Ansible Automation

TEKsystems Global Services

WORKFORCE DEVELOPMENT

DEBUGGING ANSIBLE

DEBUGGING ANSIBLE

Ansible offers a task debugger so you can fix errors during execution instead of editing your playbook and running it again to see if your change worked.

You have access to all the features of the debugger in the context of the task. You can check or set the value of variables, update module arguments, and re-run the task with the new variables and arguments.

The debugger lets you resolve the cause of the failure and continue with playbook execution.

DEBUGGING ANSIBLE

For performance reasons, the debugger is not enabled by default. It must be enabled before playbook execution.

To enable the debugger:

Enable in configuration file:

```
[defaults]
enable_task_debugger = True
```

Enable using environment variable:

```
ANSIBLE_ENABLE_TASK_DEBUGGER=True ansible-playbook playbook.yml
```

DEBUGGING ANSIBLE

The debugger can be enabled/disabled at the task, block, role, or play level. This is especially useful when developing or extending playbooks, plays, and roles.

You can enable the debugger on new or updated tasks. If they fail, you can fix the errors efficiently.

DEBUGGING ANSIBLE

The `debugger` keyword accepts five values.

Invoke the debugger:

- always:
  - Always, regardless of the outcome
- never:
  - Never, regardless of the outcome
- on_failed:
  - Only if a task fails
- on_unreachable:
  - Only if a host is unreachable
- on_skipped:
  - Only if the task is skipped

DEBUGGING ANSIBLE

Examples of using the `debugger` keyword (task)

```
tasks:
  - name: Execute a command
    command: "false"
    debugger: on_failed
```

Examples of using the `debugger` keyword (play)

```
- name: My play
  hosts: all
  debugger: on_skipped
  tasks:
    - name: Execute a command
      command: "true"
      when: False
```

DEBUGGING ANSIBLE

Examples of setting the `debugger` keyword at multiple levels

```
- name: Play
  hosts: all
  debugger: never
  tasks:
    - name: Execute a command
      command: "false"
      debugger: on_failed
```

In this example, the debugger is set to `never` at the play level and to `on_failed` at the task level. If the task fails, Ansible invokes the debugger, because the definition on the task overrides the definition on its parent play.

DEBUGGER COMMANDS

Command	Shortcut	Action
print	p	Print information
task.args[*key*] = *value*	N/A	Update module arguments
task_vars[key] = *value*	N/A	Update task variables (you must `update_task` next)
update_task	u	Recreate a task with updated task variables
redo	r	Run the task again
continue	c	Continue executing, starting with the new task
quit	q	Quit the debugger

DEBUGGING ANSIBLE

After Ansible invokes the debugger, use the commands to resolve the error that Ansible encountered.

Consider this example playbook, which defines the `var1` variable but uses the undefined `wrong_var` variable in a task by mistake.

```
- hosts: test
  debugger: on_failed
  vars:
    var1: value1
  tasks:
    - name: Use wrong variable
      ping: data={{ wrong_var }}
```

DEBUGGING ANSIBLE

If you run this playbook, Ansible invokes the debugger when the task fails.

From the debug prompt, you can change the module arguments or variables and run task again.

```
PLAY ***************************************************************************

TASK [wrong variable] **********************************************************
fatal: [192.0.2.10]: FAILED! => {"failed": true, "msg": "ERROR! 'wrong_var' is undefined"}
Debugger invoked
[192.0.2.10] TASK: wrong variable (debug)> p result._result
{'failed': True,
 'msg': 'The task includes an option with an undefined variable. The error '
        "was: 'wrong_var' is undefined\n"
        '\n'
        'The error appears to have been in '
        "'playbooks/debugger.yml': line 7, "
        'column 7, but may\n'
        'be elsewhere in the file depending on the exact syntax problem.\n'
        '\n'
        'The offending line appears to be:\n'
        '\n'
        ' tasks:\n'
        '   - name: wrong variable\n'
        '     ^ here\n'}
```

POP QUIZ: DEBUGGING

What is the next step?

A) Print task arguments
B) Change variable name
C) Change variable value
D) Rerun task?

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DEBUGGING ANSIBLE

Update variable value, and rerun task

```
PLAY ***************************************************************************
...

[192.0.2.10] TASK: wrong variable (debug)> p task.args
{u'data': u'{{ wrong_var }}'}
[192.0.2.10] TASK: wrong variable (debug)> task.args['data'] = '{{ var1 }}'
[192.0.2.10] TASK: wrong variable (debug)> p task.args
{u'data': '{{ var1 }}'}
[192.0.2.10] TASK: wrong variable (debug)> redo
ok: [192.0.2.10]

PLAY RECAP *********************************************************************
192.0.2.10 : ok=1 changed=0 unreachable=0 failed=0
```

DEBUGGING ANSIBLE

Print command: prints information about the task

```
[192.0.2.10] TASK: install package (debug)> p task
TASK: install package
[192.0.2.10] TASK: install package (debug)> p task.args
{u'name': u'{{ pkg_name }}'}
[192.0.2.10] TASK: install package (debug)> p task_vars
{u'ansible_all_ipv4_addresses': [u'192.0.2.10'],
 u'ansible_architecture': u'x86_64',
...
}
[192.0.2.10] TASK: install package (debug)> p task_vars['pkg_name']
u'bash'
[192.0.2.10] TASK: install package (debug)> p host
192.0.2.10
[192.0.2.10] TASK: install package (debug)> p result._result
{'_ansible_no_log': False,
 'changed': False,
  u'failed': True,
  ...
  u'msg': u"No package matching 'not_exist' is available"}
```

DEBUGGING ANSIBLE

Update args:

```
- hosts: test
  strategy: debug
  vars:
    pkg_name: not_exist
  tasks:
    - name: Install a package
      win_chocolatey: name={{ pkg_name }}
```

DEBUGGING ANSIBLE

When you run the playbook, the invalid package name triggers an error.
You can fix the package name by viewing, then updating the module argument.

```
[192.0.2.10] TASK: install package (debug)> p task.args
{u'name': u'{{ pkg_name }}'}
[192.0.2.10] TASK: install package (debug)> task.args['name'] = 'bash'
[192.0.2.10] TASK: install package (debug)> p task.args
{u'name': 'bash'}
[192.0.2.10] TASK: install package (debug)> redo
```

