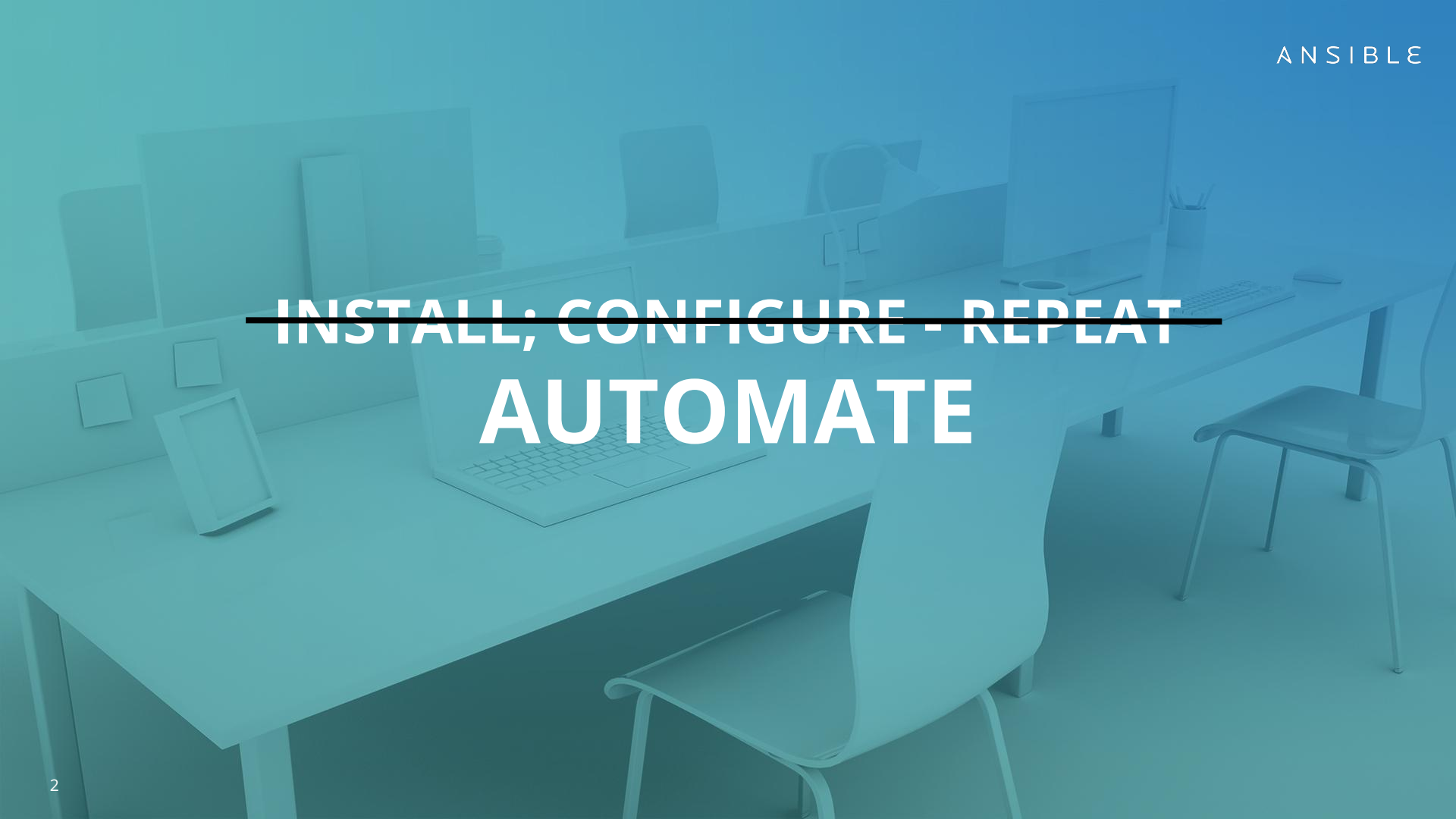




Introduction to Ansible Engine and Ansible Tower

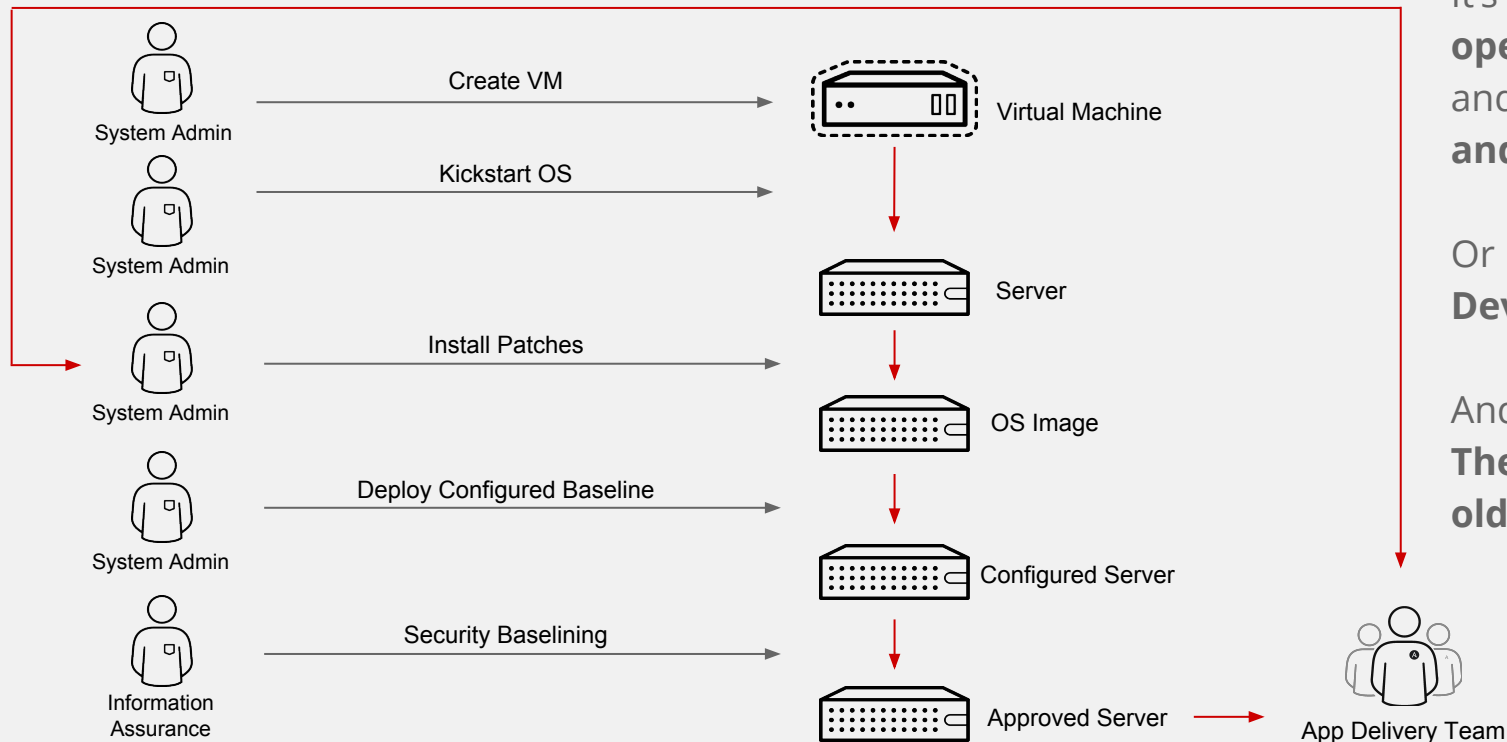
Markus Koch

Partner Enablement Manager SAP



~~INSTALL; CONFIGURE - REPEAT~~ AUTOMATE

THE GOOD OLD DAYS...

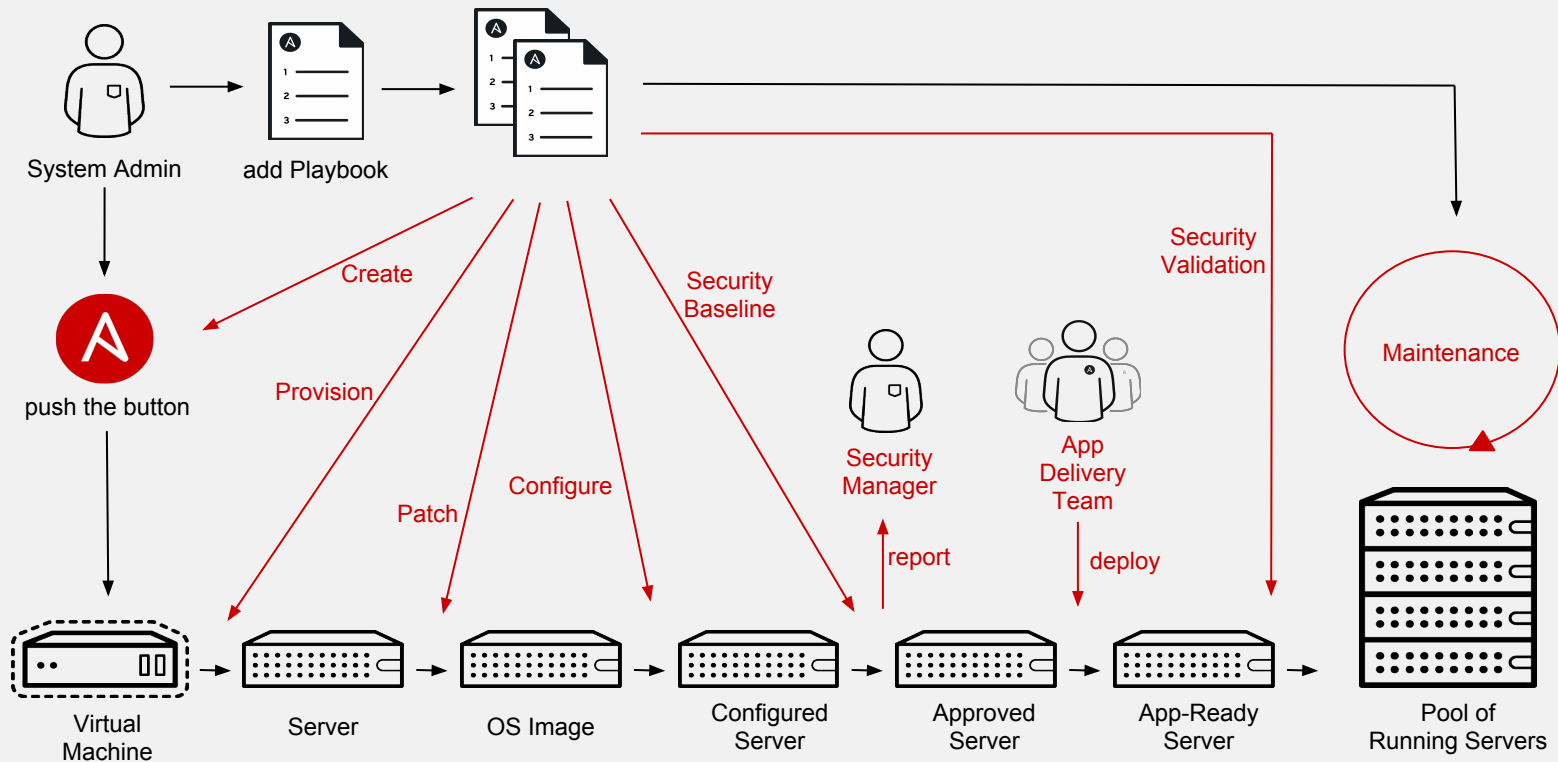


It's hard to **run IT operations this way** and **deliver flexible and agile IT services**.

Or being the **Ops** in **DevOps**.

And yes, you can work **The Cloud** in the **same old way...**

NOTHING ROUTINE SHOULD BE DONE MANUALLY



WHAT IS ANSIBLE AUTOMATION?

The Ansible project is an open source community sponsored by Red Hat. It's also a **simple automation language** that perfectly describes IT application environments in **Ansible Playbooks**.

