where `<version>` refers to the version of Ansible Tower you have installed.

To view a specific license, refer to `/usr/share/doc/ansible-tower-<version>/*.txt`, where `*` is replaced by the license file name to which you are referring.

CHAPTER

TWO

RELEASE NOTES

The following list summarizes the additions, changes, and modifications which were made to Ansible Tower 3.1.3.

2.1 Ansible Tower Version 3.1.3

- Added Spanish translations for Ansible Tower
- Fixed a problem where survey password defaults of a certain length could prevent a job from launching
- Fixed truncation of long job run results causing an excessive number of blank lines
- Fixed a problem where running two different jobs in parallel from the same project could cause an error
- Fixed a problem where Splunk HTTP event collectors did not send job_event data
- Fixed a problem where email notifications could send survey password values in plain text in extra_vars
- Fixed handling of job output from certain modules
- Fixed a problem where setting "Required" for a Multiple Choice (Single Select) survey question could prevent changing the default
- Fixed a problem where provisioning callbacks configured to prompt for extra variables could return an error
- Fixed a problem where modifying team permissions when using a basic license would return an error
- Fixed a problem in LDAP configuration where adding values to the database caused users to lose permanent access to Tower
- Fixed an issue where a database restore could fail
- Fixed an issue where setup could fail if there was no firewall installed
- Fixed an issue where Insights projects could cause project syncs to fail
- Fixed an issue applying Tower configuration across cluster nodes
- Added the ability to disable SSL certificate verification for hosted Splunk logging
- Improved Ansible Tower to allow for passing extra_vars on ad_hoc commands
- Updated Ansible Tower so that it can process facts output from Ansible 2.3

2.2 Ansible Tower Version 3.1.2

- Added subpackaging for sever, UI, and setup packages
- Added support for Red Hat Insights project type

- Added support for explicitly specifying the host descriptor used for RabbitMQ config via *rabbitmq_host*
- Adjusted search on the Job Details screen to match the behavior across Tower
- Adjusted Tower logging to log asynchronously
- Fixed various and minor UI bugs
- Fixed a callback bug which was causing a *task_args* leak between job events
- Fixed an issue where jobs were not able to be sorted by descending ID
- Fixed an issue where, when working with Splunk, the log aggregator type shows as Logstash instead of Splunk
- Fixed an issue where, when a user has two groups in an inventory (one using a VMware script and one using a custom script), clicking *sync* on the custom script group caused the sync icon to link to the wrong inventory sync
- Fixed a problem where users were not able to put multi-line text in a Text Area-type field in a survey
- Fixed a problem where users who had admin access on Workflows, but were not Org level admins, could not add or remove job templates from Workflows
- Fixed a problem with job templates that include a multiple choice survey response, where, even when multiple selections are required, the job template ran with an empty array
- Fixed a problem where surveys were passing a variable as empty instead of null when they included text or a text area field that had a minimum length >0 and was not filled in
- Fixed a problem where Tower jobs hang and do not run when the Splunk server is unresponsive or unavailable
- Fixed a problem where users with admin level permissions on projects could not modify project details
- Fixed a problem in multiple choice survey inputs where, when selecting a string that had similar characters or words at the beginning or end of the string, a similar but smaller version of that string was rendered as the user's selection (even though the correct value was still passed to extra-vars on launch)
- Fixed an issue around Git project updates failing when the username was specified
- Fixed a problem where job templates from mercurial project updates failed to run
- Fixed a problem with provisioning callbacks where they failed with '400' responses when extra_vars were passed to the API through curl in the callback
- Fixed a problem where running the installer again anytime after successfully creating the rabbitmq user caused the installation program to fail
- Fixed an issue where Windows package scan jobs fail when targeting a Windows 2012R2 host
- Fixed an issue where users with admin access to Workflow Templates could not modify the workflow
- Fixed an issue where a warning was incorrectly displayed for the output of a canceled job
- Fixed an issue where Mercurial project revisions were not read correctly for Projects
- Fixed an issue where Tower upgrades would fail when applying *rabbitmq_user* in a cluster
- Fixed an issue where certain characters in a Project SCM URL would cause updates to fail
- Improved custom inventory scripts support by ensuring that newlines added to the script are not trimmed
- Relaxed the SELinux policy dependency to allow Tower to be installed on older Enterprise Linux 7 releases
- Updated Ansible Tower so that the host config key is marked as required when provisioning callbacks are selected
- Updated Ansible Tower so that PostgreSQL Server is no longer installed on Tower nodes not hosting the database

- Updated Ansible Tower so that Tower shows *extra_vars* for ad-hoc commands in the UI

