Ansible Automation Platform Upgrade and Migration

Release Automation Controller 4.2.1

Red Hat, Inc.

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

Note: You must upgrade your automation controller to automation controller 3.8 before you can upgrade to automation controller 4.0.

We Need Feedback!

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

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

Automation Controller Version 4.2.1; September 12, 2022; https://access.redhat.com/

CHAPTER

ONE

RELEASE NOTES FOR AUTOMATION CONTROLLER VERSION 4.2.1

Automation Controller fixes:

- Node alias is now saved when job template is changed in the workflow
- Improved error messages in the API `job_explanation` field for specific error scenarios, (e.g., runner worker process is killed), or certain failure scenarios (e.g., shutdown)
- Fixed the Task Manager to fully account for the job's control process capacity for jobs running in container groups
- **Fixed a few bugs that caused delays in task processing by adding the following file-based settings:**
  - `JOB_WAITING_GRACE_PERIOD` increases the threshold for marking jobs stuck in the "waiting" status as failed
  - `CLUSTER_NODE_MISSED_HEARTBEAT_TOLERANCE` to allow the heartbeat to be more tolerant to clock skew and other problems
  - `K8S_POD_REAPER_GRACE_PERIOD` to allow more time before pod cleanup executes its last attempt to delete pods used by jobs
  - `TASK_MANAGER_TIMEOUT` to allow more time in the unlikely event that the Task Manager fails to finish normally
- Jobs no longer fail for nested submodules in an SCM (git) project and the `.git` folder will be omitted
- Added more logs to help debug database connectivity problems and cluster resource limits
- Removed the `current_user` cookie which was not used by the UI
- Updated controller to send FQCN data for tasks to analytics
- Fixed the metrics endpoint (`/api/v2/metrics`) to no longer produce erroneous `500` errors
- Added `remove_superuser` and `remove_system_auditors` to the SAML user attribute map
- Added the ability to allow multiple values in the `SOCIAL_AUTH_SAML_USER_FLAGS_BY_ATTR.is_*_[value|role]` settings
- Unwanted Galaxy credentials are no longer added to the Organization while logging in through SAML
- awx-cli now allows for multiple `--extra_vars` parameters
- Receptor no longer fails in FIPS mode
- If an OCP node's record is deleted (either by the `awx-manage` command or by the heartbeat task), it will re-register itself
- Upgrading and changing `node_type` from `execution` to `control` or `hybrid` no longer causes cleanup errors

Execution Environment fixes:

None for this release

Automation Controller UI fixes:

- The controller UI properly displays job output when `strategy: free` is set in the playbook
- Fixed the pagination displays within the main lists, i.e., Resources (Job Templates, Projects, Inventory), Access (Organization, Users, Teams, Notifications), and Administration (Instance Groups, Execution Environments)
- Fixed the Job Output to properly follow and scroll; and improved the Page Up/Page Down button behavior
- Fixed the controller UI to now be able to filter by multiple labels
- Large workflow templates no longer cause browsers to crash when linking nodes near the end of the template
- Fixed the approval node "Deny" to no longer run the subsequent workflow nodes
- Forks information no longer missing in running job details
- Upon saving a schedule, the date chooser no longer changes to the day before the selected date
- References to Ansible Tower are replaced with Automation Controller throughout the UI, including tooltips where documentation is referenced
- Corrected translations for the Japanese Subscription settings screen

Installation fixes specific to Automation Controller:

None for this release

CHAPTER

TWO

UPGRADING TO ANSIBLE AUTOMATION PLATFORM

Automation Hub acts as a content provider for automation controller, which requires both an automation controller deployment and an Automation Hub deployment running alongside each other. The Ansible Automation Platform installer contains both of these. This section covers each component of the upgrading process:

Note: All upgrades should be no more than two major versions behind what you are currently upgrading to. For example, in order to upgrade to automation controller 4.3, you must first be on version 4.1.x; i.e., there is no direct upgrade path from version 3.8.x or earlier. Refer to the recommended upgrade path article on the Red Hat customer portal.

In order to run automation controller 4.3, you must also have Ansible 2.12 at minimum.