Ansible Engine is a **supported product** built from the Ansible community project.

```
---
- name: install and start apache
  hosts: web
  become: yes
  vars:
    http_port: 80

  tasks:
    - name: httpd package is present
      yum:
        name: httpd
        state: latest

    - name: latest index.html file is present
      copy:
        src: files/index.html
        dest: /var/www/html/

    - name: httpd is started
      service:
        name: httpd
        state: started
```


v1 - Set config file to use on boot

1. Write multiple configuration files
 - For each environment/region
2. Inspect metadata on boot and use the matching config file



v1 - Set config file to use on boot

1. Write multiple configuration files
 - For each environment/region
2. Inspect metadata on boot and use the matching config file

24,000+

Stars on GitHub

950+

Ansible modules

400,000+

Downloads a month



SIMPLE

Human readable automation
No special coding skills needed
Tasks executed in order
Usable by every team
Get productive quickly



POWERFUL

App deployment
Configuration management
Workflow orchestration
Network automation
Orchestrate the app lifecycle



AGENTLESS

Agentless architecture
Uses OpenSSH & WinRM
No agents to exploit or update
Get started immediately
More efficient & more secure

THE ANSIBLE WAY

CROSS PLATFORM

Agentless support for all major OS variants, physical, virtual, cloud and network devices.

HUMAN READABLE

Perfectly describe and document every aspect of your application environment.

PERFECT DESCRIPTION OF APPLICATION

Every change can be made by Playbooks, ensuring everyone is on the same page.

VERSION CONTROLLED

Playbooks are plain-text. Treat them like code in your existing version control.

DYNAMIC INVENTORIES

Capture all the servers 100% of the time, regardless of infrastructure, location, etc.

ORCHESTRATION PLAYS WELL WITH OTHERS

Every change can be made by Playbooks, ensuring everyone is on the same page.

WHAT CAN I DO WITH ANSIBLE?

Automate the deployment and management of your entire IT footprint.

Do this...

Configuration
Management

Orchestration

Application
Deployment

Provisioning

Continuous
Delivery

Security and
Compliance

On these...

Firewalls

Load Balancers

Applications

Containers

Clouds

Servers

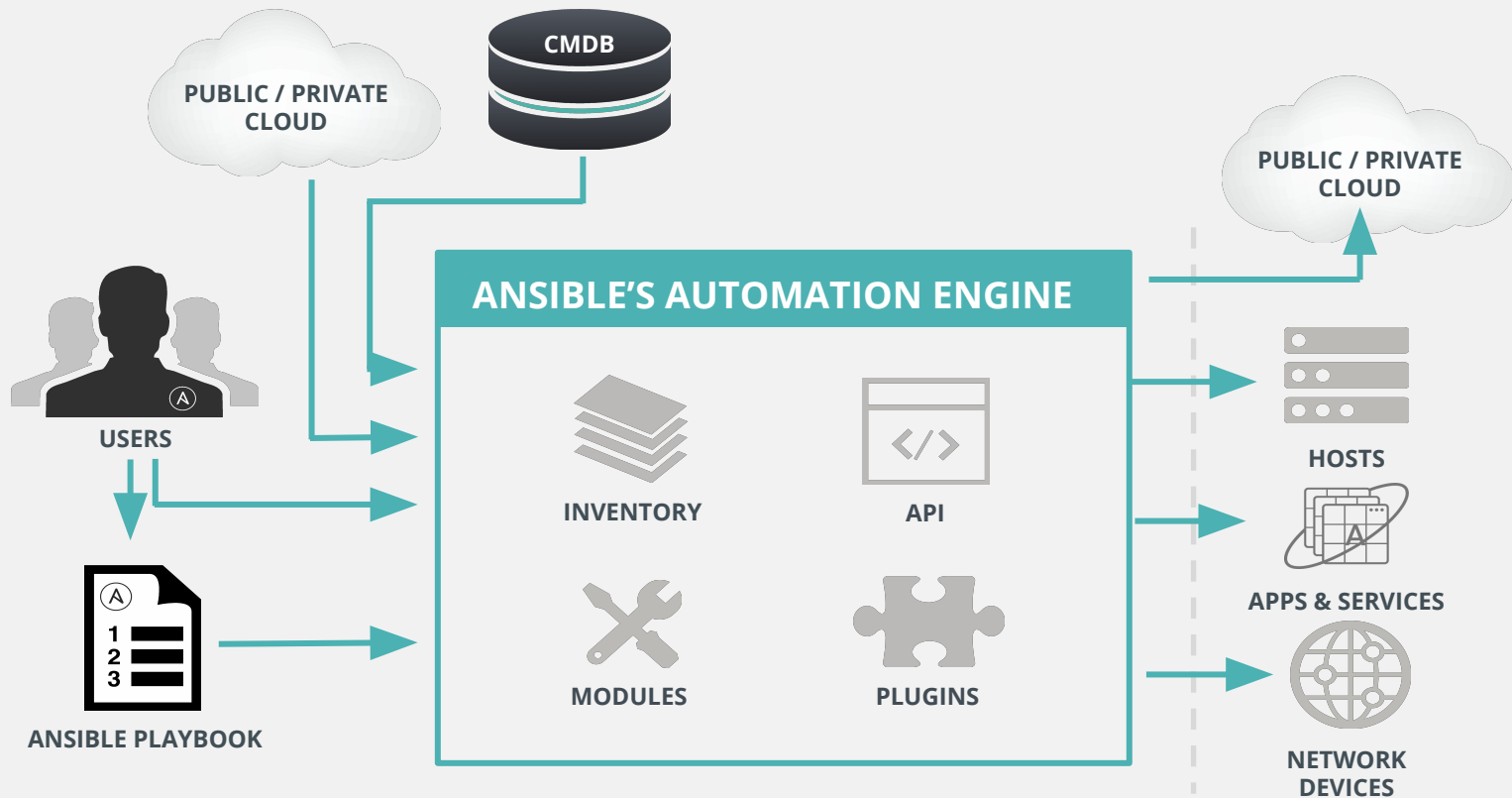
Infrastructure

Storage

Network Devices

And more...

