



FOREMAN

Ansible Integration in Foreman

End to End automation for the Enterprise

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Agenda

What we're going to cover (quickly)

1. Foreman and prerequisites for ansible
2. Deploying and using ansible roles
3. Ansible Rex Templates
4. AWX
 - a. Dynamic inventory
 - b. Provisioning callbacks
5. Foreman-ansible-modules



Foreman

Managing the Lifecycle of your Systems



Provisioning



Configuration



Monitoring



Ansible and Foreman

Simplest way to automate apps and IT infrastructure



Ansible with Foreman

1. Deploy and assign ansible roles
2. Ansible-rex features
3. Automated job scheduling



Prerequisites @ Foreman

Requires Foreman Rex

1. Use foreman-installer to install Foreman Ansible

```
# foreman-installer --enable-foreman-plugin-ansible --enable-foreman-proxy-plugin-ansible
```

2. To run ansible playbooks as Job Templates, you need Remote Execution

```
# foreman-installer --enable-foreman-plugin-remote-execution --enable-foreman-proxy-plugin-remote-execution-ssh
```



Prerequisites @ Foreman

Smart Proxies » centos7-provision-nightly.nkathole.example.com 

Overview

Services

Logs

Puppet

Puppet CA

Details

Communication



status

URL

https://centos7-provision-nightly.nkathole.example.com:9090

Version

1.23.0-develop

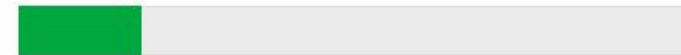
Active features

- Ansible
- DHCP
- Discovery
- DNS
- Dynflow
- HTTPBoot
- Logs
- Openscap
- Pulp
- Puppet
- Puppet CA
- SSH
- Templates
- TFTP

Refresh features

Pulp storage

/var/lib/pulp, /var/lib/pulp/content, ...



Ansible Roles

```
2019-03-18 15:37:51 🕒 repos in /etc/ansible
o → ansible-galaxy install --roles-path /etc/ansible/roles/ manala.motd
- downloading role 'motd', owned by manala
- downloading role from https://github.com/manala/ansible-role-motd/archive/1.0.2.tar.gz
- extracting manala.motd to /etc/ansible/roles/manala.motd
- manala.motd (1.0.2) was installed successfully
```

```
2019-03-18 15:39:52 🕒 repos in /etc/ansible
o → ls -la /etc/ansible/roles/
total 0
drwxr-xr-x. 3 root root 25 Mar 18 15:39 .
drwxr-xr-x. 3 root root 70 Mar 6 18:48 ..
drwxr-xr-x 8 root root 182 Mar 18 15:39 manala.motd
```

▼

Import ▼

From capsule-27840.rht-customer.convergence.net

From capsule-38014.rht-customer.convergence.net

From dell-per420-2.gsslab.rdu2.redhat.com

14 days ago

Select the changes you want to realize in Foreman

Toggle: ☒ New | ☒ Obsolete

<input checked="" type="checkbox"/>	Name	Hosts count	Hostgroups count	Operation
<input type="checkbox"/>	manala.motd	0	0	Add

Cancel

Update



Ansible Roles

Ansible Roles	
<div>Filter ... × 🔍 Search 🔖 ▾</div>	
▲ Name	Hostgroups
linux-system-roles.kdump	0
linux-system-roles.network	0
linux-system-roles.postfix	0
linux-system-roles.selinux	0
linux-system-roles.timesync	0
RedHatInsights.insights-client	1
rhel-system-roles.kdump	0
rhel-system-roles.network	0
rhel-system-roles.postfix	0
rhel-system-roles.selinux	0
rhel-system-roles.timesync	0



Assigning Ansible Roles

Host **Ansible Roles** Virtual Machine Operating System Interfaces

Puppet Classes Parameters Additional Information

Available roles ⓘ

All Items +

- linux-system-roles.postfix
- linux-system-roles.selinux
- linux-system-roles.timesync
- rhel-system-roles.kdump
- rhel-system-roles.network
- rhel-system-roles.postfix

