

ANSIBLE REPORTING IN PRODUCTION



Lessons learned and ara v1.5

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Ansible Montreal/Québec | 30-09-2020

\$ WHOAMI

David Moreau-Simard

OpenStack Cloud Administrator @ Ubisoft

- Red Hat: Dev/Ops and CI/CD for >1000 projects
- iWeb: SysAdmin, hosting and cloud things
- User and contributor to Ansible since ~2014 (v1.8)
- ❤️ simplicity

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USE CASES

TESTING OPENSTACK IS HARD

A TALE ABOUT THE CI INVOLVED IN MAKING
RDO HAPPEN

DAVID MOREAU SIMARD

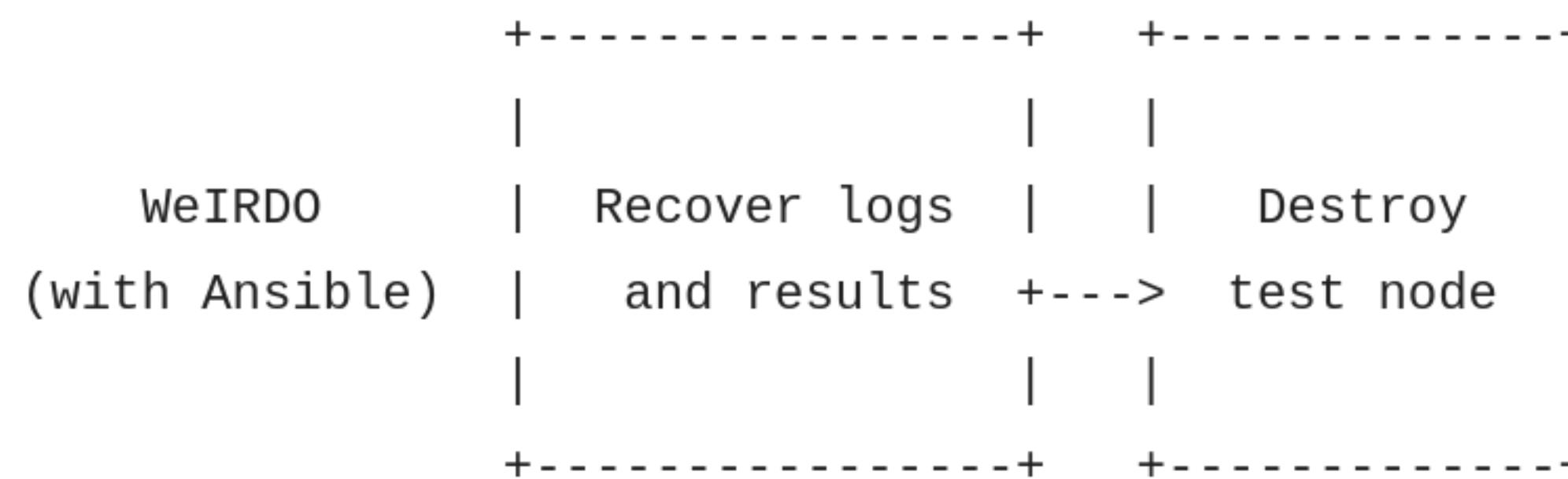
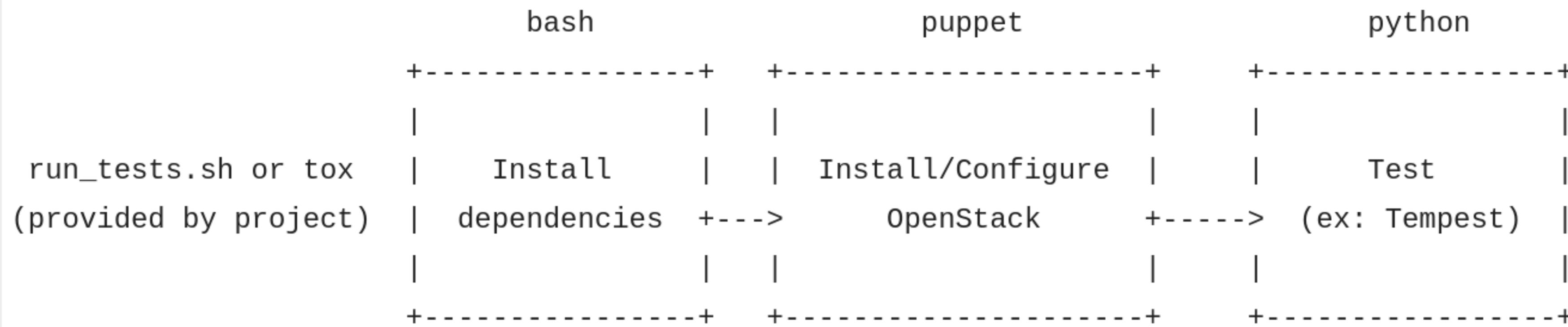
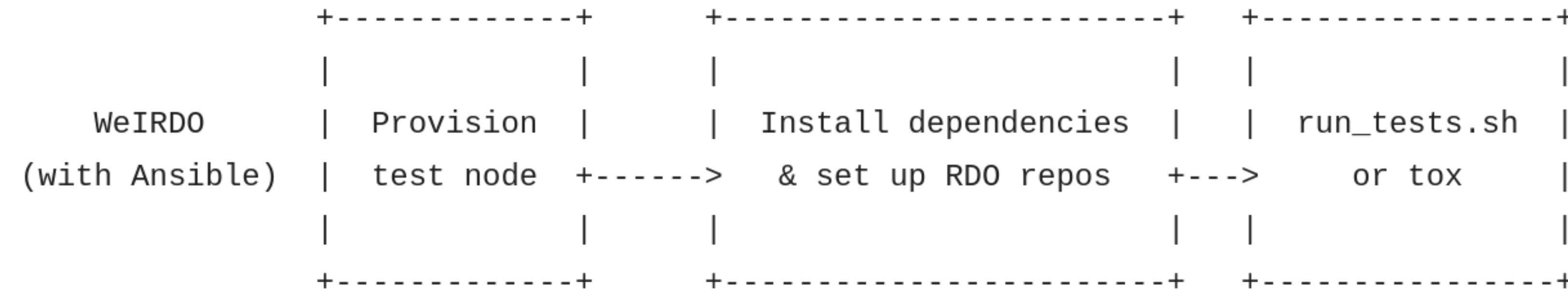
February 2016 @ OpenStack Montreal