HOW ANSIBLE WORKS



PLAYBOOK EXAMPLE: INSTALL & CONFIGURE APACHE

```
---
- name: install and start apache
  hosts: all
  vars:
    http_port: 80
    max_clients: 200
  become_user: root
  tasks:
    - name: install httpd
      yum: pkg=httpd state=latest
    - name: write the apache config file
      template: src=/srv/httpd.j2 dest=/etc/httpd.conf
    - name: start httpd
      service: name=httpd state=running
```


PLAYBOOK EXAMPLE: AWS CLOUD DEPLOYMENT

```
- hosts: localhost
  connection: local
  gather_facts: False
  tasks:
    - name: Provision a set of instances
      ec2:
        key_name: my_key
        group: test
        instance_type: t2.micro
        image: "{{ ami_id }}"
        wait: true
        exact_count: 5
        count_tag:
          Name: Demo
        instance_tags:
          Name: Demo
      register: ec2

    - name: Add all instance public IPs to dynamic host group
      add_host: hostname={{ item.public_ip }} groups=ec2hosts
      with_items: "{{ ec2.instances }}"
```


PLAYBOOK EXAMPLE: AWS CLOUD DEPLOYMENT

```
- hosts: ec2hosts
  name: configuration play
  user: ec2-user
  gather_facts: true
  tasks:
    - name: Check NTP service
      service:
        name: ntpd
        state: started
```



```
yum install @base xfsprogs libaio net-tools bind-utils gtk2 libicu xulrunner tcsh  
sudo libssh2 expect cairo graphviz iptraf-ng krb5-workstation krb5-libs libpng12  
ntp ntpdate nfs-utils lm_sensors rsyslog openssl098e openssl  
PackageKit-gtk3-module libcanberra-gtk2 libtool-ltdl xorg-x11-xauth numactl
```



```
- name: install required packages  
  yum: state=latest name={{ item }}  
  with_items:  
    - chrony  
    - xfsprogs  
    - libaio  
    - net-tools  
    - bind-utils  
    - ...  
    - numactl  
    - tuned-profiles-sap-hana
```



```
systemctl stop numad  
systemctl disable numad  
systemctl status numad
```



```
- name: disable numad  
  service: name=numad state=stopped enabled=no
```



```
setenforce 0  
sed -i 's/SELINUX=enforcing/SELINUX=permissive/' /etc/selinux/config  
sestatus
```



```
- name: disable selinux  
  selinux: state=disabled
```



```
echo "@sapsys soft nproc unlimited" > /etc/security/limits.d/99-sapsys.conf
echo "@sapsys hard nproc unlimited" > /etc/security/limits.d/99-sapsys.conf
```



```
- name: set number of process to unlimited for sapsys group
  pam_limits:
    domain: "@sapsys"
    limit_item: nproc
    limit_type: "{{ item }}"
    value: unlimited
  with_items:
    - soft
    - hard
```



```
echo never > /sys/kernel/mm/transparent_hugepage/enabled
sed -i '/^GRUB_CMDLINE_LINUX*./ s/\"$/ transparent_hugepage=never\"/'
/etc/default/grub
grub2-mkconfig -o /boot/grub2/grub.cfg
```



```
- name: disable transparent hugepages in grub config
  lineinfile:
    dest: /etc/default/grub
    line: GRUB_CMDLINE_LINUX_DEFAULT="transparent_hugepage=never"
    notify: regenerate grub2 conf

...

handlers:
  - name: regenerate grub2 conf
    shell: grub2-mkconfig -o /boot/grub2/grub.cfg
```



```
echo "vm.swappiness=60" >> /etc/sysctl.d/90-sap_hana.conf
echo "kernel.msgmni=32768" >> /etc/sysctl.d/90-sap_hana.conf
...
sysctl -p /etc/sysctl.d/90-sap_hana.conf
```



```
- name: setting kernel tunables
  sysctl: name={{ item.name }} value={{ item.value }} state=present
  sysctl_set=yes reload=yes
  with_items:
    - { name: kernel.msgmni, value: 32768 }
    ...
    - { name: vm.swappiness, value: 60 }
    ...
```



```
lvcreate -L 1G -n lv_usr_sap /dev/vg00
lvcreate -l +100%FREE -n lv_hana /dev/vg01
mkfs.xfs /dev/vg01/lv_hana
mkfs.xfs /dev/vg00/lv_usr_sap
mkdir /usr/sap
mount /dev/vg00/lv_usr_sap /usr/sap/
mkdir /hana
mount /dev/vg01/lv_hana /hana
```



```
- name: create logical volumes
  lvol: state=present vg=vg00 \
        lv=lv_hana size="100%FREE"

- name: create filesystems
  filesystem:
    dev: /dev/vg01/lv_hana
    fstype: xfs
    force: no
```

```
- name: mount and make fstab entries
  mount:
    name: "/hana"
    fstype: xfs
    opts: defaults
    passno: 4
    src: "/dev/vg01/lv_hana"
    state: mounted
```


ANSIBLE SHIPS WITH OVER 1250 MODULES (THIS IS WHERE THE MAGIC HAPPENS)

ANSIBLE

CLOUD

AWS
Azure
CenturyLink
CloudScale
Digital Ocean
Docker
Google
Linode
OpenStack
Rackspace
And more...

VIRT AND CONTAINER

Docker
VMware
RHEV
OpenStack
OpenShift
Atomic
CloudStack
And more...

WINDOWS

ACLs
Files
Commands
Packages
IIS
Regedits
Shell
Shares
Services
Configs
Users
Domains
And more...

NETWORK

Arista
A10
Cumulus
Big Switch
Cisco
Cumulus
Dell
F5
Juniper
Palo Alto
OpenSwitch
And more...


NOTIFY

HipChat
IRC
Jabber
Email
RocketChat
Sendgrid
Slack
Twilio
And more...

ANSIBLE GALAXY CONTAINS MANY READY TO USE ROLES

<http://galaxy.ansible.com>

ANSIBLE

 GALAXY

ABOUTEXPLORESEARCHBROWSE AUTHORSMY CONTENTRHMK

EXPLORE

Most Starred

Name	Stars
carlosbuenosvinos.ansistrano-deploy	1475
dev-sec.os-hardening	736
elastic.elasticsearch	569
jdauphant.nginx	543
geerlingguy.mysql	488
ANXS.postgresql	476
angstwad.docker_ubuntu	428
geerlingguy.jenkins	403
DavidWittman.redis	403
thefinn93.letsencrypt	373

View More

Most Watched

Name	Watchers
elastic.elasticsearch	206
couchbaselabs.couchbase-server	137
CumulusNetworks.cumulus-linux-ansib...	95
cumulus.CumulusLinux	95
ceph.ceph-defaults	86
ceph.ceph-config	73
dev-sec.os-hardening	73
carlosbuenosvinos.ansistrano-deploy	72
cumulus.activedirectory-auth-client	71
CumulusNetworks.activedirectory-auth...	71

View More

Most Downloaded

Name	Downloads
DavidWittman.redis	262134
Stouts.grafana	230617
nickhammond.logrotate	135844
geerlingguy.composer	130095
geerlingguy.java	125573
geerlingguy.redis	112613
geerlingguy.nginx	111275
geerlingguy.mysql	99108
geerlingguy.php	95503
Stouts.mongodb	87277

View More

Top Tags

Tag	# Repos
system	4824
development	2431
web	2049
monitoring	1057

Top Contributors

User	# Repos
andrewrothstein	243
mrlesmithjr	187
softasap	156
debops	134

Newest

Name	Added On
tenequm.security	16 Apr
mimacom.crowd	16 Apr
jaredhocutt.rocketchat	16 Apr
heriet.lookup_ini_sections	16 Apr

Search

22

HOW & WHERE TO GET ANSIBLE?