To help you determine the right upgrade or migration path when moving from an old Ansible Automation Platform or Tower version to a new Ansible Automation Platform version, use the Upgrade Assistant at https://access.redhat.com/labs/aapua/. If prompted, use your Red Hat customer credentials to login.

2.1 Upgrade Planning

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

- Even if you already have a valid license from a previous version, you must still provide your credentials or a subscriptions manifest again upon upgrading to the latest automation controller. See Import a Subscription in the *Automation Controller User Guide*.
- If you need to upgrade Red Hat Enterprise Linux and automation controller, you will need to do a backup and restore of your controller data (from the automation controller). Refer to Backing Up and Restoring in the *Automation Controller Administration Guide* for further detail.
- Clustered upgrades require special attention to instance and instance groups prior to starting the upgrade. See Editing the Red Hat Ansible Automation Platform installer inventory file and Clustering for details.

2.2 Obtaining the Installer

Refer to Choosing and obtaining a Red Hat Ansible Automation Platform installer on the Red Hat Customer Portal for detail. Be sure to use your Red Hat customer login to access the full content.

2.3 Setting up the Inventory File

See Editing the Red Hat Ansible Automation Platform installer inventory file for information.

You can also automatically generate an inventory file based on your selections using a utility called the Inventory File Generator, which you can access at https://access.redhat.com/labs/aapifg/. If prompted, use your Red Hat customer credentials to login.

2.4 Running the Setup Playbook

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

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

The setup script takes the following arguments:

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

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

CHAPTER

THREE

UPGRADING TO EXECUTION ENVIRONMENTS

If upgrading from older versions of automation controller to 4.0 or later, the controller has the ability to detect previous versions of virtual environments associated with Organizations, Inventory, and Job Templates; and inform you that you will need to migrate to the new execution environment model. A brand new installation of automation controller creates two virtualenvs during installation–one is used to run the controller itself, while the other is used to run Ansible. Like legacy virtual environments, execution environments allow the controller to run in a stable environment, while allowing you to add or update modules to your execution environment as necessary to run your playbooks. For more information, see Execution Environments in the *Automation Controller User Guide*.

Important: When upgrading, it is highly recommended to always rebuild on top of the base execution environment that corresponds to the platform version you are using. See Building an Execution Environment for more information.

3.1 Migrate legacy venvs to execution environments

You can have the exact same setup in an execution environment that you had in a prior custom virtual environment by migrating them to the new execution environment. Use the `awx-manage` commands in this section to:

- list of all the current custom virtual environments and their paths (`list_custom_venvs`)
- view the resources that rely a particular custom virtual environment (`custom_venv_associations`)
- export a particular custom virtual environment to a format that can be used to migrate to an execution environment (`export_custom_venv`)

1. Before you migrate, it is recommended that you view all the custom virtual environments you currently have running by using the `awx-manage list` command:

```
$ awx-manage list_custom_venvs
```

Below is an example output when running this command:

```
bash-4.4$ awx-manage list_custom_venvs
# Discovered Virtual Environments:
/var/lib/awx/venv/i_heart_ansible
/var/lib/awx/venv/testing
/var/lib/awx/venv/new_env_better_name

- To export the contents of a (deprecated) virtual environment, run the followi
ng command while supplying the path as an argument:
awx-manage export_custom_venv /path/to/venv

- To view the connections a (deprecated) virtual environment had in the databas
e, run the following command while supplying the path as an argument:
awx-manage custom_venv_associations /path/to/venv

- Run these commands with `-q` to remove tool tips.
```

The above output shows three custom virtual environments and their paths. If you have a custom virtual environment that is not located within the default `/var/lib/awx/venv/` directory path, it will not be included here.

2. Use the `_associations` command to view what organizations, jobs, and inventory sources a custom virtual environment is associated with in order to determine which resources rely on them:

```
$ awx-manage custom_venv_associations /this/is/the/path/
```

Below is an example output when running this command:

```
bash-4.4$ awx-manage custom_venv_associations /var/lib/awx/venv/new_env_better_name
# Virtual Environments Associations:
inventory_sources:
- id: 15
  name: celery
job_templates:
- id: 9
  name: Demo Job Template @ 2:40:47 PM
- id: 13
  name: elephant
organizations:
- id: 3
  name: alternating_bongo_meow
- id: 1
  name: Default
projects: []

- To list all (now deprecated) custom virtual environments run:
awx-manage list_custom_venvs

- To export the contents of a (deprecated) virtual environment, run the following command while supplying the path as an argument:
awx-manage export_custom_venv /path/to/venv

- Run these commands with `-q` to remove tool tips.
```