- open source community openstack distribution
- ci jobs across jenkins and zuul environments
- not 100% ansible: bash, puppet & python

Zuul check		4:23 AM
puppet-openstack-lint-ubuntu-bionic		SUCCESS in 2m 51s
puppet-openstack-syntax-6-ubuntu-bionic		SUCCESS in 3m 02s
puppet-openstack-integration-6-scenario001-tempest-ubuntu-bionic-mimic		SUCCESS in 47m 43s (non-voting)
puppet-openstack-integration-6-scenario002-tempest-ubuntu-bionic		SUCCESS in 58m 11s (non-voting)
puppet-openstack-integration-6-scenario003-tempest-ubuntu-bionic		SUCCESS in 50m 21s (non-voting)
puppet-openstack-integration-6-scenario004-tempest-ubuntu-bionic-mimic		SUCCESS in 42m 51s (non-voting)
puppet-openstack-integration-6-scenario001-tempest-centos-8		SUCCESS in 1h 22m 33s
puppet-openstack-integration-6-scenario002-tempest-centos-8		SUCCESS in 1h 32m 45s
puppet-openstack-integration-6-scenario003-tempest-centos-8		SUCCESS in 1h 36m 44s
puppet-openstack-integration-6-scenario004-tempest-centos-8		SUCCESS in 58m 49s
Zuul gate		12:09 PM
puppet-openstack-lint-ubuntu-bionic		SUCCESS in 3m 06s
puppet-openstack-syntax-6-ubuntu-bionic		SUCCESS in 3m 54s
puppet-openstack-integration-6-scenario001-tempest-centos-8		SUCCESS in 1h 22m 21s
puppet-openstack-integration-6-scenario002-tempest-centos-8		SUCCESS in 1h 01m 26s
puppet-openstack-integration-6-scenario003-tempest-centos-8		SUCCESS in 1h 42m 38s
puppet-openstack-integration-6-scenario004-tempest-centos-8		SUCCESS in 1h 15m 44s



 Jenkins

Jenkins > rdo > weirdo > weirdo-generic-puppet-openstack-scenario002 >

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[Changes](#)

[Embeddable Build Status](#)

Project weirdo-generic-puppet-openstack-scenario002

Managed by Jenkins Job Builder. Do not edit via web.

This job runs [WeIRDO](#).