↔

Selected Items -

- manala.motd
- rhel-system-roles.timesync



Run Ansible Roles

The screenshot displays the Foreman web interface. The top navigation bar includes the Foreman logo, a yellow hard hat icon, and the text 'FOREMAN'. It also shows 'Default Organization' and 'Default Location' dropdowns, along with a notification bell and 'Admin User' profile. The left sidebar contains navigation links: Monitor, Content, Hosts, Configure, Infrastructure, and Administer. The main content area shows 'All Hosts » centos7' with a refresh icon. Below this, it states 'Found 4 reports from the last 1 days'. A 'Details' section has tabs for Audits, Facts, Reports, and YAML. The 'Properties' section shows a 'Warning' status, 'No changes' in configuration, and 'Last execution succeeded'. An 'Errata' section contains a warning message: 'Could not calculate errata status, ensure host is registered and the katello-host-tools package is installed'. On the right, a 'Schedule Remote Job' dropdown menu is open, showing options: 'Run Ansible roles' (highlighted), 'Run OpenSCAP scan', 'Boot disk', 'Edit', 'Clone', 'Build', and 'Delete'. Below the menu is a line graph titled 'last 7 days' showing 'Time in Seconds' on the y-axis (0 to 125) and time on the x-axis (18:32 to 18:42). The graph has two series: 'Config Retrieval' (red line) and 'Runtime' (blue area). The 'Runtime' series shows a peak of approximately 105 seconds around 18:38.

FOREMAN Default Organization Default Location Admin User

All Hosts » centos7

Found 4 reports from the last 1 days

Details

Audits Facts Reports YAML

Content

Properties Metrics NICs

Properties

Status Warning

Configuration No changes

Execution Last execution succeeded

Errata Could not calculate errata status, ensure host is registered and the katello-host-tools package is installed

Boot disk Schedule Remote Job Edit Clone Build Delete

Run Ansible roles

Run OpenSCAP scan

last 7 days

Time in Seconds

Config Retrieval Runtime

18:32 18:34 18:36 18:38 18:40 18:42



Assigning Ansible Roles

[Jobs](#) » Run Ansible roles 

[Rerun](#) [Rerun failed](#) [Job Task](#) [Cancel Job](#) [Abort Job](#)

[Overview](#)

[Preview templates](#)

Results



✓ 1 | ✗ 0 | ⌛ 0 | ✕ 0

Target hosts

Manual selection using **static query**

name ^ (sue-zantow.tatu.home)