2.3 Ansible Tower Version 3.1.1

- Added a preflight check for password and pre-3.1.0 active/passive (HA) inventory setups prior to installation
- Fixed a problem where, while running a clustered Tower deployment configuration, there were some instances where realtime job event data did not flow through the channel layer
- Fixed a problem with searching where an invalid search term was entered and the error dialog continued to persist
- Fixed a problem with Slack notifications where they were not emitted if only 'Failure' was selected
- Fixed a problem where logging out via Tower logout button caused subsequent login attempts to fail
- Fixed an issue where, when logging was enabled, a missing logging UUID setting would cause a startup error, making the system unresponsive

2.4 Ansible Tower Version 3.1.0

- Added support for configuring most aspects of Ansible Tower directly from the Tower user interface (and Tower API), rather than editing Tower configuration files
- Added support for "Scale-Out" Clusters, which replaces the HA/Redundancy method from prior Tower releases
- Added support for Workflows, a chain of job templates executed in order
- Added support for sending event and log messages to various logging services (Elastic, Splunk, Sumologic, Loggly, generic REST endpoint)
- Added support for a new Tower Search feature which supports GitHub-style "key:value" searching
- Added support for Ubuntu 16.04
- Added support for a New Project Sync Architecture, where projects are now checked out at job runtime
- Added support for setting timeouts on job runs
- Added support for internationalization and localization (French and Japanese)
- Added support for multi-playbook Workflows
- Added `/api/v1/settings` for Tower managed settings. This corresponds to the in-Tower configuration UI
- Added support for windows scan jobs
- Added support so that the SCM Revision used is now stored on Job
- Added support for API endpoints to now show `__search` filter fields for broader searching of objects
- Added support so that system jobs are now shown in `/api/v1/unified_jobs`
- Added support for the new Ansible vmware_inventory script
- Added support for Job stdout downloads, which may generate and cache on the fly
- Added support for `/api/v1/inventory_updates` and `/api/v1/project_updates` to view those specific job types
- Added support for *user_capabilities* API elements in various places to allow API consumers to know if their user can perform the referenced actions on the object

- Added support for `set_stats` for Workflow jobs to persist data between Workflow job runs, support added in ansible core also
- Added support for Tower callbacks so that they can now resolve `ansible_host` as well as `ansible_ssh_host`
- Added support for Tower callbacks so that they now filter out `ansible_` variables on POST
- Added support for notifications so that they are emitted on jobs marked as failed by the dead job detector
- Added eu-west-2 and ca-central-1 to the list of supported EC2 regions
- Added support for `format=ansi_download` when downloading stdout
- Deprecated support for Rackspace inventories
- Fixed an issue where manual projects could be launched/updated
- Fixed various unicode issues
- Fixed various issues dealing with self signed certificates value.
- Fixed Jobs so that they now show `$encrypted` for these variables, where they previously did not
- Improved performance for viewing job and job template lists
- Improved Tower virtualenv so that it is purged on upgrade
- Improved setup playbook so that it is more tolerant of various iptables/firewalld configurations
- Improved the optimization of PostgreSQL installation to improve overall performance
- Improved database migrations through consolidation to make upgrades/installs faster
- Improved hardening for web server configuration (SSL, HSTS)
- Removed zeromq as a communications channel between dependent services in favor of rabbitmq
- Removed `/api/v1/jobs/n/job_plays` and `/api/v1/jobs/n/job_tasks`
- Removed proot in favor of bubblewrap for process isolation
- Removed the ability to make POST requests on the `/api/v1/jobs/` endpoint
- Removed has_schedules from various endpoints, as it was never populated
- Removed support for Red Hat Enterprise Linux 6/CentOS 6 and Ubuntu 12.04
- Updated surveys so that a blank value for a survey question default value now passes an empty string as a value
- Updated surveys so that previously existing surveys with blank default question values now pass empty strings as an extra variable
- Updated Websockets, moving them from socket.io to django channels and are now served under port 443/80 along with the regular web service. Port 8080 is no longer needed.
- Updated Job results so that they are now driven by job events and thus provides clickable context
- Updated Tower so that it now uses the system time zone by default
- Updated Tower requirements for Ansible–Tower now requires Ansible 2.1 or later
- Updated Ansible inventory plugins to the latest versions
- Updated Web server to NGINX from Apache
- Updated survey passwords so that they are now encrypted when stored in the database
- Updated `request_tower_configuration.sh`

For older version of the release notes, as well as other reference materials, refer to the Ansible Tower Release Notes.

CHAPTER

THREE

INSTALLATION NOTES

- If you need to access a HTTP proxy to install software from your OS vendor, ensure that the environment variable "HTTP_PROXY" is set accordingly before running `setup.sh`.
- The Tower installer creates a self-signed SSL certificate and keyfile at `/etc/tower/tower.cert` and `/etc/tower/tower.key` for HTTPS communication. These can be replaced after install with your own custom SSL certificates if you desire, but the filenames are required to be the same.
- If using Ansible version 1.8 or later, ensure that fact caching using Redis is not enabled in `ansible.cfg` on the Tower machine.
- Note that the Tower installation must be run from an internet connected machine that can install software from trusted 3rd-party places such as Ansible's software repository, and your OS vendor's software repositories. In some cases, access to the Python Package Index (PyPI) is necessary as well. If you need to be able to install in a disconnected environment and the bundled installation program is not a solution for you (refer to *Using the Bundled Tower Installation Program*), please contact Ansible via the Red Hat Customer portal at https://access.redhat.com/.