It runs the playbook [puppet-openstack-scenario002.yml](#)

This is a **parameterized** job that requires two variables: delorean_url and delorean_deps_url. This is what this job runs:

```
# If a properties file is specified, it should overwrite and have priority over other parameters
if [[ -n "${properties}" ]]; then
    curl -s -0 "${properties}"
    source "./$(basename ${properties})"
fi

# Use WeIRDO provided by jenkins scm
cd weirdo
git log -n 5 --oneline

tox -e ansible-playbook -- -i ${WORKSPACE}/hosts playbooks/puppet-openstack-scenario002.yml \
-e delorean_url=${delorean_url} \
-e delorean_deps_url=${delorean_deps_url} \
-e openstack_release=${openstack_release} \
-e version=${version} \
-e stable_repositories=${stable_repositories} \
-e trunk_repositories=${trunk_repositories} \
-e pending_repository=${pending_repository} \
-e testing_repository=${testing_repository} \
-e tempest_version=${tempest_version} \
-e tempest_from_source=${tempest_from_source} \
-e enable_puppet_modules_rpm=${enable_puppet_modules_rpm}
```

Last Successful Artifacts

	logs.html	694 B		view
	properties	2.98 KB		view

Index of /ci.centos.org/weirdo-generic-pup

<u>Name</u>	<u>Last modified</u>	<u>Size</u>
 Parent Directory		-
 ansible_hostvars.txt.gz	2020-09-26 20:34	37K
 ara-database/	2020-09-26 20:34	-
 ara/	2020-09-26 20:34	-
 audit/	2020-09-26 20:34	-
 cpuinfo.txt.gz	2020-09-26 20:34	779
 df.txt.gz	2020-09-26 20:33	224
 dmesg.txt.gz	2020-09-26 20:33	18K

	2020-09-27 22:45:55	destroy-vm.yml	⌚ 0:00:20	> Parameters	> 1 Hosts	> 1 Plays	> 1 Files	> ✓ 2 Tasks	> 0 Records
	2020-09-27 22:45:50	logs.yml	⌚ 0:00:03	> Parameters	> 1 Hosts	> 1 Plays	> 1 Files	> ✓ 3 Tasks	> 0 Records
	2020-09-27 22:45:47	prep-logs.yml	⌚ 0:00:01	> Parameters	> 1 Hosts	> 1 Plays	> 1 Files	> ✓ 1 Tasks	> 0 Records
	2020-09-27 21:21:25	puppet-openstack-scenario002.y...	⌚ 1:24:17	> Parameters	> 1 Hosts	> 4 Plays	> 9 Files	> ✓ 53 Tasks	> 0 Records

Tasks



Showing 1 to 25 of 53 Items						
Task	Host	Action	Elapsed	Duration	Status	
Gathering Facts	generic-puppet-openstack-002-16729	gather_facts	0:00:00	0:00:16	OK	
Enable PowerTools repo on CentOS8	generic-puppet-openstack-002-16729	shell	0:00:16	0:00:01	OK	
Stop services	generic-puppet-openstack-002-16729	service	0:00:18	0:00:01	IGNORED	
Remove services	generic-puppet-openstack-002-16729	package	0:00:19	0:01:03	CHANGED	
Restart networking	generic-puppet-openstack-002-16729	service	0:01:23	0:00:00	SKIPPED	



KOLLA

an OpenStack Community Project

- packages openstack in containers
- containers deployed with kolla-ansible
- support for centos, debian and ubuntu
- new patches tested with zuul

Change 368345 - Merged

Add ara to collect ansible playbook running statics

TrivialFix

Change-Id: Id2a13be9c04920b5326534005750286f842aa731

Signed-off-by: Jeffrey Zhang <zhang.lei.fly@gmail.com>

Author	Jeffrey Zhang <zhang.lei.fly@gmail.com>	Sep 10, 2016 2:41 PM
Committer	Jeffrey Zhang <zhang.lei.fly@gmail.com>	Sep 11, 2016 6:39 AM
Commit	cae4d364ad8808b8e650135638f3d443e8c35761	 (gitweb)
Parent(s)	ec5a90daeecc4e79a365bb2f6ba98171609daf467	 (gitweb)
Change-Id	Id2a13be9c04920b5326534005750286f842aa731	