Evaluated at: 2019-03-18 17:36:20 -0400



root

Ansible Roles - Ansible Default effective user

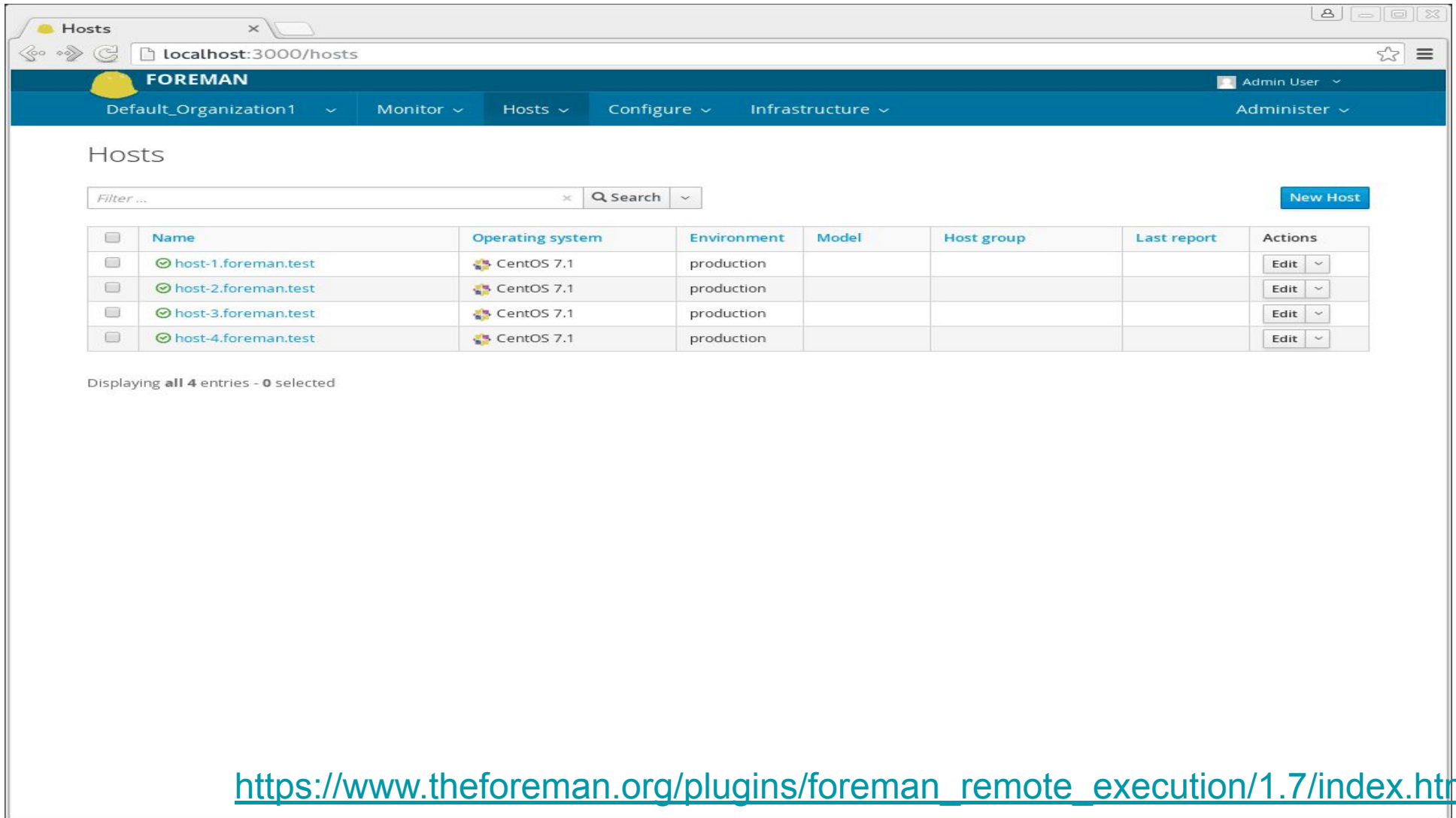


1

Total hosts



Remote Execution Templates



Hosts

Filter ... Search

<input type="checkbox"/>	Name	Operating system	Environment	Model	Host group	Last report	Actions
<input type="checkbox"/>	✔ host-1.foreman.test	CentOS 7.1	production				Edit <input type="button" value="v"/>
<input type="checkbox"/>	✔ host-2.foreman.test	CentOS 7.1	production				Edit <input type="button" value="v"/>
<input type="checkbox"/>	✔ host-3.foreman.test	CentOS 7.1	production				Edit <input type="button" value="v"/>
<input type="checkbox"/>	✔ host-4.foreman.test	CentOS 7.1	production				Edit <input type="button" value="v"/>

Displaying **all 4** entries - **0** selected

https://www.theforeman.org/plugins/foreman_remote_execution/1.7/index.html



Ansible Execution Templates

Job category *

Job template *

Bookmark

Search Query

Resolves to

Ansible Playbook

Ansible Commands

Ansible Galaxy

Ansible Packages

Ansible Playbook

Ansible Power

Ansible Puppet

Ansible Roles Installation

Ansible Services

0 hosts

[Display advanced fields](#)

Job category *

Ansible Packages

Job template *

Package Action - Ansible Default

Bookmark

Search Query

robin*

Resolves to

1 hosts

state ⓘ

present

name ⓘ *

httpd

> Display advanced fields

Schedule

☒ Execute now

☐ Schedule future execution

☐ Set up recurring execution

Submit

Cancel



Katello via ansible

Job category *

Job template *

Bookmark

Search Query

Resolves to

errata ⓘ *

- Install Errata - Katello Ansible Default
- Install Group - Katello Ansible Default
- Install Package - Katello Ansible Default
- Remove Group - Katello Ansible Default
- Remove Package - Katello Ansible Default
- Restart Services - Katello Ansible Default
- Update Group - Katello Ansible Default


> [Display advanced fields](#)



Ansible Execution Templates

[Overview](#) [Preview templates](#)

Results



100%
Success

✓ 1 | ✗ 0 | ⚙ 0 | ✕ 0

Package Action - Ansible Default - Ansible

✓ robin-korey.rht-customer.convergence.net


```
# For Windows targets use the win_package module instead.
---
- hosts: all
  tasks:
    - package:
      name: httpd
      state: present
```


Target hosts

Manual selection using **static query**

robin*

Evaluated at: 2019-02-06 13:16:07 -0500

 **root**
Package Action - Ansible Default effective user

 **1**
Total hosts

User Inputs

- **state:** present
- **name:** httpd
- **pre_script:**
- **post_script:**



Ansible Execution Templates

Job category *

Job template *

Bookmark

Search Query

Resolves to 1 hosts

command ⓘ * 1

> [Display advanced fields](#)

Schedule ☒ Execute now ☐ Schedule future execution ☐ Set up recurring execution

Output:

```
PLAY [all] *****

TASK [Gathering Facts] *****

ok: [192.168.169.170]

TASK [shell] *****

changed: [192.168.169.170]

TASK [debug] *****
ok: [192.168.169.170] => {
  "out": {
    "changed": true,
    "cmd": "df -h ; date",
    "delta": "0:00:00.023758",
    "end": "2019-03-16 22:10:26.833562",
    "failed": false,
    "rc": 0,
    "start": "2019-03-16 22:10:26.809804",
    "stderr": "",
    "stderr_lines": [],
    "stdout": "Filesystem      Size  Used Avail Use% Mounted on\n/dev/vda1\n/devtmpfs      897M   0  897M   0% /dev/\n/tmpfs         920M   0   920M   0% /dev/shm/\n/tmpfs         920M  17M  903M   2% /run/\n/tmpfs         920M   0   920M   0% /sys/fs/cgroup/\n/tmpfs        184M   0   184M   0% /run/user/0/\nSat Mar 16 22:10:26 EDT 2019"
  }
}
```