3.1 Notes for Red Hat Enterprise Linux and CentOS setups

- PackageKit can frequently interfere with the installation/update mechanism. Consider disabling or removing PackageKit if installed prior to running the setup process.
- Only the "targeted" SELinux policy is supported. The targeted policy can be set to disabled, permissive, or enforcing.
- When performing a bundled install (refer to *Using the Bundled Tower Installation Program* for more information), Red Hat Enterprise Linux customers must enable the following repositories which are disabled by default:
  - Red Hat Enterprise Linux 7 users must enable the `extras` repositories.

3.2 Configuration and Installation of Ansible with Red Hat Enterprise Linux and CentOS

The following steps help you configure access to the repository as well as install Ansible on older versions of Tower.

3.2.1 Configure Repository Access

Configure the EPEL repository and any others needed.

As the root user, for Red Hat Enterprise Linux 7 and CentOS 7

```
root@localhost:~$ yum install http://dl.fedoraproject.org/pub/epel/epel-release-
↪latest-7.noarch.rpm
```

Note:

- **You may also need to enable the `extras` repository specific for your environment:**
  - `extras` on CentOS 7
  - `rhel-7-server-extras-rpms` on Red Hat Enterprise Linux 7
  - `rhui-REGION-rhel-server-extras` when running in EC2.
- When using the official Red Hat Enterprise Linux 7 marketplace AMI, ensure that the latest `rh-amazon-rhui-client` package that allows enabling the optional repository (named `rhui-REGION-rhel-server-optional` in EC2) is installed.

3.2.2 Install Ansible

Note: Tower is installed using Ansible playbooks; therefore, Ansible is required to complete the installation of Tower.

Beginning with Ansible Tower version 2.3.0, Ansible is installed automatically during the setup process.

If you are using an older version of Tower, prior to version 2.3.0, Ansible can be installed as detailed in the Ansible documentation at: http://docs.ansible.com/intro_installation.html

For convenience, those installation instructions are summarized below.

```
root@localhost:~$ yum install ansible
```

3.3 Configuration and Installation of Ansible with Ubuntu

The following steps help you configure access to the repository as well as install Ansible on older versions of Tower.

3.3.1 Configure Repository Access

As the root user, configure Ansible PPA:

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

3.3.2 Install Ansible

Note: Tower is installed using Ansible playbooks; therefore, Ansible is required to complete the installation of Tower.

Beginning with Ansible Tower version 2.3.0, Ansible is installed automatically during the setup process.

If you are using an older version of Tower, prior to version 2.3.0, Ansible can be installed as detailed in the Ansible documentation at: http://docs.ansible.com/intro_installation.html

For convenience, those installation instructions are summarized below.

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

CHAPTER

FOUR

REQUIREMENTS

Note: Tower is a full application and the installation process installs several dependencies such as PostgreSQL, Django, NGINX, and others. It is required that you install Tower on a standalone VM or cloud instance and do not co-locate any other applications on that machine (beyond possible monitoring or logging software). 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 in this guide.

Ansible Tower has the following requirements:

- **Supported Operating Systems**:
  - Red Hat Enterprise Linux 7.2 or later 64-bit
  - CentOS 7.2 or later 64-bit
  - Ubuntu 14.04 LTS 64-bit
  - Ubuntu 16.04 LTS 64-bit

Note: Ansible Tower requires Red Hat Enterprise Linux 7.2 or later.

- **A currently supported version of Mozilla Firefox or Google Chrome**
  - Other HTML5 compliant web browsers may work but are not fully tested or supported.
- **2 GB RAM minimum** (*4+ GB RAM recommended*)
  - 2 GB RAM (minimum and recommended for Vagrant trial installations)
  - 4 GB RAM is recommended per 100 forks
- **20 GB of dedicated hard disk space**
  - 10 GB of the 20 GB requirement must be dedicated to `/var/`, where Tower stores its files and working directories (dedicating less space will cause the installation to fail)
- **64-bit support required** (kernel and runtime)
- **For Amazon EC2**:
  - Instance size of m3.medium or larger
  - An instance size of m3.xlarge or larger if there are more than 100 hosts
- **For System Tracking data storage**:

- If you plan to utilize Tower's system tracking, the following guidelines provide a rough estimate for the amount of space required. The basic calculation is:

```
(number of hosts in inventory) * (number of scans) *
((average module fact size) * (number of modules scanning)
/ 3)
```

- For example, assuming a schedule of 1 scan per day for a year:

  (hosts = 1,000) * (number of scans = 365) * ((average module fact size = 100 kb) * (number of modules = 4) / 3) = 48 GB

The default scan operation has the four (4) modules listed, but you can add your own. Depending on the kinds of modules and the size of the facts you are gathering, that size might be larger.