Install Ansible Engine on Red Hat Enterprise Linux 7 with any of the following methods:

If you have a Red Hat **Ansible Engine Subscription**, subscribe the system and enable the Ansible Engine repository **rhel-7-server-ansible-2.4-rpms**.

If you are a RHEL only Customer **enable** the **RHEL Extras repository**. The Extras repo release cycle may not update on the same cycle as the Ansible Engine repo.

RPMs of Ansible Engine releases are available from **releases.ansible.com**.

<https://access.redhat.com/articles/3174981>



RED HAT
ANSIBLE
Tower

AUTOMATION FOR TEAMS

Ansible Tower technical introduction and overview



SIMPLE



POWERFUL



AGENTLESS

What is Missing?



CENTRAL

Central place for everyone

Overview of present and past

Schedule jobs

Have one common view



INTEGRATION

Simple, powerful API

Uses REST for quick adoption

No special agents or lib needed

Integrate with everything



ACCESS

Teams and users enable RBAC

Deposit credentials securely

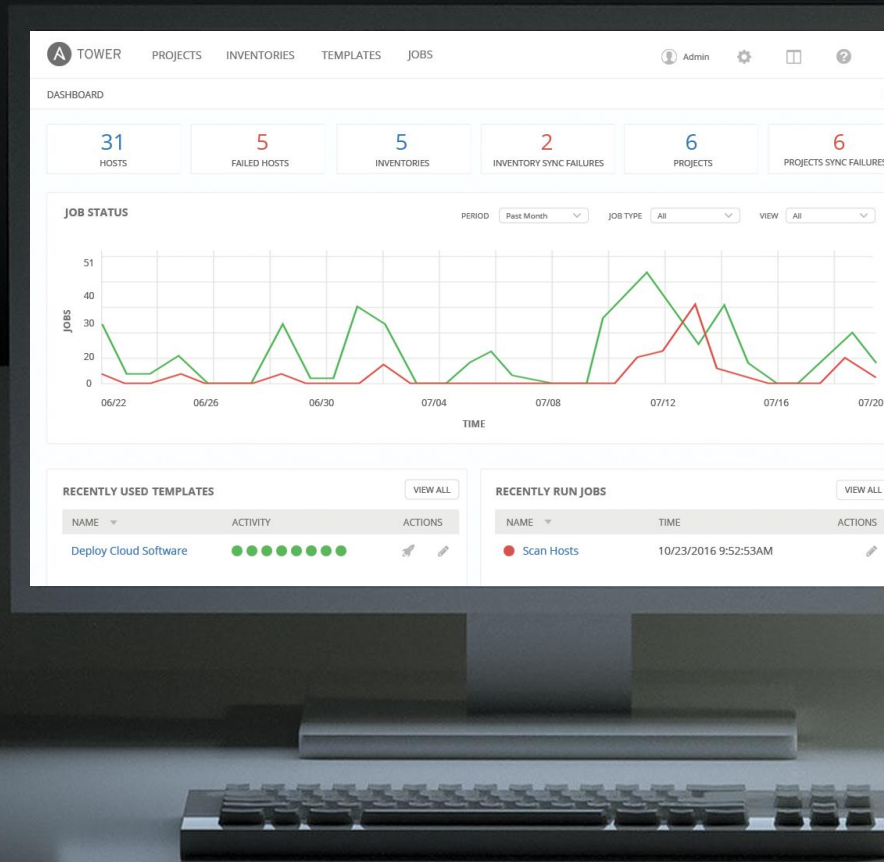
Assign access to unprivileged

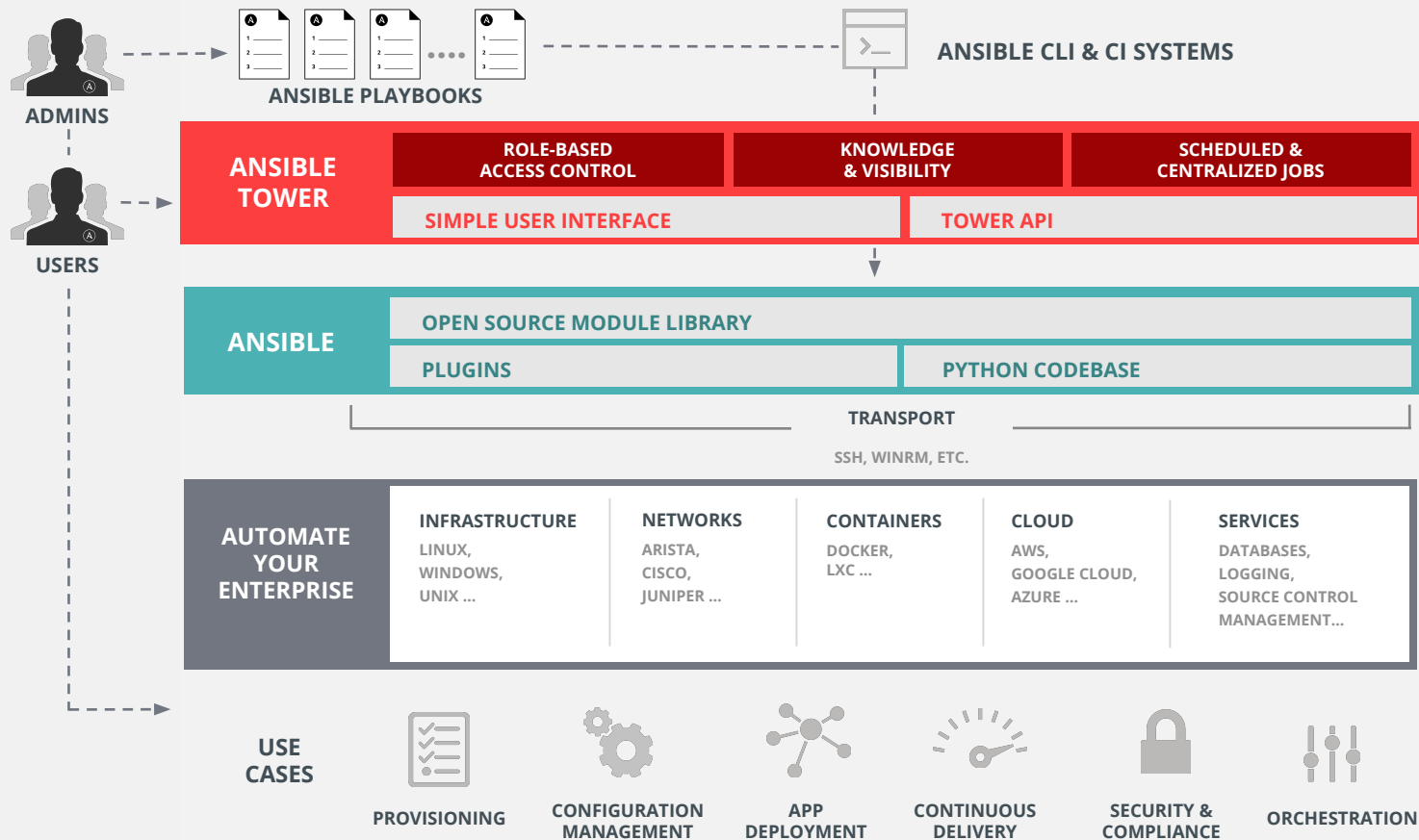
Separate access and execution

WHAT IS ANSIBLE TOWER?

Ansible Tower is an **enterprise framework** for controlling, securing and managing your Ansible automation – with a **UI and RESTful API**.

- **Role-based access control**
- **Deploy** entire applications with **push-button deployment** access
- All automations are **centrally logged**





ANSIBLE TOWER

JOB STATUS UPDATE

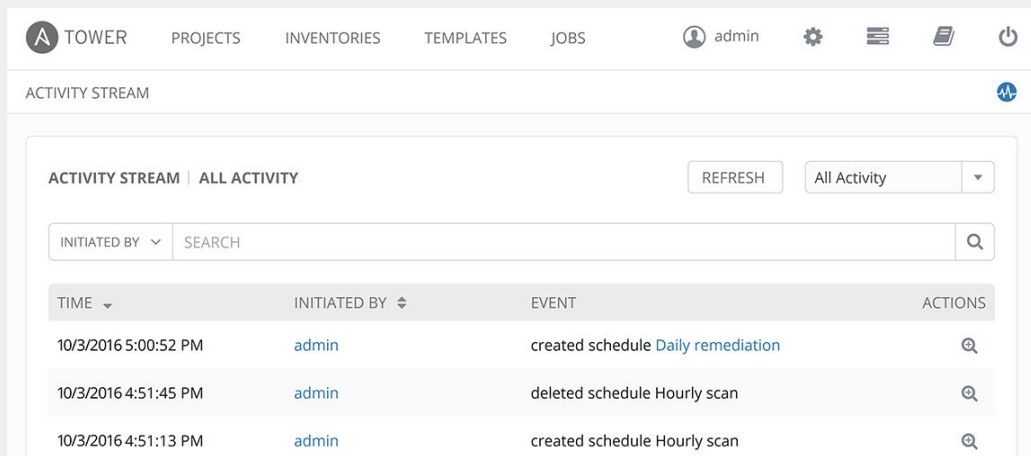
Heads-up NOC-style **automation dashboard** displays everything going on in your Ansible environment.