When Foreman meets AWX

Scaling up ansible usage

- a. Dynamic inventory
 - i. Allowing AWX to use Foreman as a dynamic inventory source
- b. Provisioning callback
 - i. Allowing systems provisioned via Foreman to 'callback' to AWX so that playbook runs can happen post provisioning



Configuration @ AWX


Deploy /etc/ansible/foreman.ini on AWX

```
[root@tower ansible]# cat /etc/ansible/foreman.ini | grep -v ^$ | grep -v ^#  
[foreman]  
url = http://localhost:3000/  
user = foreman  
password = secret  
ssl_verify = True  
[ansible]  
group_patterns = [{"app}-{tier}-{color}",  
                  "{app}-{color}",  
                  "{app}",  
                  "{tier}"]  
  
group_prefix = foreman_  
want_facts = True  
want_hostcollections = True  
rich_params = False  
want_ansible_ssh_host = False  
[cache]  
path = .  
max_age = 60  
scan_new_hosts = True
```

<https://raw.githubusercontent.com/ansible/awx/devel/awx/plugins/inventory/foreman.ini.example>



Dynamic inventory




INVENTORIES / foreman inventory / HOSTS

foreman inventory

DETAILS PERMISSIONS GROUPS **HOSTS** SOURCES COMPLETED JOBS

SEARCH

HOSTS 	RELATED GROUPS
<input type="checkbox"/> <input type="button" value="ON"/> <input type="radio"/> centos7.nkathole.example.com	<div>foreman_content_view_contentview <input type="button" value="x"/></div> <div>foreman_location_defaultlocation <input type="button" value="x"/></div> <div>foreman_lifecycle_environment_development <input type="button" value="x"/></div> <div>foreman_organization_defaultorganization <input type="button" value="x"/></div>
<input type="checkbox"/> <input type="button" value="ON"/> <input type="radio"/> centos7-provision-nightly.nkathole.example.com	<div>foreman_environment_production <input type="button" value="x"/></div> <div>foreman_location_defaultlocation <input type="button" value="x"/></div> <div>foreman_organization_defaultorganization <input type="button" value="x"/></div>
<input type="checkbox"/> <input type="button" value="ON"/> <input type="radio"/> osdc-demo.example.com	<div>foreman_content_view_contentview <input type="button" value="x"/></div> <div>foreman_hostgroup_hostgroupcentos7 <input type="button" value="x"/></div> <div>foreman_location_defaultlocation <input type="button" value="x"/></div> <div>foreman_environment_production <input type="button" value="x"/></div> <div>foreman_lifecycle_environment_development <input type="button" value="x"/></div> <div>VIEW MORE</div>