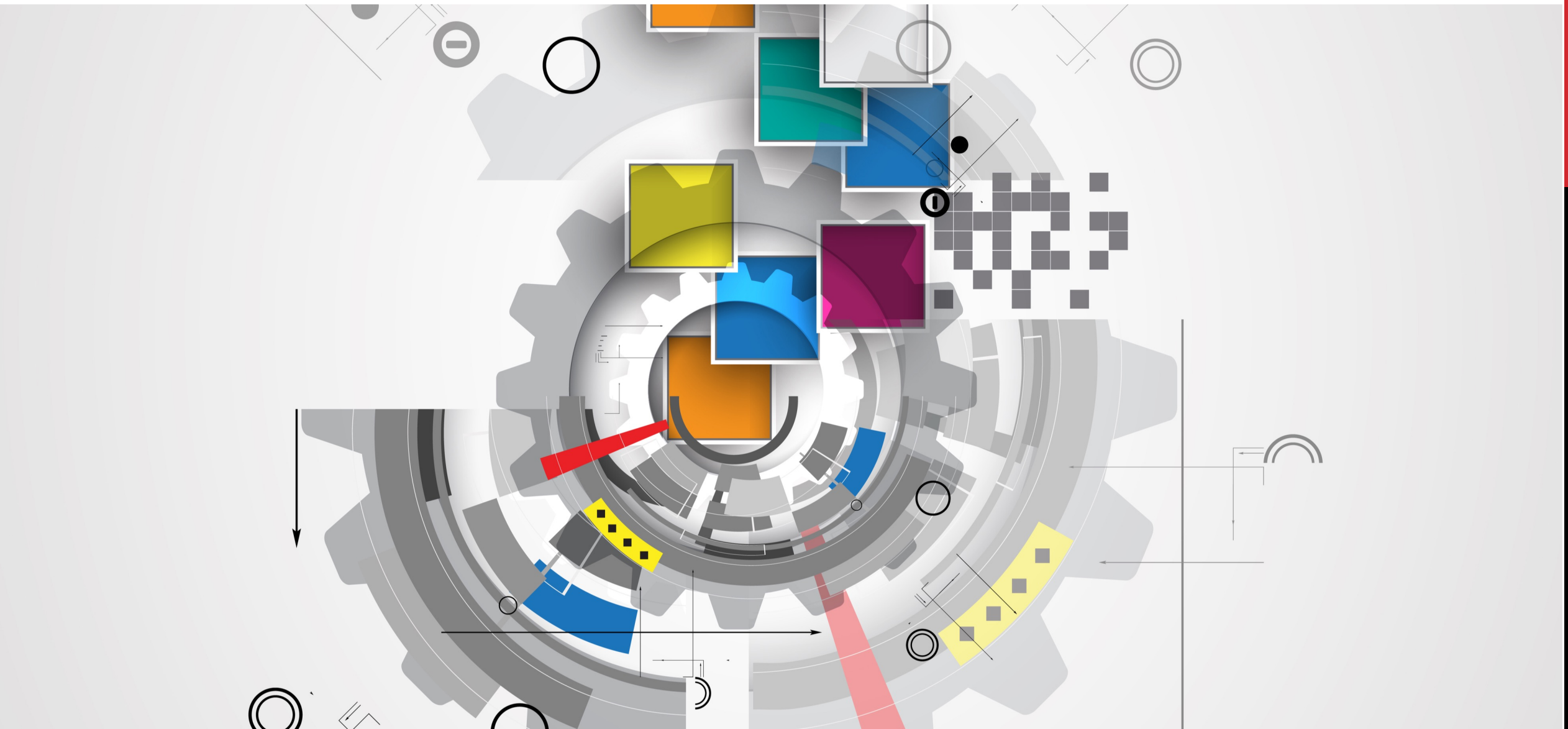
DEBUGGING ANSIBLE

You can also fix the playbook by viewing, then updating the task variables instead of module args.

```
[192.0.2.10] TASK: install package (debug)> p task_vars['pkg_name']
'not_exist'
[192.0.2.10] TASK: install package (debug)> task.vars['pkg_name'] = 'bash'
[192.0.2.10] TASK: install package (debug)> p task_vars['pkg_name']
'bash'
[192.0.2.10] TASK: install package (debug)> update_task
[192.0.2.10] TASK: install package (debug)> redo
```

After updating task variables, you MUST use `update_task` to load the new variables before running the task again with `redo`

CONTROLLING WHERE TASKS RUN



CONTROLLING WHERE TASKS RUN

By default, Ansible gathers facts and executes all tasks on the machines defined in your playbook.

There are times where delegating tasks, facts etc. to a different machine or group is required.

For example, when updating your webservers, you might need to remove them from a load-balanced pool temporarily.

By delegating the task to localhost, you keep all the tasks within the same play.

CONTROLLING WHERE TASKS RUN

There are some tasks that can not be delegated:

- `Include`
- `add_host`
- `debug`

DELEGATING TASKS

If you want to perform a task on one host with reference to other hosts, use the `delegate_to` keyword on a task.
This is ideal for managing nodes in a load balanced pool or for controlling outage windows.

```
- hosts: webservers
  serial: 5
  tasks:
    - name: Remove from LB Pool
      command: remove {{ inventory_hostname }}
      delegate_to: 127.0.0.1

    - name: Steps for maintenance
      win_package:
        path: C:\fileshare\app.msi
        state: present

 - name: Add to LB Pool
      command: add {{ inventory_hostname }}
      delegate_to: 127.0.0.1
```

DELEGATING TASKS

You can also combine `delegate_to` and `command`:

```
- hosts: webservers
  serial: 5
  tasks:
    - name: Remove from LB Pool
      local_action: command remove {{ inventory_hostname }}

    - name: Steps for maintenance
      win_package:
        path: C:\fileshare\app.msi
        state: present

 - name: Add to LB Pool
      local_action: command add {{ inventory_hostname }}
```

POP QUIZ: DISCUSSION

What other uses for `delegate_to` can you think of?

POP QUIZ: DISCUSSION

What other uses for `delegate_to` can you think of?

- Remove from monitoring
- Send notification (slack, teams, email, Pagerduty)
- Confirm dependent service is online (DB, MQ, Caching)

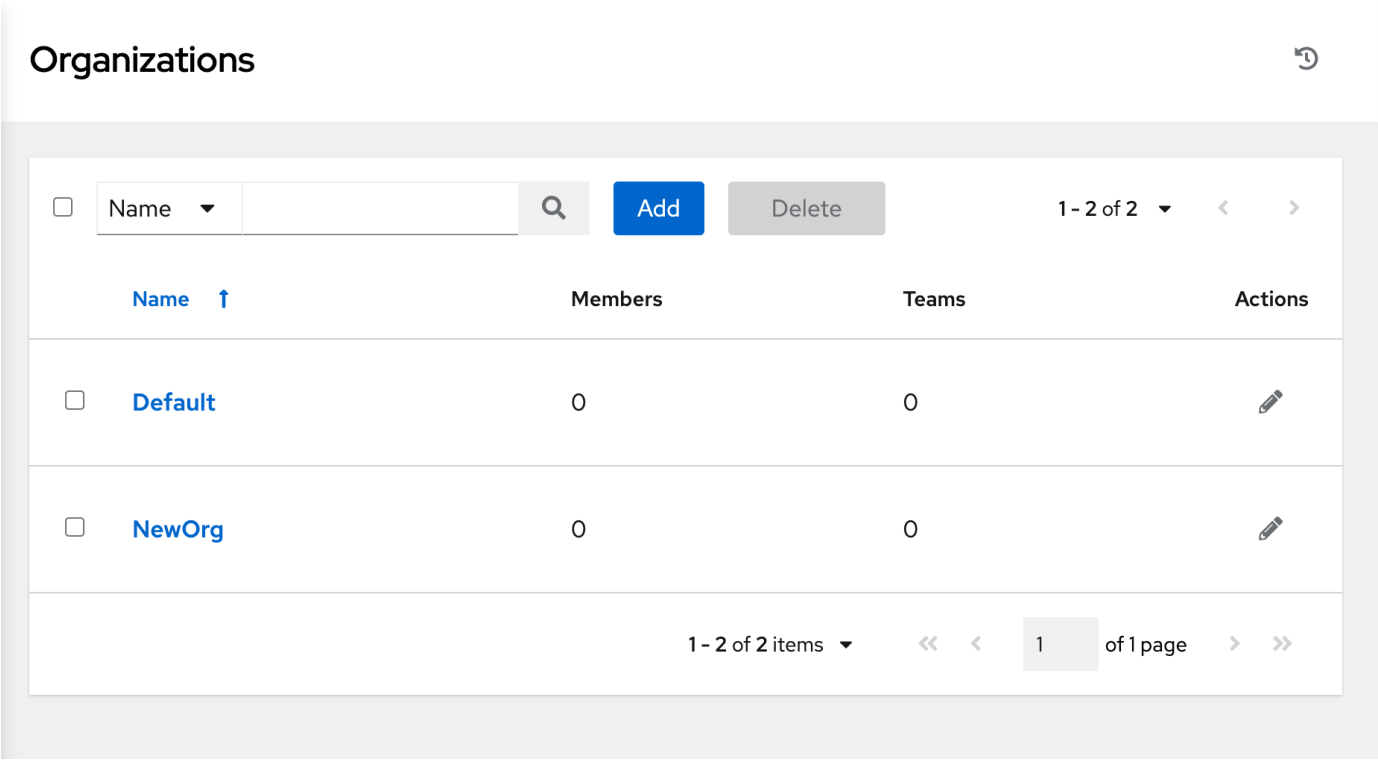
DELEGATING TASKS

You can specify additional arguments with the following syntax:

```
tasks:
  - name: Send email
    local_action:
      module: community.general.mail
      subject: "Summary Mail"
      to: "{{ mail_receipient }}"
      body: "{{ mail_body }}"
    run_once: True
```