3. Select a path for the virtual environment that you want to migrate and specify it in the `awx-manage export` command:

```
$ awx-manage export_custom_venv /this/is/the/path/
```

The resulting output is essentially the results of executing a `pip freeze` command. The example shows the contents of the selected custom virtual environment:

```
bash-4.4$ awx-manage export_custom_venv /var/lib/awx/venv/new_env_better_name
# Virtual environment contents:
ansible==2.9.0
cffi==1.14.5
cryptography==3.4.7
Jinja2==3.0.1
MarkupSafe==2.0.1
numpy==1.20.2
pandas==1.2.4
psutil==5.8.0
pycparser==2.20
python-dateutil==2.8.1
pytz==2021.1
PyYAML==5.4.1
six==1.16.0

- To list all (now deprecated) custom virtual environments run:
awx-manage list_custom_venvs

- To view the connections a (deprecated) virtual environment had in the database, run the following command whil
e supplying the path as an argument:
awx-manage custom_venv_associations /path/to/venv

- Run these commands with `-q` to remove tool tips.

bash-4.4$
```

Note: All of these commands can be run with a `-q` option, which removes the instructional content provided on each output.

Now that you have the output from this `pip freeze` data, you can paste it into a definition file that can be used to spin up your new execution environment using ansible-builder. Anyone (both normal users and admins) can use ansible-builder to create an execution environment. See Building an Execution Environment in the *Automation Controller User Guide* for further detail.

3.2 Migrate isolated instances to execution nodes

The move from isolated instance groups to execution nodes enables inbound or outbound connections. Contrast this with versions 3.8 and older where only outbound connections were allowed from controller nodes to isolated nodes.

Migrating legacy isolated instance groups to execution nodes in order to function properly in the automation controller mesh architecture in 4.1, is a preflight function of the installer that essentially creates an inventory file based on your old file. Even though both .ini and .yml files are still accepted formats, the generated file output is only an .ini file at this time.

The preflight check leverages Ansible; and Ansible flattens the concept of children, this means that not every single inventory file can be replicated exactly, but it is very close. It will be functionally the same to Ansible, but may look different to you. The automated preflight processing does its best to create child relationships based on heuristics, but be aware that the tool lacks the nuance and judgment that human users have. Therefore, once the file is created, do **NOT** use it as-is. Check the file over and use it as a template to ensure that they work well for both you and the Ansible engine.

Here is an example of a before and after preflight check, demonstrating how Ansible flattens an inventory file and how the installer reconstructs a new inventory file. To Ansible, both of these files are essentially the same.

Old style (from Ansible docs)

```
[tower]
localhost ansible_connection=local
[database]
[all:vars]
admin_password='******'
pg_host=''
pg_port=''
pg_database='awx'
pg_username='awx'
pg_password='******'
rabbitmq_port=5672
rabbitmq_vhost=tower
rabbitmq_username=tower
rabbitmq_password='******'
rabbitmq_cookie=cookiemonster
# Needs to be true for fqdns and ip␣
↪addresses
rabbitmq_use_long_name=false

[isolated_group_restrictedzone]
isolated-node.c.towertest-188910.internal

[isolated_group_restrictedzone:vars]
controller=tower
```

New style (generated by installer)