Views: Dashboard, Jobs, Schedules, My View

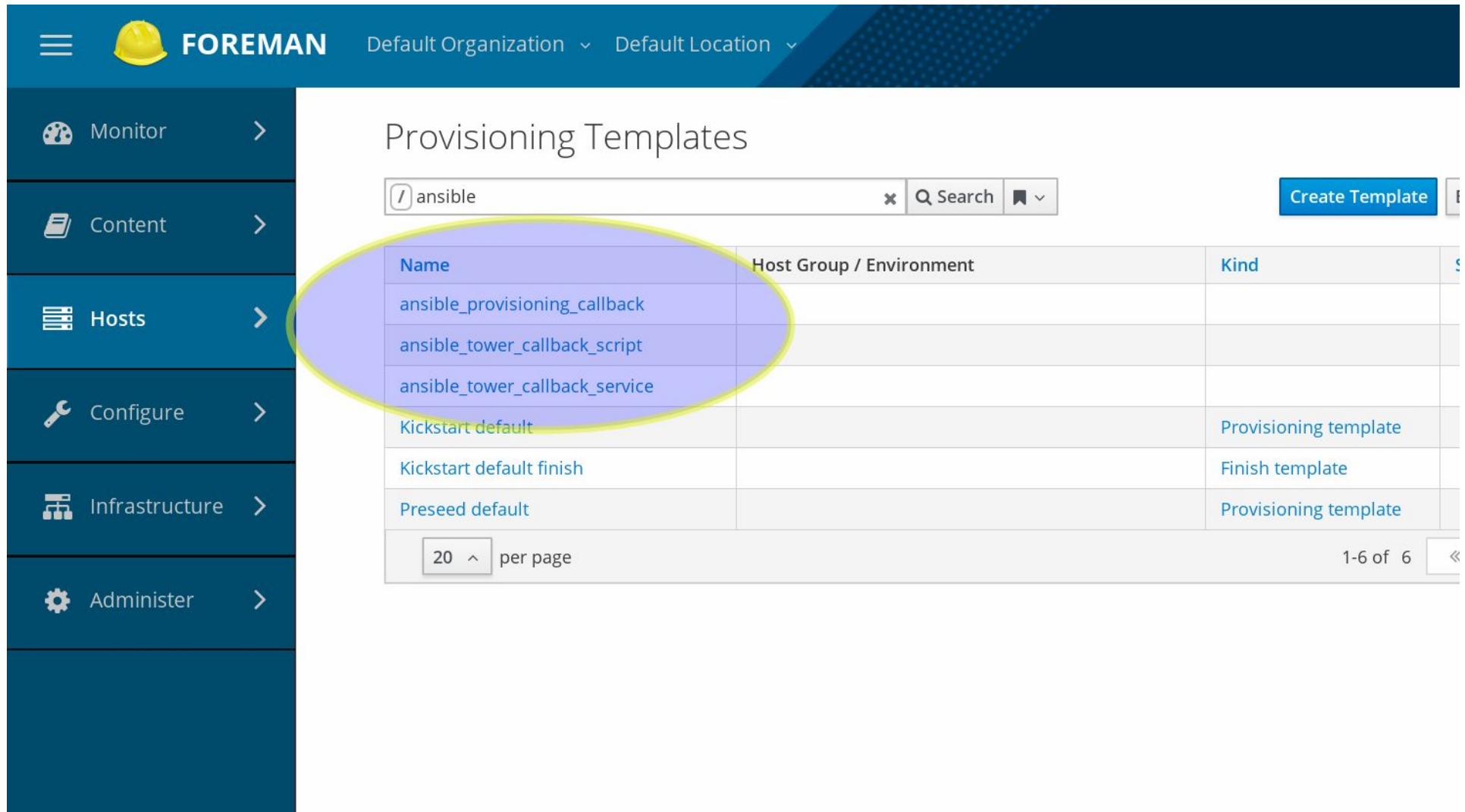
Resources: Templates, Credentials, Projects, Inventories, Inventory Scripts

Access: Organizations, Users, Teams

Administration:



Post-Provisioning callback

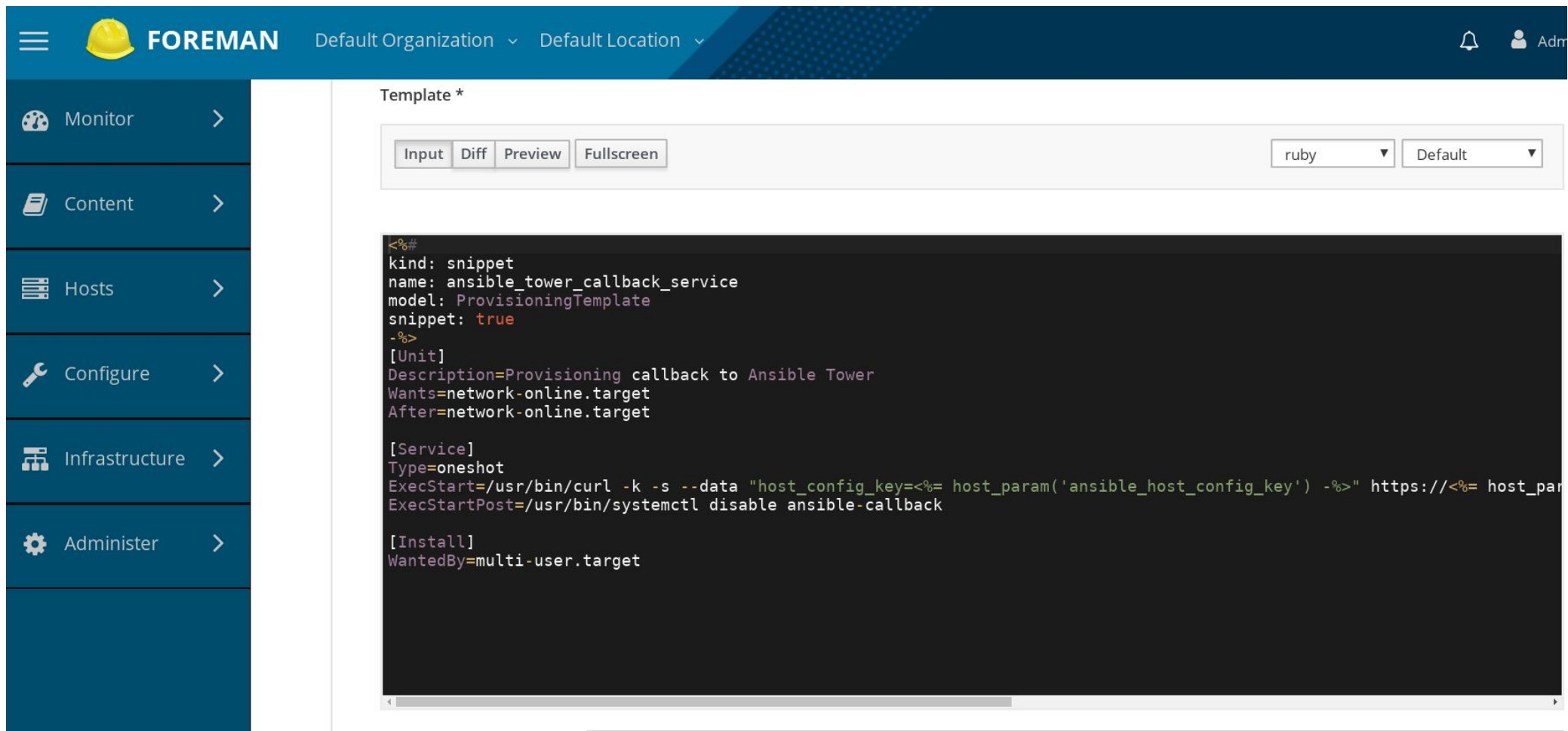


The screenshot shows the Foreman web interface. The top navigation bar includes the Foreman logo, a menu icon, and dropdowns for 'Default Organization' and 'Default Location'. The left sidebar contains navigation links: Monitor, Content, Hosts, Configure, Infrastructure, and Administer. The main content area is titled 'Provisioning Templates'. A search bar at the top of the table contains the text 'ansible'. A table lists the provisioning templates, with the first three rows highlighted by a yellow oval. The table has columns for Name, Host Group / Environment, and Kind. The bottom of the table shows pagination controls: '20 per page' and '1-6 of 6'.

Name	Host Group / Environment	Kind
ansible_provisioning_callback		
ansible_tower_callback_script		
ansible_tower_callback_service		
Kickstart default		Provisioning template
Kickstart default finish		Finish template
Preseed default		Provisioning template



Post-Provisioning callback




The screenshot shows the Foreman web interface. The top navigation bar includes the Foreman logo, a hamburger menu, and dropdowns for 'Default Organization' and 'Default Location'. The left sidebar contains navigation links: Monitor, Content, Hosts, Configure, Infrastructure, and Administer. The main content area is titled 'Template *' and features tabs for 'Input', 'Diff', 'Preview', and 'Fullscreen'. Below the tabs are dropdown menus for 'ruby' and 'Default'. The main area displays a YAML configuration for a provisioning template named 'ansible_tower_callback_service'.

```
<%#  
kind: snippet  
name: ansible_tower_callback_service  
model: ProvisioningTemplate  
snippet: true  
-%>  
[Unit]  
Description=Provisioning callback to Ansible Tower  
Wants=network-online.target  
After=network-online.target  
  
[Service]  
Type=oneshot  
ExecStart=/usr/bin/curl -k -s --data "host_config_key=<%= host_param('ansible_host_config_key') -%>" https://<%= host_param('ansible_host_config_key') -%>  
ExecStartPost=/usr/bin/systemctl disable ansible-callback  
  
[Install]  
WantedBy=multi-user.target
```



Post-Provisioning callback

 **FOREMAN** Default Organization ▾ Default Location ▾

Monitor >

Content >

Hosts >

Configure >

Infrastructure >

Administer >

Template *

Input Diff Preview Fullscreen

```
<%#
kind: snippet
name: ansible_tower_callback_service
model: ProvisioningTemplate
snippet: true
-%>
[Unit]
Description=Provisioning callback to Ansible
Wants=network-online.target
After=network-online.target

[Service]
Type=oneshot
ExecStart=/usr/bin/curl -k -s --data "host_config_key=<%= host_param('ansible_host_config_key') -%>" https://<%= host_param('ansible_tower_fqdn') -%>/api/v2/hosts/<%= host_param('id') -%>/
ExecStartPost=/usr/bin/systemctl disable ansible-callback

[Install]
WantedBy=multi-user.target
```