To help keep the size down, you can use a management job to purge old facts. Refer to Management Jobs in the *Ansible Tower Administration Guide* for more information

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Note: Ansible Tower 3.0 moved away from MongoDB in favor of using Postgres. The new Postgres data-type consumes about one-third (1/3) less space than the equivalent human-readable JSON with no whitespace or newlines. If you are using an older version of Ansible Tower, you should use the following example to determine how much space may be required:

(hosts = 1,000) * (number of scans = 365) * (average module fact size = 100 kb) * (number of modules = 4) = 146 GB

4.1 Additional Notes on Tower Requirements

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 via the Red Hat Customer portal at https://access.redhat.com/. Management of other operating systems (nodes) is documented by the Ansible project itself and allows for a wider list.

Actual RAM requirements 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 4 GB of memory per 100 forks. For example, if `forks` is set to 100, 4 GB of memory is recommended; if `forks` is set to 400, 16 GB 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 are 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 Ansible via the Red Hat Customer portal at https://access.redhat.com/.

The requirements for systems managed by Tower are the same as for Ansible at: http://docs.ansible.com/intro_getting_started.html

4.2 Ansible Software Requirements

While Ansible Tower depends on Ansible Playbooks and requires the installation of the latest stable version of Ansible before installing Tower, manual installations of Ansible are no longer required.

Beginning with Ansible Tower version 2.3, the Tower installation program attempts to install Ansible as part of the installation process. Previously, Tower required manual installations of the Ansible software release package before running the Tower installation program. Now, Tower attempts to install the latest stable Ansible release package.

If performing a bundled tower installation, the installation program attempts to install Ansible (and its dependencies) from the bundle for you (refer to *Using the Bundled Tower Installation Program* for more information).

If you choose to install Ansible on your own, the Tower installation program will detect that Ansible has been installed and will not attempt to reinstall it. Note that you must install Ansible using a package manager like `yum` and that the latest stable version must be installed for Ansible Tower to work properly.

CHAPTER

FIVE

OBTAINING THE TOWER INSTALLATION PROGRAM

Note: To obtain a trial version of Ansible Tower, visit: http://www.ansible.com/tower-trial

For pricing information, visit: http://www.ansible.com/pricing

To download the latest version of Tower directly (note, you must also obtain a license before using this), visit: https://releases.ansible.com/ansible-tower/setup/ansible-tower-setup-latest.tar.gz

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

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

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

5.1 Using Vagrant/Amazon AMI Images

One easy way to try Ansible Tower is to use a Vagrant box or an Amazon EC2 instance, and launching a trial of Ansible Tower just takes a few minutes.

If you use the Vagrant box or Amazon AMI Tower images provided by Ansible, you can find the auto-generated admin password by connecting to the image and reading it from the *message of the day* (MOTD) shown at login.

5.1.1 Vagrant

For Vagrant images, use the following commands to connect:

```
$ vagrant init ansible/tower
$ vagrant up --provider virtualbox
$ vagrant ssh
```

That last command provides your admin password and the Tower log-in URL. Upon login, you will receive directions on obtaining a trial license.

An up-to-date link to Ansible's Vagrant image is available from the LAUNCH TOWER IN VAGRANT section of Ansible's main website.

5.1.2 Amazon EC2

To launch the AMI, you must have an AMI ID (which varies based on you particular AWS region). A list of regions with links to AMI IDs is available in the LAUNCH TOWER IN AMAZON EC2 section of Ansible's main website.

For Amazon AMI images, use the following command to connect:

```
ssh root@<your amazon instance>
```

You must use the SSH key that you configured the instance to accept at launch time.

5.2 Using the Bundled Tower Installation Program

Beginning in Ansible Tower version 2.3.0, Tower installations can be performed using a bundled installation program. The bundled installation program is meant for customers who cannot, or would prefer not to, install Tower (and its dependencies) from online repositories. Access to Red Hat Enterprise Linux or Centos repositories is still needed.

To download the latest version of the bundled Tower installation program directly (note, you must also obtain a license before using this), visit: https://releases.ansible.com/ansible-tower/setup-bundle/

Note: The bundled installer only supports Red Hat Enterprise Linux and CentOS. Ubuntu support has not yet been added.

Next, select the installation program which matches your distribution (`el7`):

```
ansible-tower-setup-bundle-latest.el7.tar.gz
```

Note: Red Hat Enterprise Linux customers must enable the following repositories which are disabled by default:

- Red Hat Enterprise Linux 7 users must enable the `extras` repository.

A list of package dependencies from Red Hat Enterprise Linux repositories can be found in the `bundle/base_packages.txt` file inside the setup bundle. Depending on what minor version of Red Hat Enterprise Linux you are running, the version and release specified in that file may be slightly different than what is available in your configured repository.