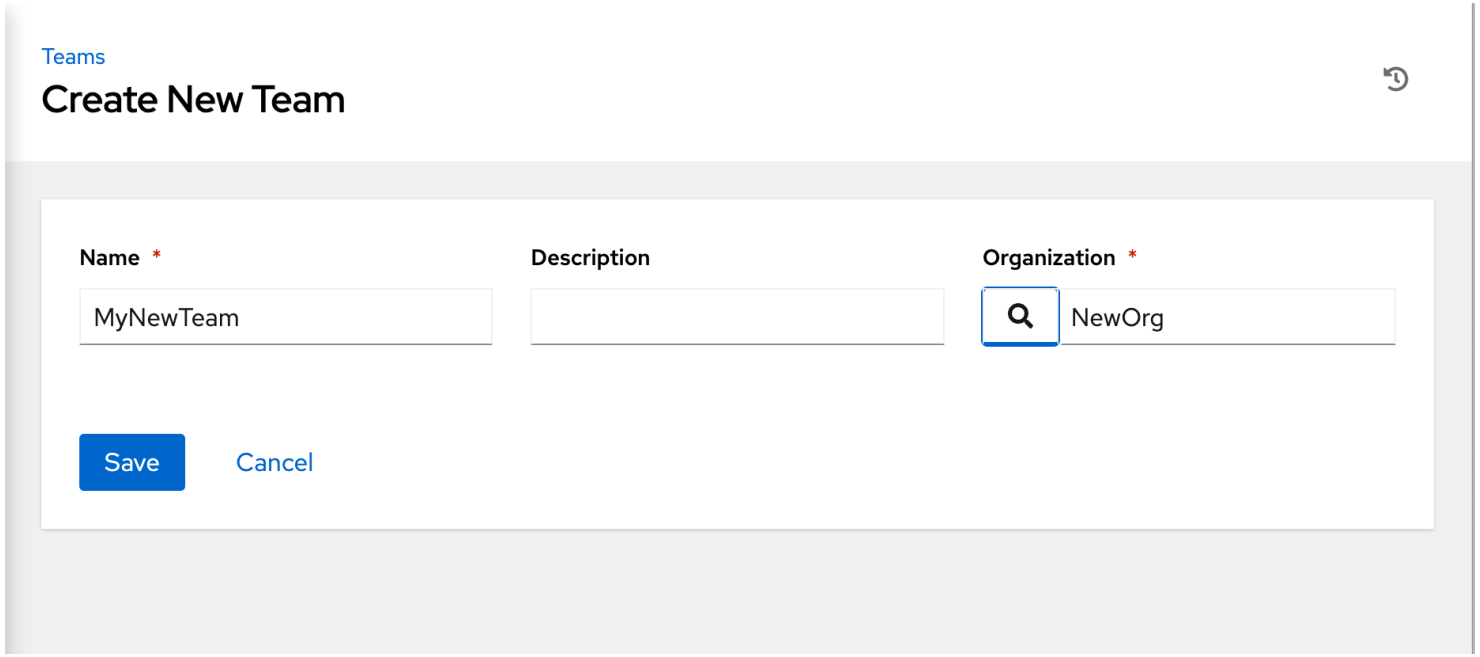
Organization

- Newly created users inherit specific roles from their organization based on their user type.
- Assign additional roles to a user after creation to grant permissions to view, use, or change other Ansible Platform objects.



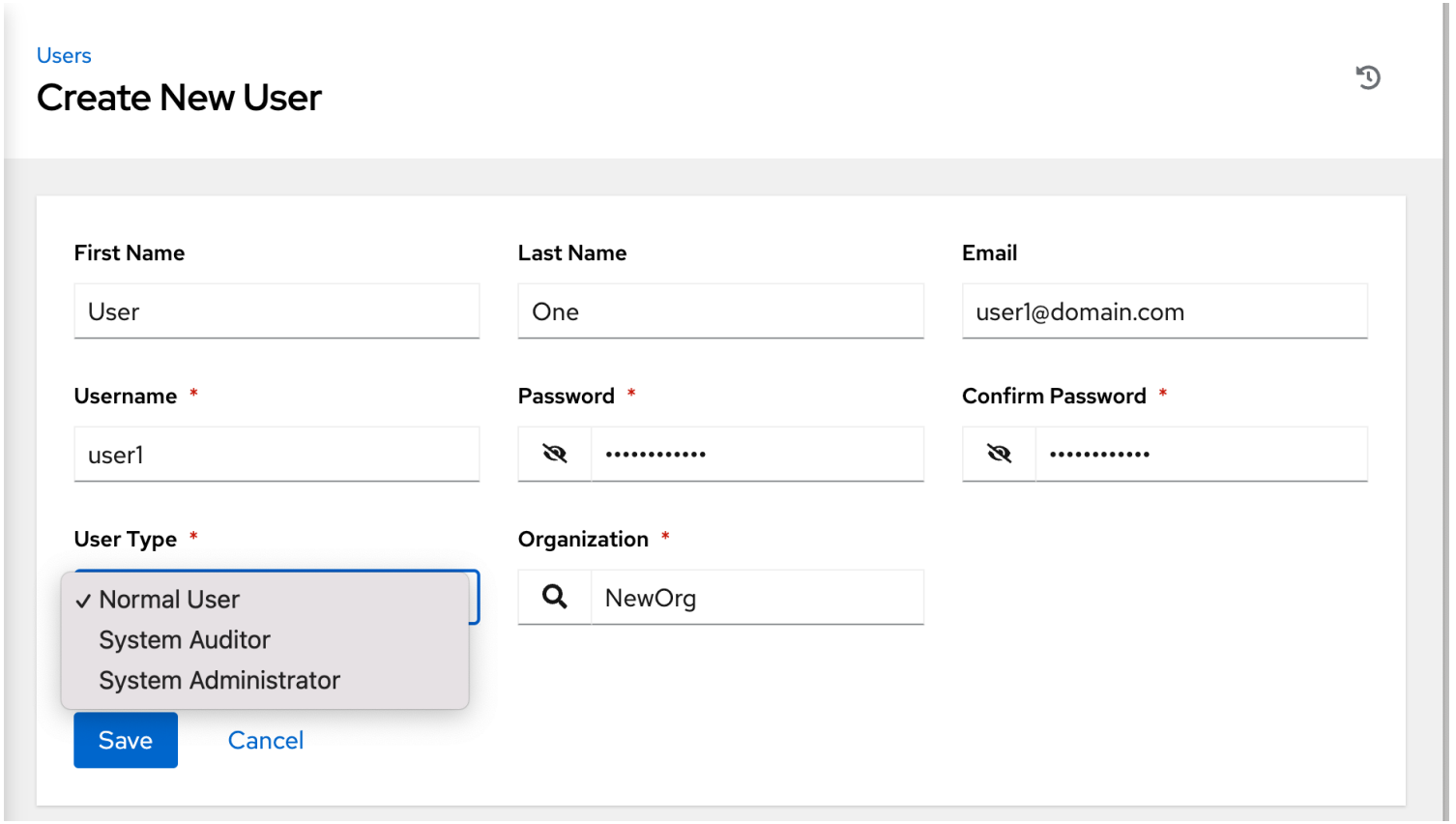
Team

- You can apply permissions at the team level.



User Roles

- An organization is also one of these objects.
- There are three roles that users can be assigned:
- Admin
- Auditor
- User



User Management

- An **organization** is a logical collection of users, teams, projects, inventories and more. All entities belong to an organization.
- A **user** is an account to access Ansible Automation Controller and its services given the permissions granted to it.
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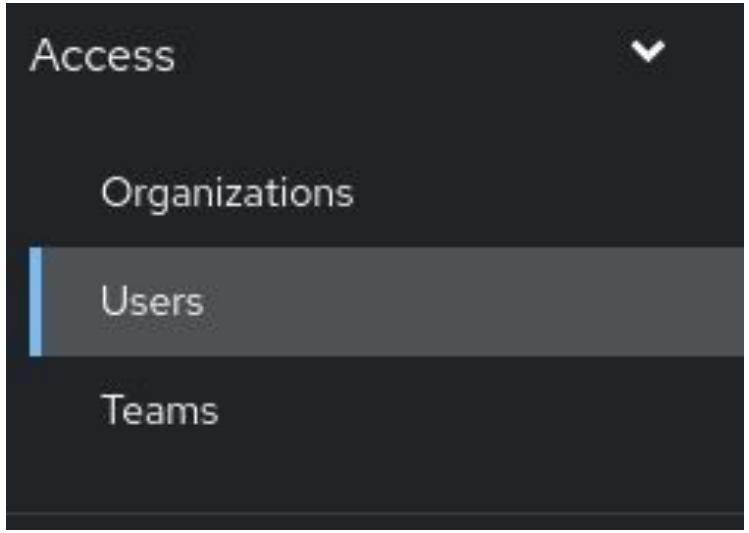

Inventory Roles

Role	Description
Admin	The inventory **Admin** role grants users full permissions over an inventory. These permissions include deletion and modification of the inventory. In addition, this role also grants permissions associated with the inventory roles **Use**, **Ad Hoc**, and **Update**.
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Credentials

Credentials are utilized by Automation Controller for authentication with various external resources:

- Connecting to remote machines to run jobs
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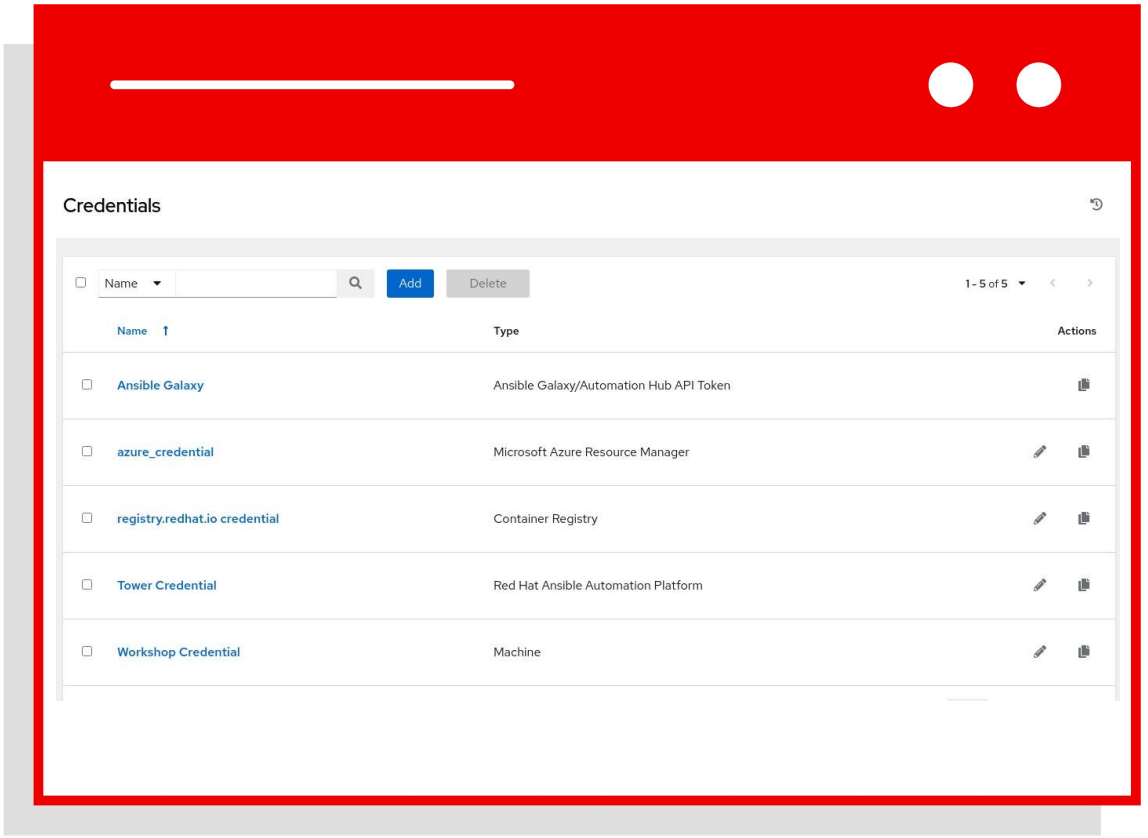
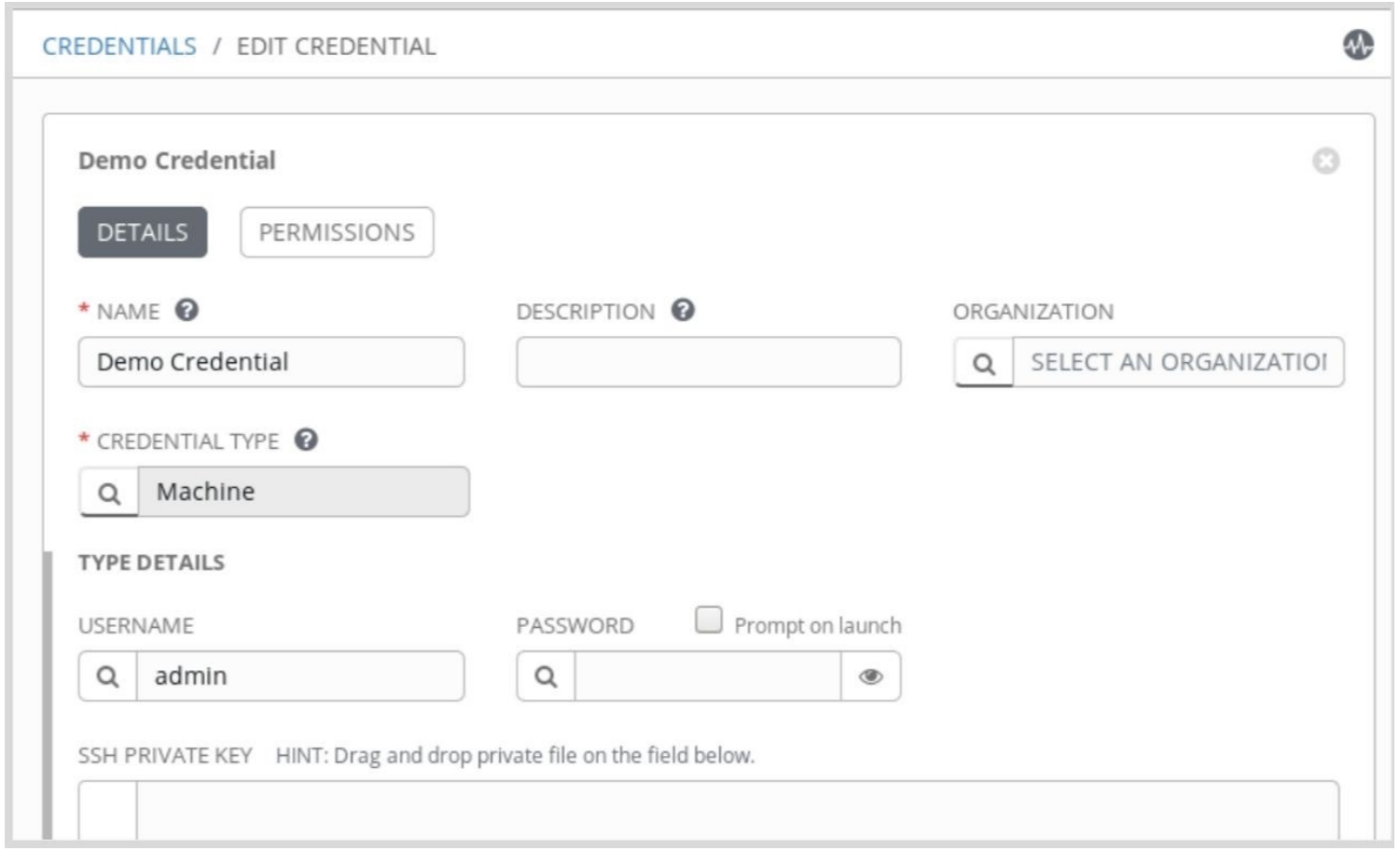
Centralized management of various credentials allows end users to leverage a secret without ever exposing that secret to them.



Credentials

- Create credentials in the UI
- This credential contains information that is used to access managed hosts in the **Inventory**.



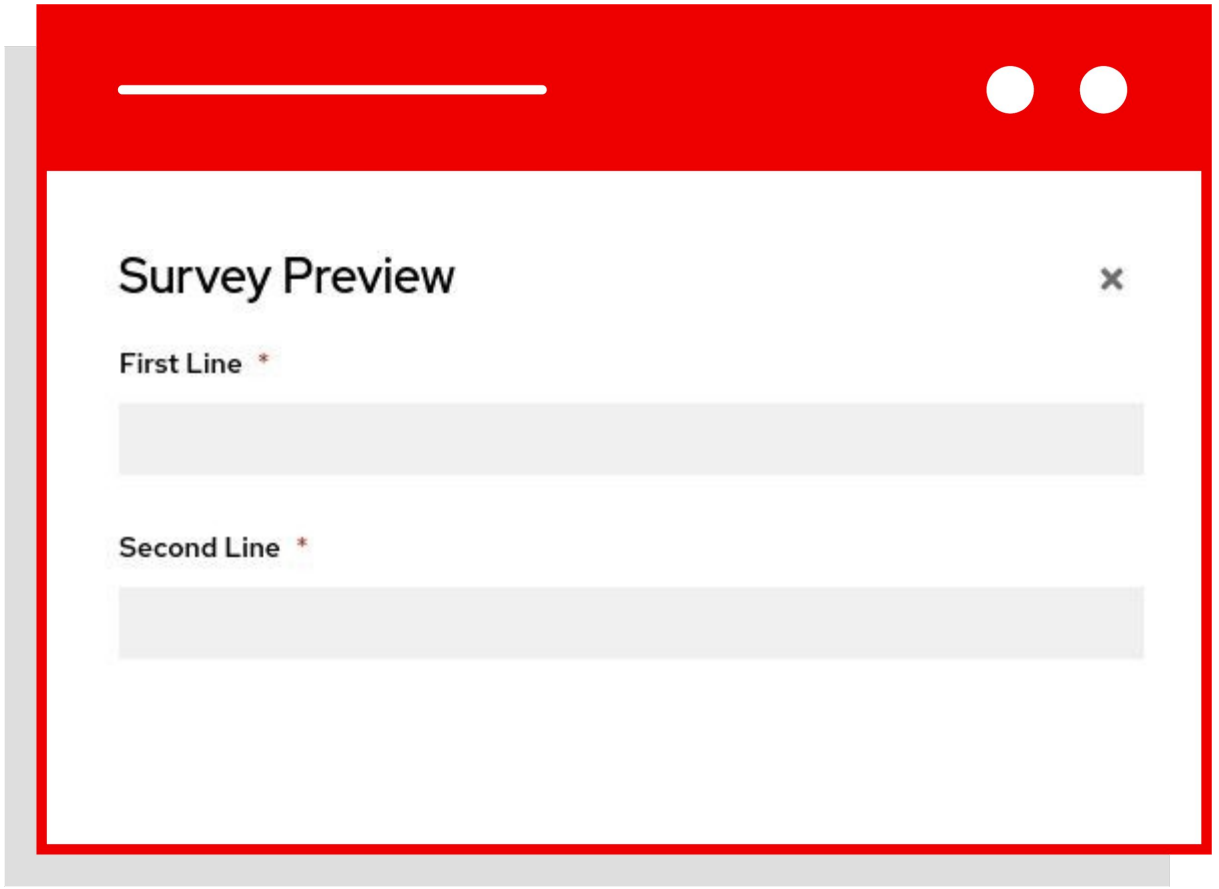
Ansible Surveys

SURVEYS

Controller surveys allow you to configure how a job runs via a series of questions, making it simple to customize your jobs in a user-friendly way.