The screenshot displays the Ansible Tower web interface. On the left, the 'DETAILS' sidebar shows job information: STATUS is 'Successful', STARTED is '1:00:07 AM', FINISHED is '1:00:12 AM', TEMPLATE is 'Update License Server', JOB TYPE is 'Playbook Run', LAUNCHED BY is 'User', INVENTORY is 'License Server', PROJECT is 'License', REVISION is '00000000', PLAYBOOK is 'store.yml', CREDENTIAL is 'License Server Deployment', LIMIT is 'Store', and VERBOSITY is 'Update License Server'. Below this, 'EXTRA VARIABLES' are listed: 1. expire_time: 1453164676, 2. vmware_host: cent7issue. At the bottom of the sidebar are 'LABELS' and buttons for 'UPDATES' and 'QA'.

The main panel shows the job 'REMOVE VMWARE HOST' with a progress bar and a summary of 15 hosts. Below the progress bar is a search bar and a list of tasks. The tasks are as follows:

- 1 PLAY [Remove VMWare Host] 00:00:05
- 2 GATHERING FACTS 00:00:01
- 15 TASK: [ansiblelicense | install required packages via yum] 00:00:01
 - 17 ok: [74.207.226.226]
 - 18 ok: [74.207.226.226]
- 20 TASK: [ansiblelicense | update setuptools] 00:00:01
- 29 TASK: [ansiblelicense | update pip] 00:00:01
- 36 TASK: [ansiblelicense | create unprivileged user for ansiblelicense] 00:00:01
 - 37 skipping: [74.207.226.226]
 - 38 skipping: [74.207.226.226]
- 40 TASK: [ansiblelicense | configure ansiblelicense directory permissions] 00:00:01
 - 41 changed: [74.207.226.226]
 - 42 changed: [74.207.226.226]
- 43 TASK: [ansiblelicense | enable maintenance page] 00:00:01
- 44 TASK: [ansiblelicense | check ssh connection to github] 00:00:01
 - 66 ok: [74.207.226.226]
- 67 PLAY RECAP
- 69