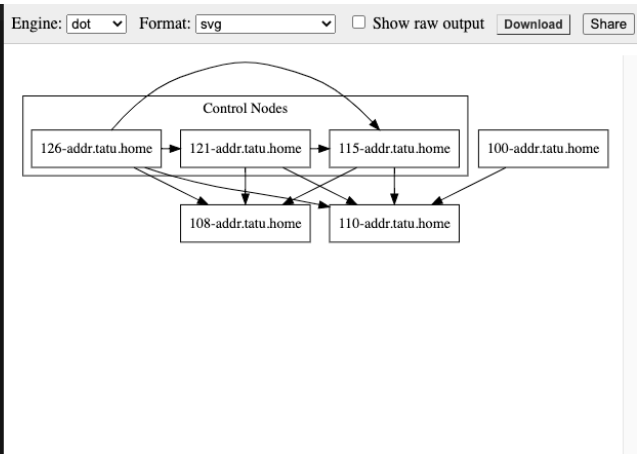
```
[all:vars]
admin_password='******'
pg_host=''
pg_port=''
pg_database='awx'
pg_username='awx'
pg_password='******'
rabbitmq_port=5672
rabbitmq_vhost='tower'
rabbitmq_username='tower'
rabbitmq_password='******'
rabbitmq_cookie='cookiemonster'
rabbitmq_use_long_name='false'
# In AAP 2.X [tower] has been renamed to␣
↪[automationcontroller]
# Nodes in [automationcontroller] will␣
↪be hybrid by default, capable of␣
↪executing user jobs.
# To specify that any of these nodes␣
↪should be control-only instead, give␣
↪them a host var of `node_type=control`
[automationcontroller]
localhost
[automationcontroller:vars]
# in AAP 2.X the controller variable has␣
↪been replaced with `peers`
# which allows finer grained control␣
↪over node communication.
# `peers` can be set on individual hosts,
↪ to a combination of multiple groups␣
↪and hosts.
peers='instance_group_restrictedzone'
ansible_connection='local'
# in AAP 2.X isolated groups are no␣
↪longer a special type, and should be␣
↪renamed to be instance groups
[instance_group_restrictedzone]
isolated-node.c.towertest-188910.internal
[instance_group_restrictedzone:vars]
# in AAP 2.X Isolated Nodes are␣
↪converted into Execution Nodes using␣
↪node_state=iso_migrate
node_state='iso_migrate'
# In AAP 2.X Execution Nodes have␣
↪replaced isolated nodes. All of these␣
↪nodes will be by default
# `node_type=execution`. You can specify␣
↪new nodes that cannot execute jobs and␣
↪are intermediaries
# between your control and execution␣
↪nodes by adding them to [execution_
↪nodes] and setting a host var
# `node_type=hop` on them.
[execution_nodes]
[execution_nodes:children]
instance_group_restrictedzone
```

3.3 View mesh topology

If you configured a mesh topology, the installer can graphically validate your mesh configuration through a generated graph rendering tool. The graph is generated by reading the contents of the inventory file. See the Red Hat Ansible Automation Platform automation mesh guide for further detail.

```
strict digraph "" {
    rankdir = TB
    node [shape=box];
    subgraph cluster_0 {
        graph [label="Control Nodes", type=solid];
        {
            rank = same;
            "126-addr.tatu.home";
            "121-addr.tatu.home";
            "115-addr.tatu.home";
            "126-addr.tatu.home" -> "115-addr.tatu.home";
            "126-addr.tatu.home" -> "121-addr.tatu.home";
            "121-addr.tatu.home" -> "115-addr.tatu.home";
        }
    }

    "108-addr.tatu.home";
    "110-addr.tatu.home";
    "100-addr.tatu.home";
    "126-addr.tatu.home" -> "108-addr.tatu.home";
    "126-addr.tatu.home" -> "110-addr.tatu.home";
    "121-addr.tatu.home" -> "108-addr.tatu.home";
    "121-addr.tatu.home" -> "110-addr.tatu.home";
    "115-addr.tatu.home" -> "108-addr.tatu.home";
    "115-addr.tatu.home" -> "110-addr.tatu.home";
    "100-addr.tatu.home" -> "110-addr.tatu.home";
}
```



Any given inventory file must include some sort of execution capacity that is governed by at least one control node. That is, it is unacceptable to produce an inventory file that only contains control-only nodes, execution-only nodes or hop-only nodes. There is a tightly coupled relationship between control and execution nodes that must be respected at all times. The installer will fail if the inventory files aren't properly defined. The only exception to this rule would be a single hybrid node, as it will satisfy the control and execution constraints.

In order to run jobs on an execution node, either the installer needs to pre-register the node, or user needs to make a PATCH request to `/api/v2/instances/N/` to change the enabled field to true.

If you have already deployed a mesh topology and want to view node type, node health, and specific details about each node, see Topology Viewer in the *Automation Controller Administration Guide*.

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CHAPTER

FIVE

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