An Ansible Controller survey is a simple question-and-answer form that allows users to customize their job runs.

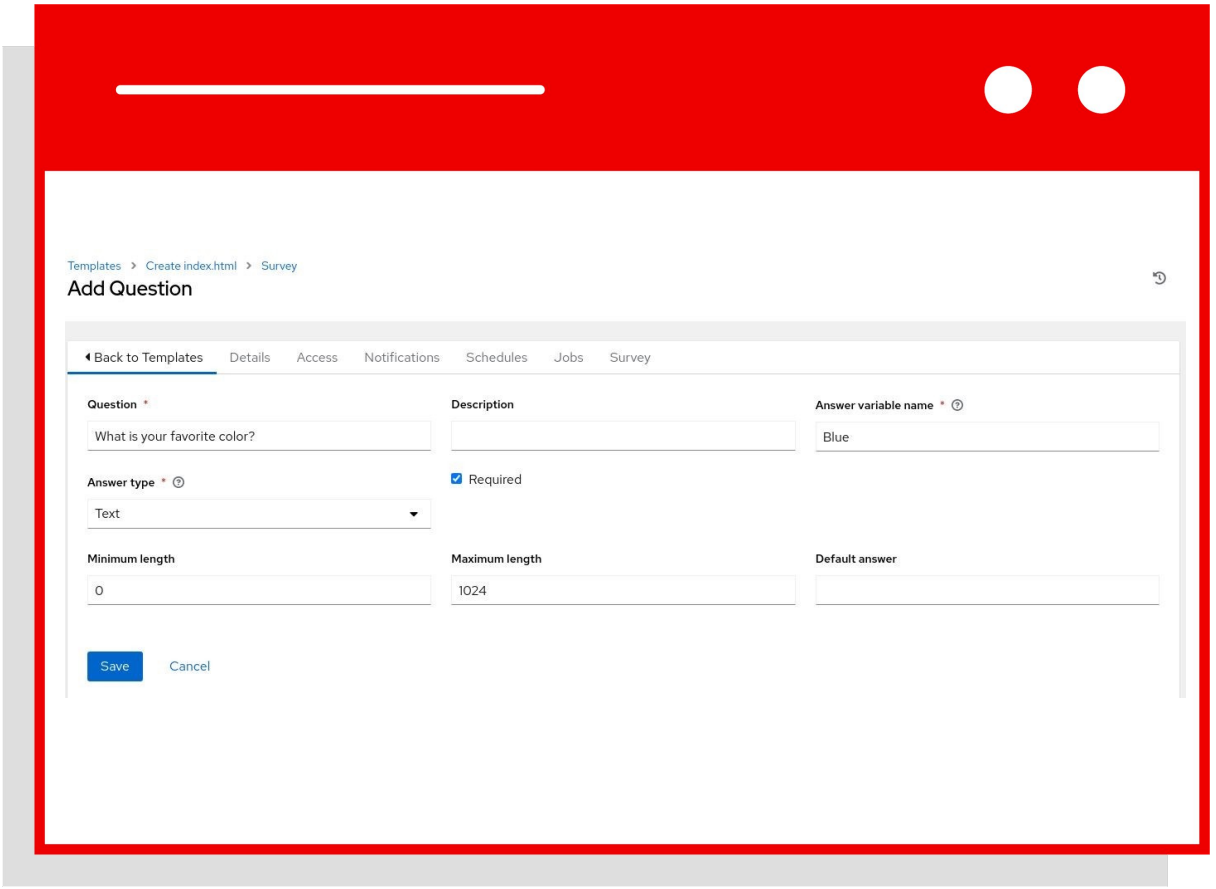
Combine that with Controller's role-based access control, and you can build simple, easy self-service for your users.



CREATING A SURVEY (1/2)

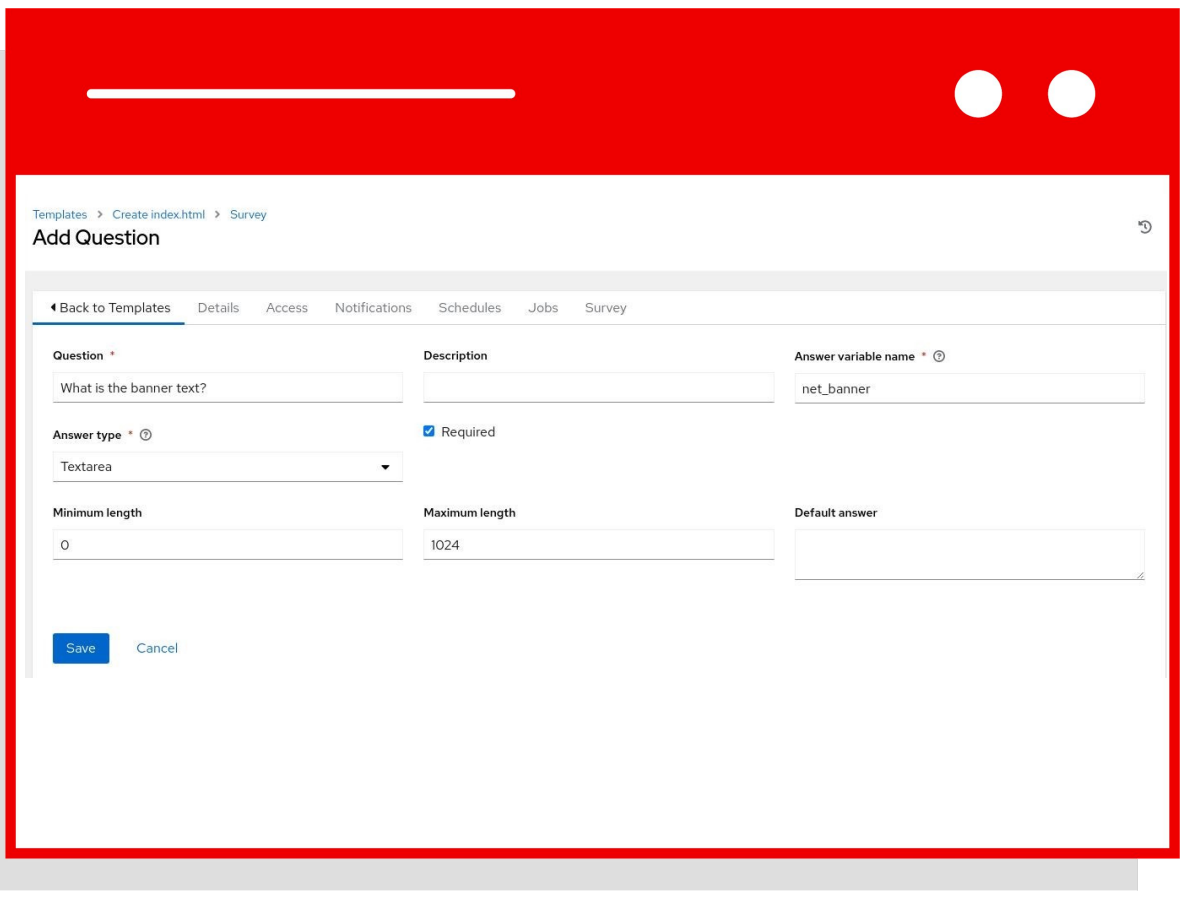
Once a Job Template is saved, the Survey menu will have an **Add Button**