CHAPTER

SIX

INSTALLING ANSIBLE TOWER

As Tower can be installed in various ways by choosing the best mode for your environment and making any necessary modifications to the inventory file.

6.1 Tower Installation Scenarios

Tower can be installed using one of the following scenarios:

Single Machine:

- **As an integrated installation:**
  - This is a single machine install of Tower - the web frontend, REST API backend, and database are all on a single machine. This is the standard installation of Tower. It also installs PostgreSQL from your OS vendor repository, and configures the Tower service to use that as its database.
- **With an external database (2 options available):**
  - Tower with remote DB configuration: This installs the Tower server on a single machine and configures it to talk to a remote instance of PostgreSQL 9.4.X as its database. This remote PostgreSQL can be a server you manage, or can be provided by a cloud service such as Amazon RDS.
  - Tower with a playbook install of a remote Postgres system: This installs the Tower server on a single machine and installs a remote Postgres database via the playbook installer (managed by Tower).

Note: 1). Tower will not configure replication or failover for the database that it uses, although Tower should work with any replication that you have. 2). The database server should be on the same network or in the same datacenter as the Tower server for performance reasons.

High Availability Multi-Machine Cluster:

Tower can be installed in a high availability cluster mode. In this mode, multiple tower nodes are installed and active. Any node can receive http requests and all nodes can execute jobs.

- **A Clustered Tower setup must be installed with an external database (2 options available):**
  - Tower with remote DB configuration: This installs the Tower server on a single machine and configures it to talk to a remote instance of PostgreSQL as its database. This remote PostgreSQL can be a server you manage, or can be provided by a cloud service such as Amazon RDS.
  - Tower with a playbook install of a remote Postgres system: This installs the Tower server on a single machine and installs a remote Postgres database via the playbook installer (managed by Tower).
- For more information on configuring a clustered setup, refer to Clustering.

Note: Running in a cluster setup requires any database that Tower uses to be external–Postgres must be installed on a machine that is not one of the primary or secondary tower nodes. When in a redundant setup, the remote Postgres version requirements is *PostgreSQL 9.4.X*.

6.2 Setting up the Inventory File

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

- The contents of the inventory file should be defined in `./inventory`, next to the `./setup.sh` installer playbook.
- For **installations and upgrades**: If you need to make use of external databases, you must ensure the database sections of your inventory file are properly setup. Edit this file and add your external database information before running the setup script.
- For **redundant installations**: If you are creating a redundant setup, you must replace `localhost` with the hostname or IP address of all instances. All nodes/instances must be able to reach any others using this hostname or address. In other words, you cannot use the `localhost ansible_connection: local` on one of the nodes *AND* all of the nodes should use the same format for the host names.

  Therefore, this will *not* work:

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

  Instead, use these formats:

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

  OR

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

  OR

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

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

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

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

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

`rabbitmq_password=''` <—- create a new password here (alpha-numeric with no special characters)

Example Inventory file

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

Example Single Node Inventory File

```
[tower]
localhost ansible_connection=local

[database]

[all:vars]
admin_password='password'

pg_host=''
pg_port=''

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

rabbitmq_port=5672
rabbitmq_vhost=tower
rabbitmq_username=tower
rabbitmq_password='password'
rabbitmq_cookie=rabbitmqcookie

# Needs to be true for fqdns and ip addresses
rabbitmq_use_long_name=false
# Needs to remain false if you are using localhost
```

Example Multi Node Cluster Inventory File

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

[database]
dbnode.example.com

[all:vars]
ansible_become=true

admin_password='password'

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

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

rabbitmq_port=5672
rabbitmq_vhost=tower
rabbitmq_username=tower
rabbitmq_password=tower
rabbitmq_cookie=rabbitmqcookie