Global Parameters

Filter ... × 🔍 Search ▾

Name	Value
ansible_host_config_key	b5a34a25-8dc9-492d-9d4e-d1378f8a574f
ansible_job_template_id	7
ansible_tower_fqdn	dell-per720-1.gsslab.rdu2.redhat.com
ansible_tower_provisioning	true



Post-Provisioning callback



AWX

Inventories

Inventory Scripts

ACCESS

Organizations

Users

Teams

ADMINISTRATION

Credential Types

Notifications

Management Jobs

Instance Groups

Applications

Settings

Q Demo Credential x

0

* VERBOSITY ? ☐ PROMPT ON LAUNCH

0 (Normal)

JOB TAGS ? ☐ PROMPT ON LAUNCH

SKIP TAGS ?

LABELS ?

INSTANCE GROUPS ?

TIMEOUT ?

0

SHOW CHANGES ? ☐ PROMPT ON LAUNCH

OFF

OPTIONS

☐ ENABLE PRIVILEGE ESCALATION ?

☒ ALLOW PROVISIONING CALLBACKS ?

☐ ENABLE CONCURRENT JOBS ?

☐ USE FACT CACHE ?

PROVISIONING CALLBACK URL ?

http://192.168.121.23:80/api/v2/job_templates/5/callback/

* HOST CONFIG KEY ?

bc855909-0504-4979-bd46-d6577fc3976a

EXTRA VARIABLES ?

YAML JSON

1 ---

1



Post-Provisioning callback



```
[root@sue-zantow ~]# curl -k -s -i -X POST -H 'Content-Type:application/json' \  
> --data '{"host_config_key": "7fe7006b-3457-4eeb-989a-ececfc308d07"}' \  
> https://tower.tatu.home:443/api/v2/job_templates/53/callback/  
HTTP/1.1 201 Created  
Server: nginx/1.14.1  
Date: Mon, 18 Mar 2019 22:19:37 GMT  
Content-Length: 0  
Connection: keep-alive  
X-API-Time: 0.250s  
X-API-Total-Time: 0.267s  
Allow: GET, POST, HEAD, OPTIONS  
Content-Language: en  
Vary: Accept, Accept-Language, Cookie  
Location: /api/v2/jobs/2165/  
X-API-Node: localhost  
Strict-Transport-Security: max-age=15768000  
X-Frame-Options: DENY  
Cache-Control: no-cache, no-store, must-revalidate  
Expires: 0  
Pragma: no-cache
```



Post-Provisioning callback

[JOBS](#) / 2165 - [KATELLO] - Ensure Katello client packages are installed (callback)

DETAILS

STATUS ● Successful  

STARTED 3/18/2019 6:19:45 PM


FINISHED 3/18/2019 6:20:04 PM

JOB TEMPLATE [\[KATELLO\] - Ensure Katello client packages are installed \(callback\)](#)


JOB TYPE Run

INVENTORY [Foreman Inventory by HostCollection](#)

PROJECT ● Toca PlayBooks

REVISION 827de38 

PLAYBOOK katello_client.yml

CREDENTIAL  Tower Root

LIMIT sue-zantow.tatu.home

INSTANCE GROUP tower

EXTRA VARIABLES  YAML JSON [EXPAND](#)

1 ---

[KATELLO] - Ensure Katello client packages are installed (callback)