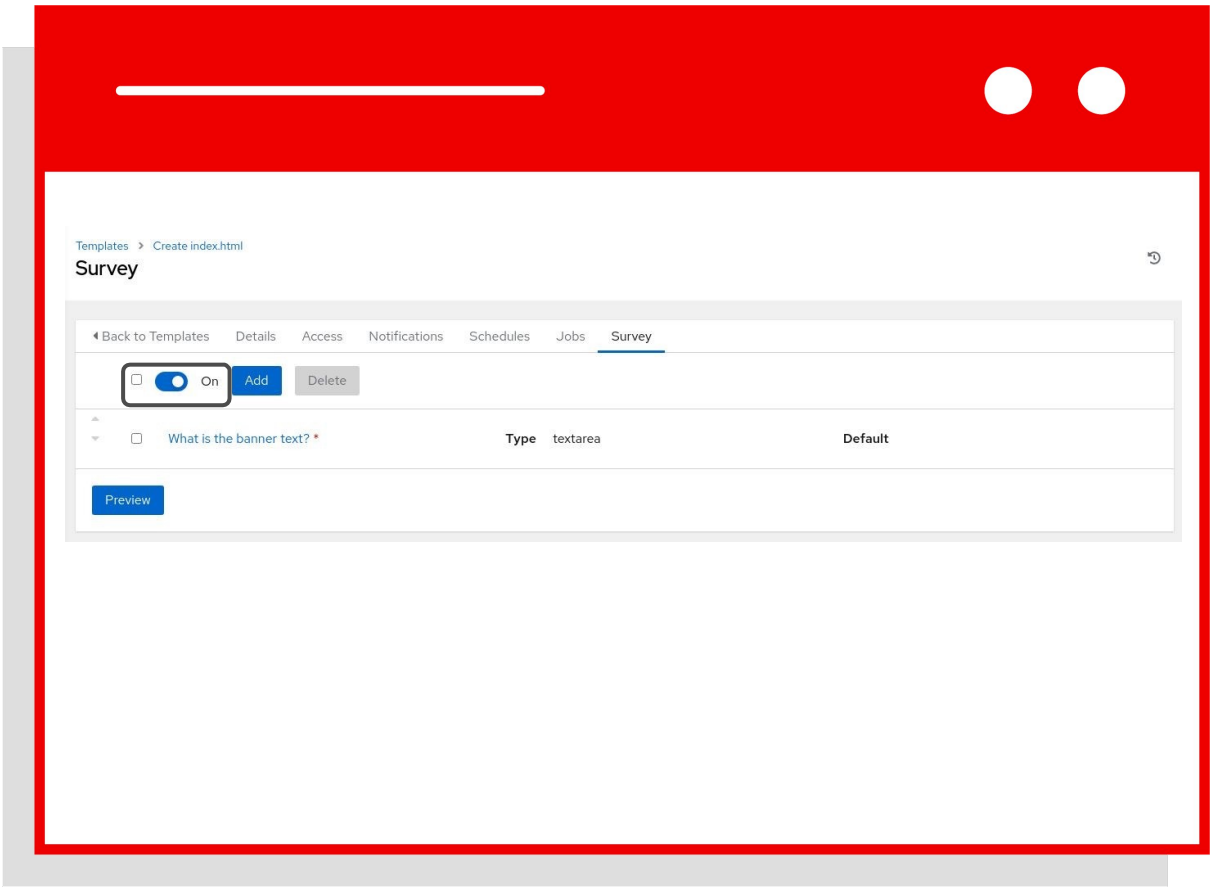
Click the button to open the Add Survey window.



CREATING A SURVEY (2/2)

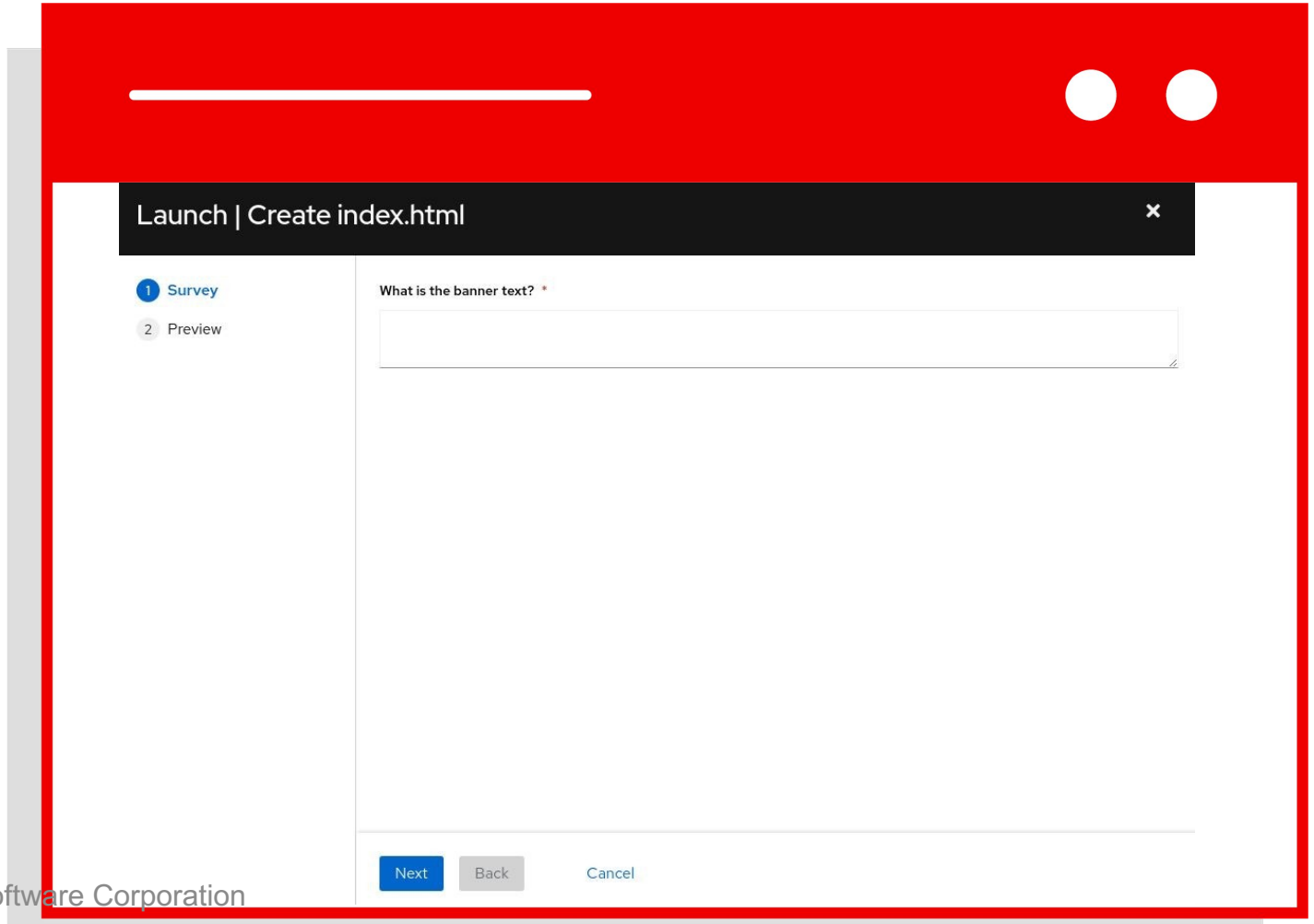
The Add Survey window allows the Job Template to prompt users for one or more questions. The answers provided become variables for use in the Ansible Playbook.





USING A SURVEY

When launching a job, the user will now be prompted with the Survey. The user can be required to fill out the Survey before the Job Template will execute.