# Needs to be true for fqdns and ip addresses
rabbitmq_use_long_name=true
```

Example Inventory file for an external existing database

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

[database]

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


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

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

Example Inventory file for external database which needs installation

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


[database]
database.example.com

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

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

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

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

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

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

6.3 The Setup Playbook

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

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

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

The setup script takes the following arguments:

- `-h` – Show this help message and exit
- `-i INVENTORY_FILE` – Path to Ansible inventory file (default: `inventory`)
- `-e EXTRA_VARS` – Set additional Ansible variables as key=value or YAML/JSON (i.e. `-e bundle_install=false` forces an online installation)
- `-b` – Perform a database backup in lieu of installing
- `-r` – Perform a database restore in lieu of installing (a default restore path is used unless EXTRA_VARS are provided with a non-default path, as shown in the code example below)

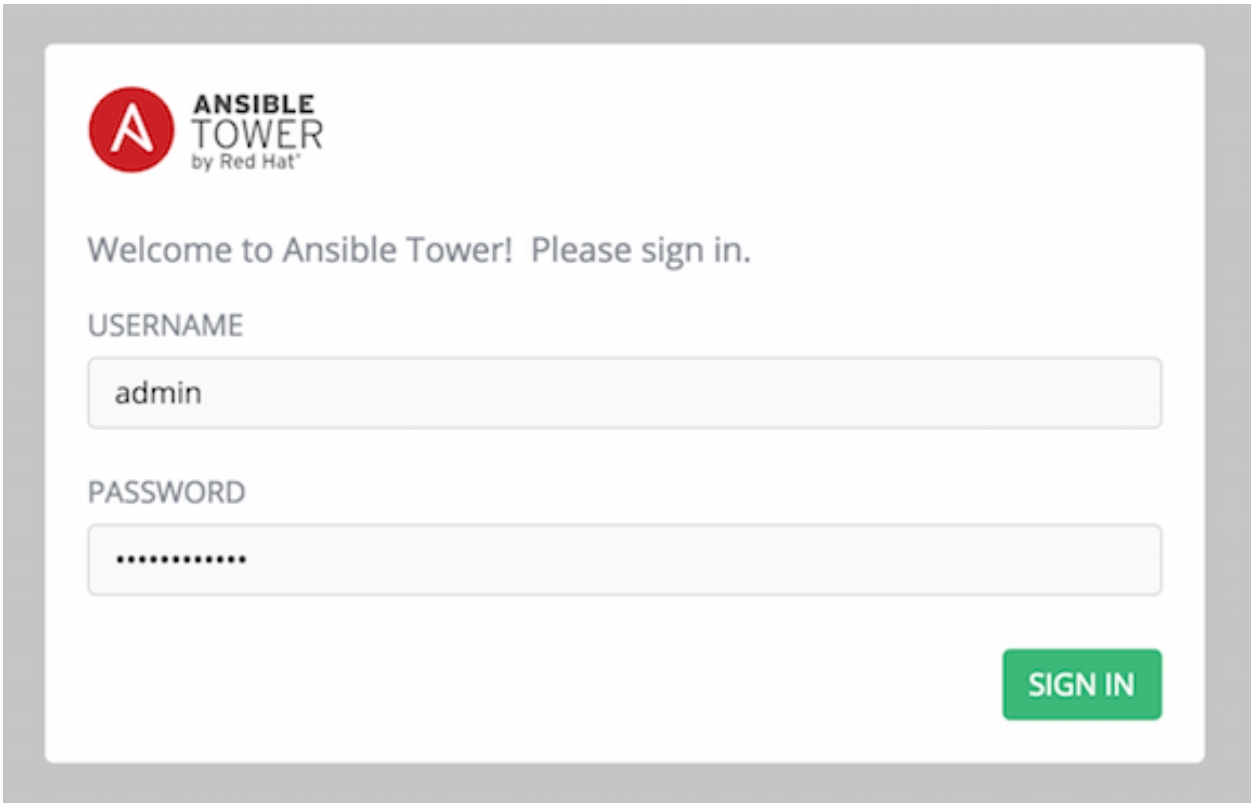
```
./setup.sh -e 'restore_backup_file=/path/to/nondefault/location' -r
```

Note: Please note that a issue was discovered in Tower 3.0.0 and 3.0.1 that prevented proper system backups and restorations.

If you need to back up or restore your Tower v3.0.0 or v3.0.1 installation, use the v3.0.2 installer to do so.

After calling `./setup.sh` with the appropriate parameters, Tower is installed on the appropriate machines as has been configured. Setup installs Tower from RPM or Deb packages using repositories hosted on **ansible.com**.

Once setup is complete, use your web browser to access the Tower server and view the Tower login screen. Your Tower server is accessible from port 80 (*http://tower.company.com/*) but will redirect to port 443 so 443 needs to be available also.



If the installation of Tower fails and you are a customer who has purchased a valid license for Ansible Tower, please contact Ansible via the Red Hat Customer portal at https://access.redhat.com/.

6.4 Changing the Password

Once installed, if you log into the Tower instance via SSH, the default admin password is provided in the prompt. You can then change it with the following command (as root or as AWX user):