PLAYS 1 TASKS 3 HOSTS 1 ELAPSED 00:00:18  

SEARCH

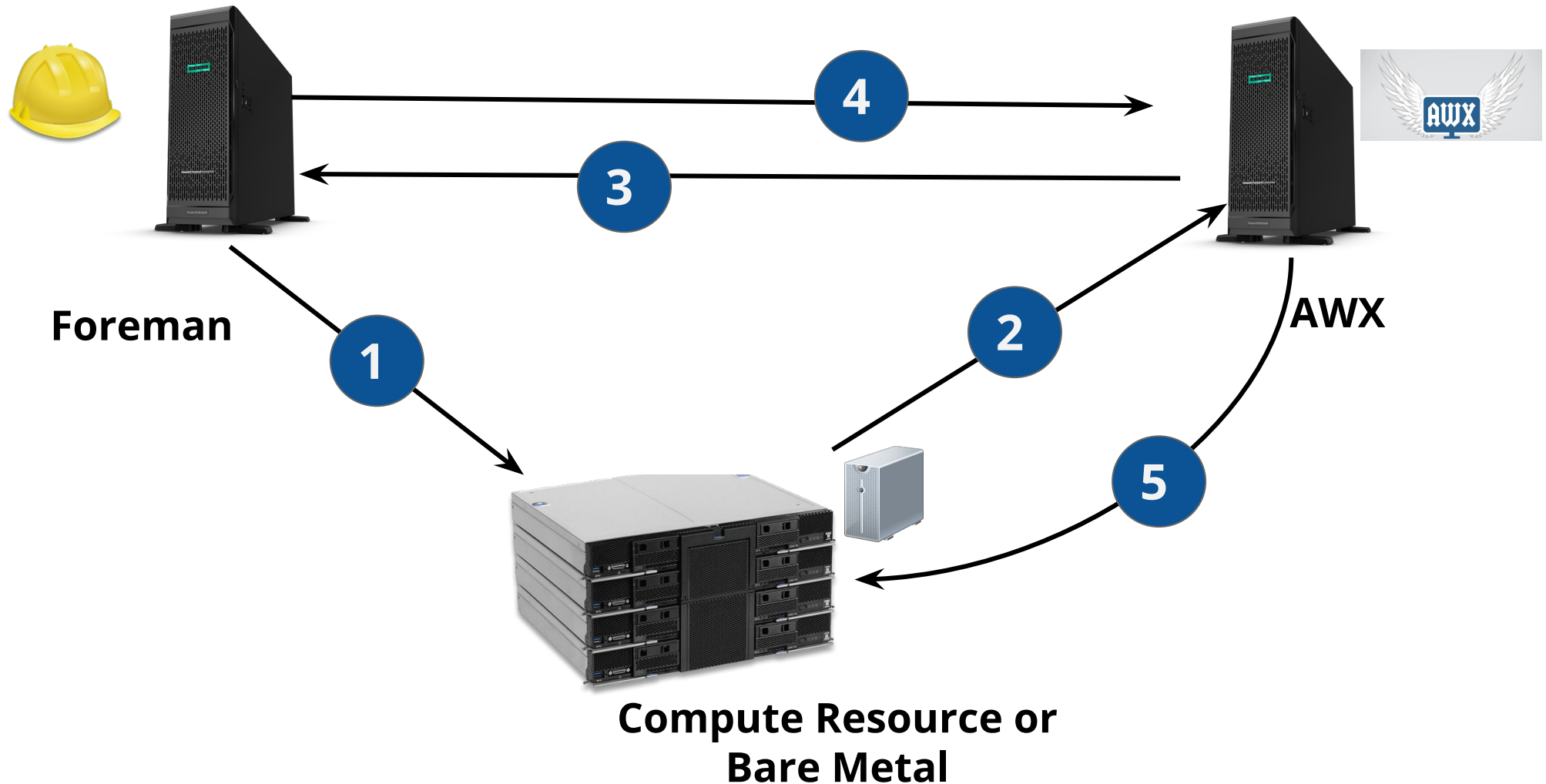
 KEY

```
4 PLAY [Install and enable Katello client packages] ***** 18:20:00
5 *****
6 TASK [Gathering Facts] ***** 18:20:00
7 *****
8 ok: [sue-zantow.tatu.home]
9 TASK [Install katello-agent and katello-host-tools] ***** 18:20:01
10 *****
11 ok: [sue-zantow.tatu.home]
12 TASK [Enable and start Goferd] ***** 18:20:03
13 *****
14 ok: [sue-zantow.tatu.home]
15 PLAY RECAP ***** 18:20:03
16 *****
17 sue-zantow.tatu.home : ok=3    changed=0    unreachable=0    faile
d=0
```



Provisioning callback

How it works?



Foreman-ansible-modules

Ansible modules to interact with Foreman

1. <https://github.com/theforeman/foreman-ansible-modules>
2. Uses python library
<https://github.com/SatelliteQE/nailgun>

- name: "Create OSDC Organization"

foreman_organization:

username: "admin"

password: "changeme"

server_url: "https://foreman.example.com"

name: "OSDC-Organization"

state: present





Now via ansible...

≡ A GALAXY

Home

Search

Community

Community Authors > theforeman > foreman_scap_client



theforeman

⚙️ foreman_scap_client

Installs and configures foreman_scap_client

Details

Read Me

Ansible role for Foreman SCAP client build passing

Ansible role for Foreman SCAP client configures foreman_scap_client to run scans and upload results to foreman proxy.

Configuration

This role will automatically install foreman_scap_client (if not installed), it will configure /etc/foreman_scap_client/config.yaml with parameters which are needed for the operation of foreman_scap_client and create a cron which schedules the client execution.



Questions?

- Visit us <http://theforeman.org/>
- If you do something cool with Foreman, let us know!
- Find us:
 - IRC: irc.freenode.net
 - #theforeman
 - #theforeman-dev
 - Reach out to us at
 - <https://community.theforeman.org/>





FOREMAN

THANK YOU!

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