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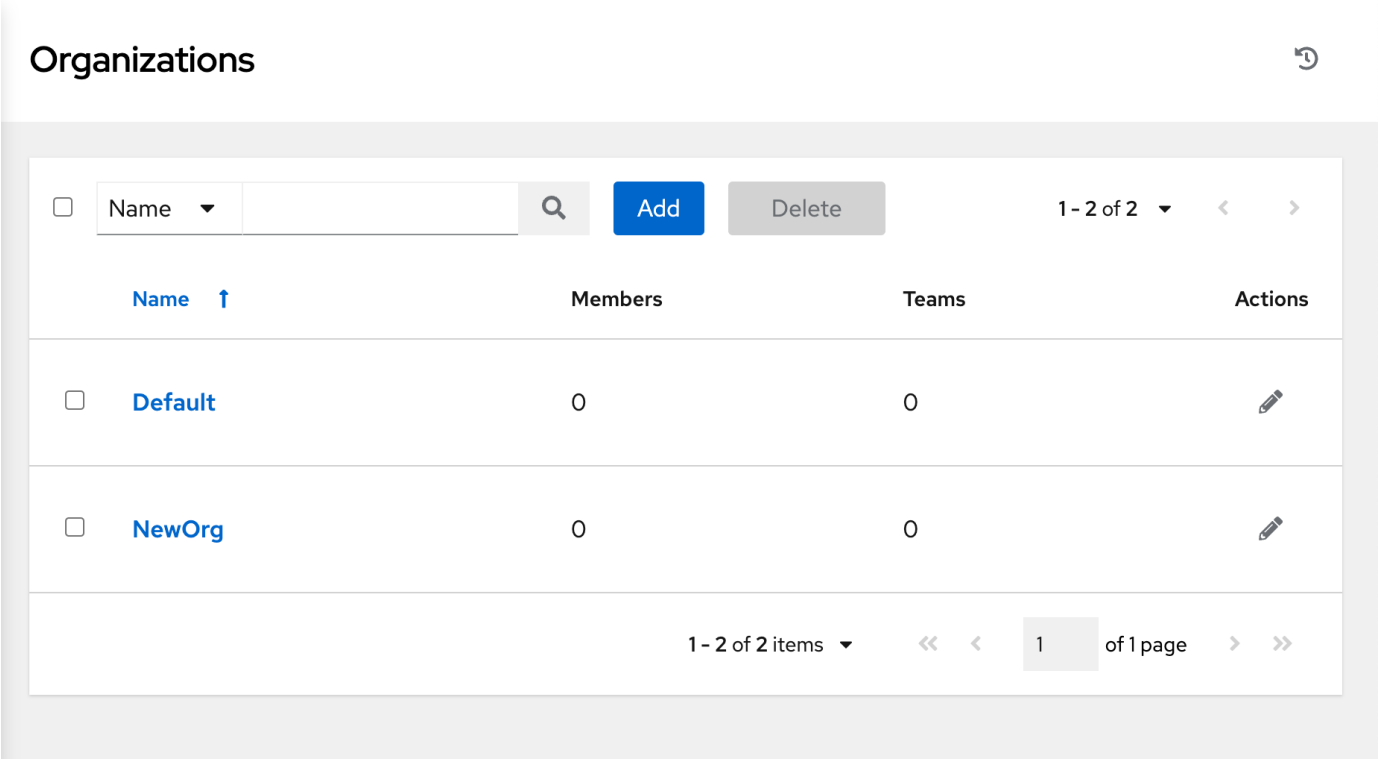

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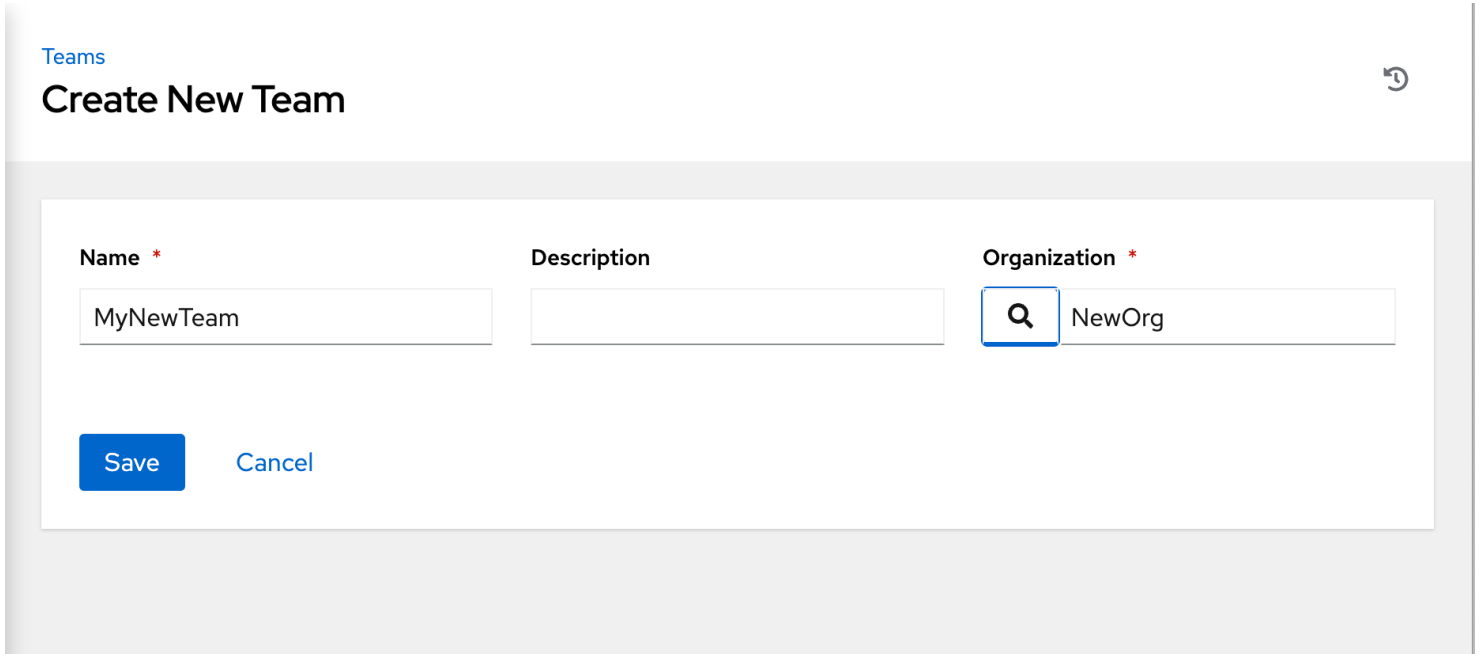

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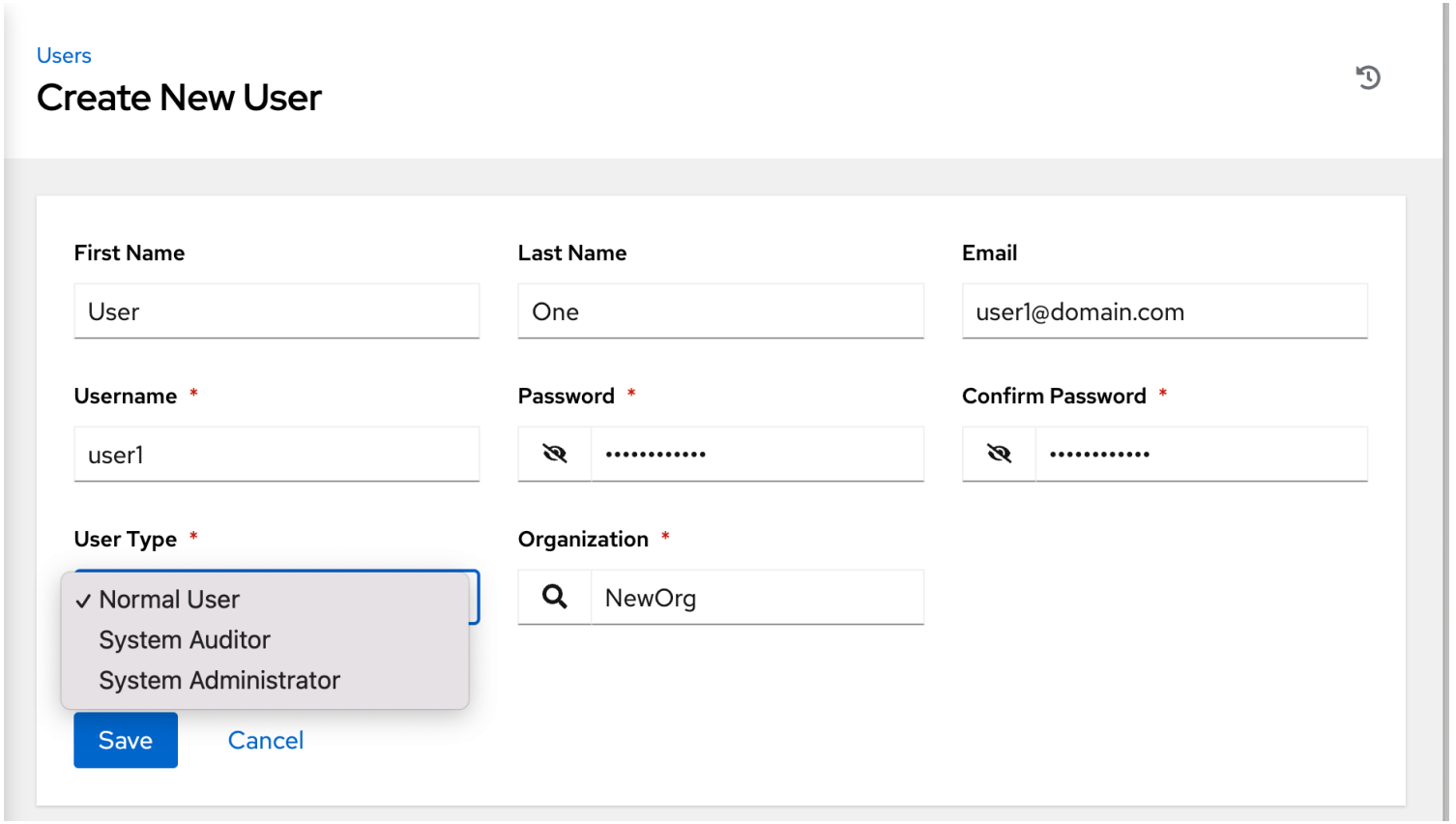