```
tower-manage changepassword admin
```

After that, the password you have entered will work as the admin password in the web UI.

CHAPTER

SEVEN

UPGRADING AN EXISTING TOWER INSTALLATION

You can upgrade your existing Tower installation to the latest version easily. Tower looks for existing configuration files and recognizes when an upgrade should be performed instead of an upgrade.

As with installation, the upgrade process requires that the Tower server be able to access the Internet. The upgrade process takes roughly the same amount of time as a Tower installation, plus any time needed for data migration.

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

Note: You can not convert an embedded-database Tower to a Active/Passive Redundancy mode installation as part of an upgrade. Users who want to deploy Tower in a Redundant configuration should back up their Tower database, install a new Redundant configuration on a different VM or physical host, and then restore the database. It is possible to add a primary or secondary instance later on to Tower if it is already operating on an external database. Refer to the Active/Passive Redundancy chapter of the *Tower Administration Guide*.

7.1 Requirements

Before upgrading your Tower installation, refer to *Requirements* to ensure you have enough disk space and RAM as well as to review any software needs. For example, you should have the latest stable release of Ansible installed before performing an upgrade.

Note: If you are not yet using a 2.4.x version of Ansible Tower, **do not** attempt to upgrade directly to Ansible Tower 3.0. You must start with a system which has a verison of Tower 2.4.x installed or the upgrade will fail.

You must upgrade your Ansible Tower 2.4.4 (or later) system to Ansible Tower 3.0 before you can upgrade to Ansible Tower 3.1.0.

7.2 Backing Up Your Tower Installation

It is advised that you create a backup before upgrading the system. After the backup process has been accomplished, proceed with OS/Ansible/Tower upgrades.

Refer to Backing Up and Restoring Tower in the *Ansible Tower Administration Guide*.

Note: Please note that an issue was discovered in Tower 3.0.0 and 3.0.1 that prevented proper system backups and restorations.

If you need to backup or restore your Tower v3.0.0 or v3.0.1 installation, use the v3.0.2 installer to do so.

7.3 Get the Tower Installer

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

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

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

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 Ansible via the Red Hat Customer portal at https://access.redhat.com/.

7.4 The Setup Playbook

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

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

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

The setup script takes the following arguments:

- `-h` – Show this help message and exit
- `-i INVENTORY_FILE` – Path to Ansible inventory file (default: `inventory`)
- `-e EXTRA_VARS` – Set additional Ansible variables as key=value or YAML/JSON (i.e. `-e bundle_install=false` forces an online installation)
- `-b` – Perform a database backup in lieu of installing
- `-r` – Perform a database restore in lieu of installing (a default restore path is used unless EXTRA_VARS are provided with a non-default path, as shown in the code example below)

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

Note: Please note that a issue was discovered in Tower 3.0.0 and 3.0.1 that prevented proper system backups and restorations.

If you need to back up or restore your Tower v3.0.0 or v3.0.1 installation, use the v3.0.2 installer to do so.

CHAPTER

EIGHT

USABILITY ANALYTICS AND DATA COLLECTION

In Ansible Tower version 2.4.0, a behind the scenes functionality was added to Tower to collect usability data. This software was introduced to better understand how Tower users specifically interact with Tower, to help enhance future releases, and to continue streamlining your user experience.

Only users installing a trial of Tower or a fresh installation of Tower are opted-in for this data collection.

If you want to change how you participate in this analytics collection, you can opt out or change your settings using either the command line or the Tower user interface. For user interface instructions, refer to the Ansible Tower Administration Guide.

To opt out using the command line, navigate to the `/etc/tower/` directory and set the following in `settings.py`:

```
PENDO_TRACKING_STATE = 'off'
```

Once set, you must restart your instance of Tower using the `ansible-tower-service restart` command, re-authenticate, and force-reload your browser session.

To re-enable data collection, navigate to the `/etc/tower/` directory and set the following in `settings.py`:

```
PENDO_TRACKING_STATE = 'detailed'
```

Once set, you must restart your instance of Tower using the `ansible-tower-service restart` command, re-authenticate, and force-reload your browser session.

To enable data collection without your specific user data, navigate to the `/etc/tower/` directory and set the following in `settings.py`:

```
PENDO_TRACKING_STATE = 'anonymous'
```

Once set, you must restart your instance of Tower using the `ansible-tower-service restart` command, re-authenticate, and force-reload your browser session.

CHAPTER

NINE

GLOSSARY

Ad Hoc Refers to running Ansible to perform some quick command, using /usr/bin/ansible, rather than the orchestration language, which is /usr/bin/ansible-playbook. An example of an ad hoc command might be rebooting 50 machines in your infrastructure. Anything you can do ad hoc can be accomplished by writing a Playbook, and Playbooks can also glue lots of other operations together.

Callback Plugin Refers to some user-written code that can intercept results from Ansible and do something with them. Some supplied examples in the GitHub project perform custom logging, send email, or even play sound effects.

Check Mode Refers to running Ansible with the `--check` option, which does not make any changes on the remote systems, but only outputs the changes that might occur if the command ran without this flag. This is analogous to so-called "dry run" modes in other systems, though the user should be warned that this does not take into account unexpected command failures or cascade effects (which is true of similar modes in other systems). Use this to get an idea of what might happen, but it is not a substitute for a good staging environment.

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.

Facts Facts are simply things that are discovered about remote nodes. While they can be used in playbooks and templates just like variables, facts are things that are inferred, rather than set. Facts are automatically discovered when running plays by executing the internal setup module on the remote nodes. You never have to call the setup module explicitly, it just runs, but it can be disabled to save time if it is not needed. For the convenience of users who are switching from other configuration management systems, the fact module also pulls in facts from the 'ohai' and 'facter' tools if they are installed, which are fact libraries from Chef and Puppet, respectively.

Forks Ansible and Tower talk to remote nodes in parallel and the level of parallelism can be set serveral ways–during the creation or editing of a Job Template, by passing `--forks`, or by editing the default in a configuration file. The default is a very conservative 5 forks, though if you have a lot of RAM, you can easily set this to a value like 50 for increased parallelism.

Group A set of hosts in Ansible that can be addressed as a set, of which many may exist within a single Inventory.

Group Vars The `group_vars/` files are files that live in a directory alongside an inventory file, with an optional filename named after each group. This is a convenient place to put variables that will be provided to a given group, especially complex data structures, so that these variables do not have to be embedded in the inventory file or playbook.

Handlers Handlers are just like regular tasks in an Ansible playbook (see Tasks), but are only run if the Task contains a "notify" directive and also indicates that it changed something. For example, if a config file is changed then the task referencing the config file templating operation may notify a service restart handler. This means services can be bounced only if they need to be restarted. Handlers can be used for things other than service restarts, but service restarts are the most common usage.

Host A system managed by Tower, which may include a physical, virtual, cloud-based server, or other device. Typically an operating system instance. Hosts are contained in Inventory. Sometimes referred to as a "node".

Host Specifier Each Play in Ansible maps a series of tasks (which define the role, purpose, or orders of a system) to a set of systems. This "hosts:" directive in each play is often called the hosts specifier. It may select one system, many systems, one or more groups, or even some hosts that are in one group and explicitly not in another.

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

Inventory Script A very simple program (or a complicated one) that looks up hosts, group membership for hosts, and variable information from an external resource–whether that be a SQL database, a CMDB solution, or something like LDAP. This concept was adapted from Puppet (where it is called an "External Nodes Classifier") and works more or less exactly the same way.

Inventory Source Information about a cloud or other script that should be merged into the current inventory group, resulting in the automatic population of Groups, Hosts, and variables about those groups and hosts.

Job One of many background tasks launched by Tower, this is usually the instantiation of a Job Template; the launch of an Ansible playbook. Other types of jobs include inventory imports, project synchronizations from source control, or administrative cleanup actions.

Job Detail The history of running a particular job, including its output and success/failure status.

Job Template The combination of an Ansible playbook and the set of parameters required to launch it.

JSON Ansible and Tower use JSON for return data from remote modules. This allows modules to be written in any language, not just Python.

Notifier An instance of a notification type (Email, Slack, Webhook, etc.) with a name, description, and a defined configuration.

Notification A manifestation of the notifier; for example, when a job fails a notification is sent using the configuration defined by the notifier.

Notify The act of a task registering a change event and informing a handler task that another action needs to be run at the end of the play. If a handler is notified by multiple tasks, it will still be run only once. Handlers are run in the order they are listed, not in the order that they are notified.

Organization A logical collection of Users, Teams, Projects, and Inventories. The highest level in the Tower object hierarchy is the Organization.

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.

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.

Plays A playbook is a list of plays. A play is minimally a mapping between a set of hosts selected by a host specifier (usually chosen by groups, but sometimes by hostname globs) and the tasks which run on those hosts to define the role that those systems will perform. There can be one or many plays in a playbook.

Playbook An Ansible playbook. Refer to http://docs.ansible.com/ for more information.

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

Roles Roles are units of organization in Ansible and Tower. Assigning a role to a group of hosts (or a set of groups, or host patterns, etc.) implies that they should implement a specific behavior. A role may include applying certain variable values, certain tasks, and certain handlers–or just one or more of these things. Because of the file structure associated with a role, roles become redistributable units that allow you to share behavior among playbooks–or even with other users.

Schedule The calendar of dates and times for which a job should run automatically.

Sudo Ansible does not require root logins and, since it is daemonless, does not require root level daemons (which can be a security concern in sensitive environments). Ansible can log in and perform many operations wrapped

in a `sudo` command, and can work with both password-less and password-based sudo. Some operations that do not normally work with `sudo` (like `scp` file transfer) can be achieved with Ansible's *copy*, *template*, and *fetch* modules while running in `sudo` mode.

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.

Survey Questions asked by a job template at job launch time, configurable on the job template.

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.

User An Tower operator with associated permissions and credentials.

Workflow Job Template A set consisting of any combination of job templates, project syncs, and inventory syncs, linked together in order to execute them as a single unit.

YAML Ansible and Tower use YAML to define playbook configuration languages and also variable files. YAML has a minimum of syntax, is very clean, and is easy for people to skim. It is a good data format for configuration files and humans, but is also machine readable. YAML is fairly popular in the dynamic language community and the format has libraries available for serialization in many languages (Python, Perl, Ruby, etc.).

CHAPTER

TEN

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- genindex

CHAPTER

ELEVEN

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