ANSIBLE TOWER



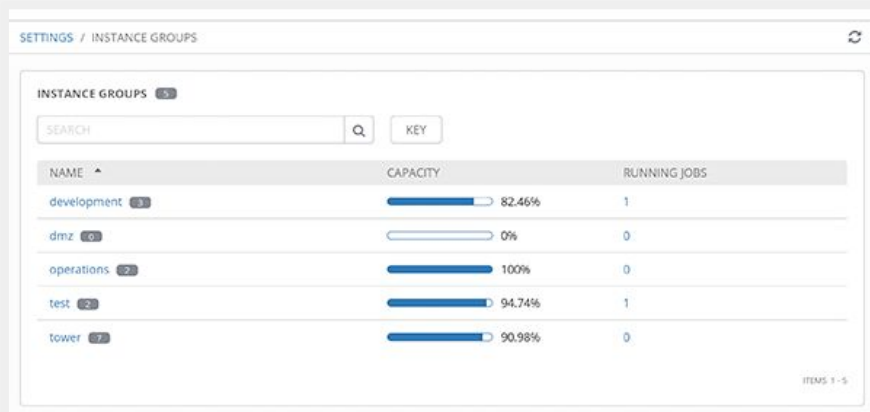
The screenshot shows the Ansible Tower web interface. At the top is a navigation bar with links for TOWER, PROJECTS, INVENTORIES, TEMPLATES, and JOBS. On the right of the navigation bar, there is a user profile for 'admin' and several icons for settings, lists, documents, and power. Below the navigation bar is a header for the 'ACTIVITY STREAM' section. The main content area is titled 'ACTIVITY STREAM | ALL ACTIVITY' and includes a 'REFRESH' button and a dropdown menu currently set to 'All Activity'. Below this is a search bar with a dropdown for 'INITIATED BY' and a 'SEARCH' input field. The activity stream is presented as a table with four columns: TIME, INITIATED BY, EVENT, and ACTIONS. The table contains three entries, all initiated by 'admin'.

TIME	INITIATED BY	EVENT	ACTIONS
10/3/2016 5:00:52 PM	admin	created schedule Daily remediation	
10/3/2016 4:51:45 PM	admin	deleted schedule Hourly scan	
10/3/2016 4:51:13 PM	admin	created schedule Hourly scan	

ACTIVITY STREAM

Securely stores every Job that runs, and enables you to view them later, or export details through Tower's API.

ANSIBLE TOWER



NAME	CAPACITY	RUNNING JOBS
development	82.46%	1
dmz	0%	0
operations	100%	0
test	94.74%	1
tower	90.98%	0

SCALE-OUT CLUSTERING

Connect multiple Tower nodes into a Tower cluster to add redundancy and capacity to your automation platform.

Add reserved capacity and capacity by organization, and deploy remote execution nodes for additional local capacity.

ANSIBLE TOWER

TOWER PROJECTS INVENTORIES TEMPLATES JOBS admin

JOB TEMPLATES SCHEDULES / JOB TEMPLATE SCHEDULES.EDIT

DAILY REMEDIATION

* NAME: Daily remediation

* START DATE (MM/DD/YYYY): 10/03/2016

* START TIME (HH24:MM:SS): 01 : 23 : 45

* LOCAL TIME ZONE: America/New_York

* REPEAT FREQUENCY: Day

FREQUENCY DETAILS

* EVERY: 1 DAYS

* END: Never

SCHEDULE DESCRIPTION

every day

OCCURRENCES (Limited to first 10) DATE FORMAT ☒ LOCAL TIME ☐ UTC

10/03/2016 01:23:45 EDT

SCHEDULE JOBS

Enables you to any Job now, later, or forever.

ANSIBLE TOWER

MANAGE AND TRACK YOUR INVENTORY

Tower's **inventory syncing** and **provisioning callbacks** allow nodes to request configuration on demand, enabling autoscaling.

Smart Inventories allow you to organize and automate hosts across all your providers based on a powerful host fact query engine.

See alerts from Red Hat Insights directly from Tower, and use Insights-provided Playbook Remediation to fix issues in your infrastructure.

The screenshot displays the Ansible Tower web interface. The top navigation bar includes links for TOWER, PROJECTS, INVENTORIES, TEMPLATES, JOBS, and a user profile (admin). The breadcrumb trail indicates the current location: INVENTORIES / MANAGE CLOUD STAGING SERVERS / EDIT.

The main content area is titled 'CLOUD SERVERS' and contains several configuration sections:

- DETAILS** and **NOTIFICATIONS** tabs are visible.
- * NAME:** A text input field containing 'Cloud servers'.
- DESCRIPTION:** An empty text input field.
- SOURCE:** A dropdown menu currently set to 'Amazon EC2'.
- CLOUD CREDENTIAL:** A search input field with 'Amazon keys' entered.
- REGIONS:** A dropdown menu with 'US East (Northern Virginia)' selected.
- INSTANCE FILTERS:** A text input field containing 'tag:Name=*staging*'.
- ONLY GROUP BY:** An empty text input field.
- UPDATE OPTIONS:** A list of checkboxes: 'Overwrite' (checked), 'Overwrite Variables' (checked), and 'Update on Launch' (unchecked).
- VARIABLES:** Radio buttons for 'YAML' (selected) and 'JSON'.

At the bottom, there is a table with one row containing the number '1'.

ANSIBLE TOWER

LAUNCH JOB | DEPLOY SOFTWARE

INVENTORY

CREDENTIAL

SURVEY

* ENTER NUMBER OF SERVICE INSTANCES.

* PLEASE SELECT THE SERVICE OWNER.

Alice

* ENTER PASSWORD FOR DEPLOYED CERTIFICATE.