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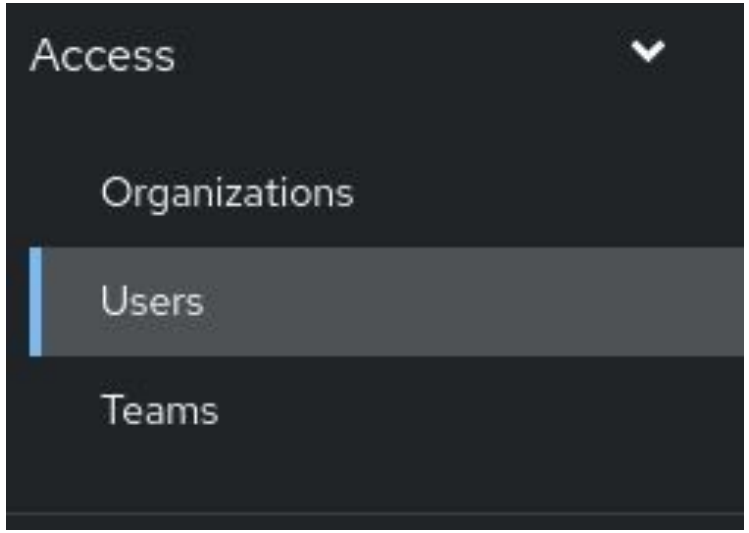

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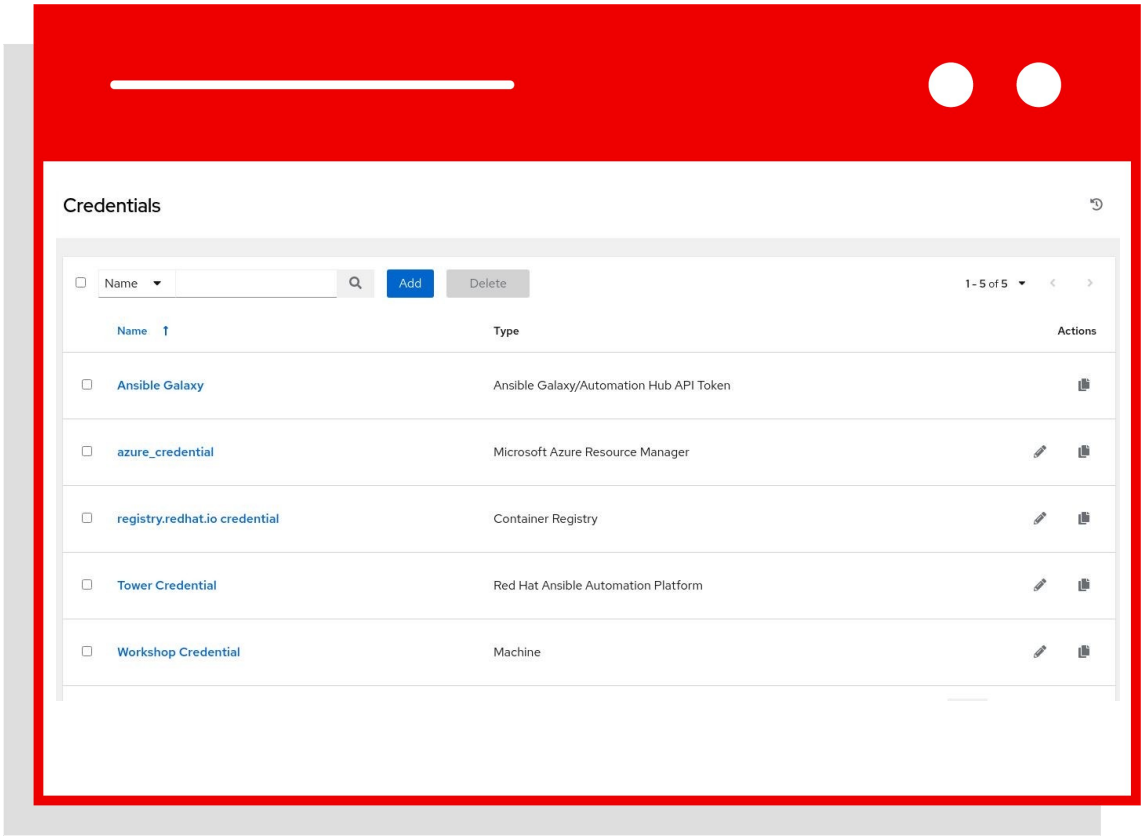

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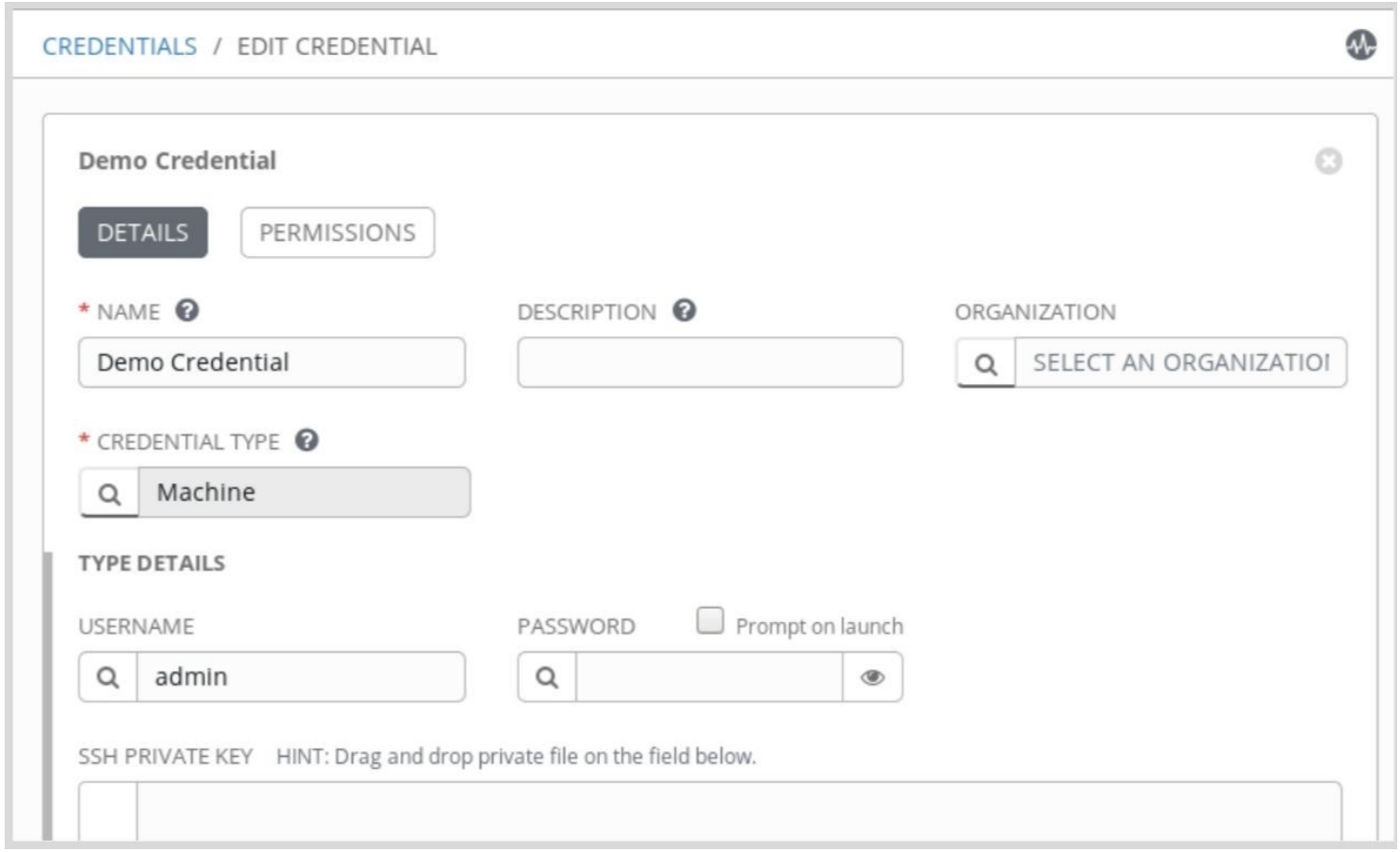

Ansible RBAC