SHOW

INVENTORY

Cloud staging servers

CREDENTIAL

Staging ssh key

CANCEL

LAUNCH

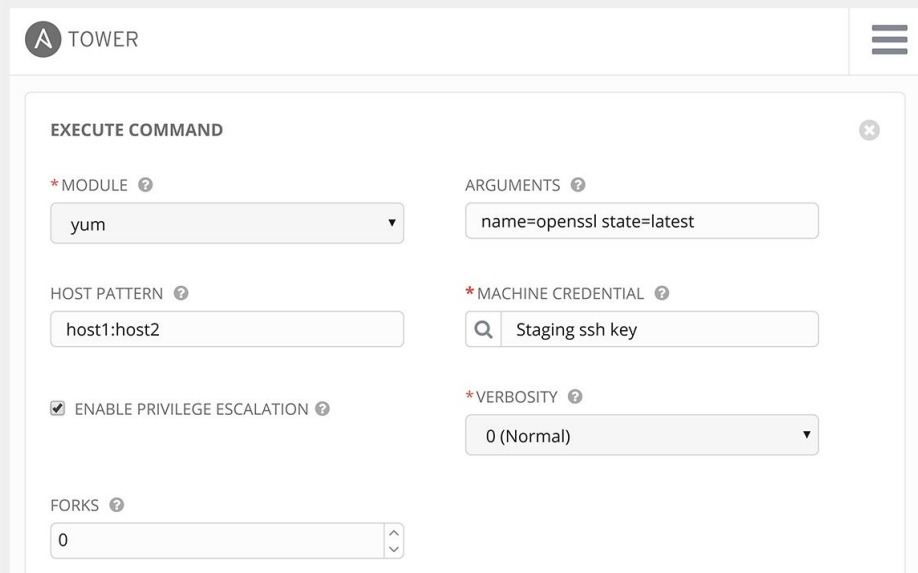
SELF-SERVICE IT

Tower lets you launch Playbooks with just a single click. It can prompt you for variables, let you choose from available secure credentials and monitor the resulting deployments.

ANSIBLE TOWER

REMOTE COMMAND EXECUTION

Run simple tasks on any hosts with Tower's **remote command execution**. Add users or groups, reset passwords, restart a malfunctioning service or patch a critical security issue, quickly.



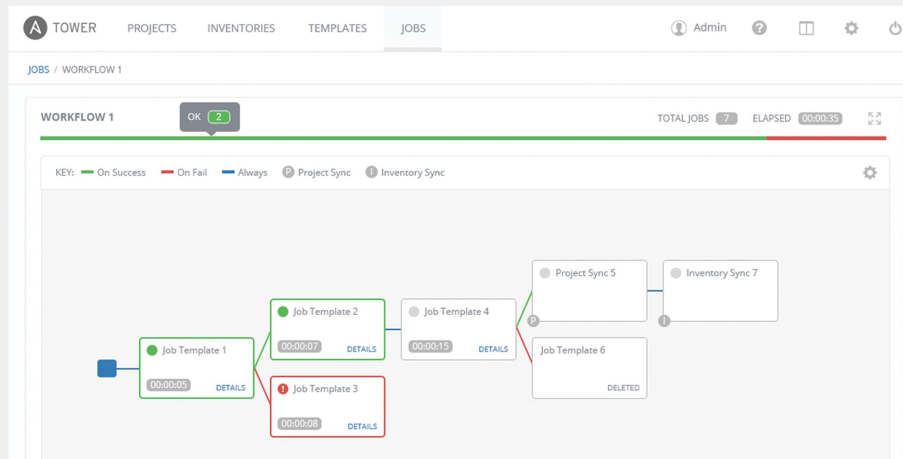
The screenshot shows the 'EXECUTE COMMAND' form in the Ansible Tower web interface. The form is titled 'EXECUTE COMMAND' and includes a close button (X) in the top right corner. It contains several input fields and checkboxes:

- *MODULE**: A dropdown menu with 'yum' selected.
- ARGUMENTS**: A text input field containing 'name=openssl state=latest'.
- HOST PATTERN**: A text input field containing 'host1:host2'.
- *MACHINE CREDENTIAL**: A search input field with a magnifying glass icon and the text 'Staging ssh key'.
- ENABLE PRIVILEGE ESCALATION**: A checked checkbox.
- *VERBOSITY**: A dropdown menu with '0 (Normal)' selected.
- FORKS**: A text input field with '0' and up/down arrow buttons.

ANSIBLE TOWER

MULTI-PLAYBOOK WORKFLOWS


Tower's multi-Playbook workflows chains any number of Playbooks together to create a single workflow. Different Jobs can be run depending on success or failure of the prior Playbook.



ANSIBLE TOWER

INTEGRATED NOTIFICATIONS

Stay informed of your automation status via **integrated notifications**. Connect Slack, Hipchat, SMS, email and more.

 **#prodOps Notification**
Prod Ops Complete!




NOTIFICATION TEMPLATES 1

+ ADD

NAME ▼

SEARCH

Q

NAME ▲	ACTIONS
<input type="radio"/> Prod Ops Complete	  

ITEMS 1-1 OF 1

Leverage Ansible from CloudForms

The screenshot displays the Red Hat CloudForms Management Engine interface. The top navigation bar includes a hamburger menu, the title "RED HAT CLOUDFORMS MANAGEMENT ENGINE", and a user profile "Administrator | EVM 41demomasterA". The left sidebar contains navigation links for Cloud Intel, Red Hat Insights, Services, Compute, and Configuration. The main content area is titled "All Configuration Management Providers" and contains a table with the following data:

	Provider Name	URL	Type	Zone	Last Refresh Date	Region Description	Status	Total Configured Systems
<input type="checkbox"/>	Ansible Tower Configuration Manager	https://10.3.48.240/api/v1	Configuration Manager (Ansible Tower)	default	06/22/16 15:10:59 MDT	Region 1	Valid	124
<input type="checkbox"/>	Satellite 6 Configuration Manager	10.3.49.238	Configuration Manager (Red Hat Satellite)	default	06/22/16 15:11:02 MDT	Region 1	Valid	1

Below the table, there are two overlapping windows. The first window, titled "Configuration Script 'JBoss EC2'", shows the "Properties" section with "Name" as "JBoss EC2" and "Region" as "Region 1". The "Variables" section lists "instance_id" and "ext_database_name". The "Surveys" section is empty. The second window, titled "Adding a new Service Catalog Item", shows the "Name / Description" field with "JBoss EC2 Playbook". The "Catalog" dropdown is set to "Hybrid Cloud Automation Items". The "Dialog" dropdown is set to "<No Dialog>". The "Provider" dropdown is set to "Ansible Tower Configuration Manager". The "Ansible Tower Job Template" dropdown is open, showing a list of templates including "JBoss EC2", which is highlighted. The "Provisioning Entry Point" field is set to "AWS ELB". The "Reconfigure Entry Point" field is set to "Elastic Deployment". The "Retirement Entry Point" field is set to "HelloWorld EC2".



<http://people.redhat.com/mkoch>

THANK YOU



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twitter.com/RedHatNews



youtube.com/user/RedHatVideos