✓ openstack/kolla / tools/**setup_gate.sh**

Patch Set Base 1 2 3 4 5 6 7 ⌂ (gitweb)
Patch Set 1 2 3 4 5 6 7 ⌂ (gitweb)
... skipped 114 common lines ... +10 ↴

```
115 115 mkdir /tmp/kolla
116 116
117 117 # TODO(SamYaple): Move to virtualenv
118 118 sudo -H pip install -U "ansible>=2" "docker-py>=1.6.0" "python-openstackclient" "python-neutronclient"
119 119 detect_distro
120 120
121 121 setup_inventory
122 122
123 123 # Record the running state of the environment as seen by the setup module
124 124 ansible all -i ${RAW_INVENTORY} -m setup > /tmp/logs/ansible/initial-setup
125 125
126 126 sudo pip install ara
127 127 sudo mkdir /etc/ansible
128 128 sudo tee /etc/ansible/ansible.cfg<<EOF
129 [defaults]
130 callback_plugins = /usr/lib/python2.7/site-packages/ara/callback:\$VIRTUAL_ENV/lib/python2.7/site-packages/ara/callback:/usr/local/lib/python2.7/dist-packages/ara/callback
131 EOF
132 }
133
134 function setup_node {
135     ansible-playbook -i ${RAW_INVENTORY} tools/setup_nodes.yml
136 }
137
138 function setup_logging {
139     # This directory is the directory that is copied with the devstack-logs
140     # publisher. It must exist at /home/jenkins/workspace/<job-name>/logs
141     mkdir logs
...
... skipped 13 common lines ...
```

File 3 of 3 ⌂ ⌃ ⌁

✓ openstack/kolla / tools/**deploy_aio.sh** File 2 of 3 ↶ ↷ ⚙

Patch Set Base 1 2 3 4 5 6 7 ⌂ (gitweb)

Patch Set 1 2 3 4 5 6 7 ⌂ (gitweb)

... skipped 15 common lines ...

```
16 16
17 17
18 18     if [[ -x "$(command -v journalctl)" ]]; then
19 19         journalctl --no-pager -u docker.service > /tmp/logs/system_logs/docker.log
20 20     else
21 21         cp /var/log/upstart/docker.log /tmp/logs/system_logs/docker.log
22 22     fi
23 23
24 24     # NOTE(SamYaple): Fix permissions for log extraction in gate
25 25     chmod -R 777 /tmp/logs/kolla /tmp/logs/kolla_configs /tmp/logs/system_logs
26 26     ara generate /tmp/logs/playbook_reports/
27 27 }
28 28
29 29 function sanity_check {
30 30     # Wait for service ready
31 31     sleep 15
32 32     source /etc/kolla/admin-openrc.sh
33 33     # TODO(Jeffrey4l): Restart the memcached container to cleanup all cache.
34 34     # Remove this after this bug is fixed
35 35     # https://bugs.launchpad.net/oslo.cache/+bug/1590779
36 36     docker restart memcached
+10↑ ... skipped 92 common lines ...
```

Playbook: /home/jenkins/workspace/gate-kolla-dsvm-deploy-centos-source-centos-7-nv/ansible/site.yml

2016-11-09 23:13:40 » 2016-11-09 23:15:45

 1 Hosts	 16 Plays	 263 Tasks	 47 Files	 0:02:04 Duration
--	---	--	---	---

Statistics

Host	OK	CHANGED	FAILED	SKIPPED	UNREACHABLE
localhost	109	42	1	153	0

Plays

Name	Start	End	Duration	
Gather facts for all hosts	2016-11-09 23:13:40	2016-11-09 23:13:42	0:00:01	details
all	2016-11-09 23:13:42	2016-11-09 23:13:49	0:00:06	details
ceph-mon,ceph-osd,ceph-rgw	2016-11-09 23:13:49	2016-11-09 23:13:51	0:00:02	details
collectd	2016-11-09 23:13:51	2016-11-09 23:13:53	0:00:01	details
elasticsearch	2016-11-09 23:13:53	2016-11-09 23:13:55	0:00:01	details
influxdb	2016-11-09 23:13:55	2016-11-09 23:13:57	0:00:01	details
telegraf	2016-11-09 23:13:57	2016-11-09 23:13:59	0:00:02	details
haproxy	2016-11-09 23:13:59	2016-11-09 23:14:20	0:00:21	details
libvirt	2016-11-09 23:14:20	2016-11-09 23:14:22	0:00:02	details



OPENSTACK-ANSIBLE

an OpenStack Community Project

- roles and playbooks to deploy openstack
- deployments against hosts and containers
- support for centos, debian and ubuntu
- large playbooks (>2000 tasks)

Change 463517 - Merged

Remove verbose Ansible logging (use ARA instead)

Currently all role playbook executions use very verbose logging in order to help with diagnosing problems in their execution.

ARA provides the most useful information available in the verbose log output, so instead of trawling very large logs we should instead use ARA's easier to navigate output.

Change-Id: Idea3c01f27b72c73fdbaf5ff96c24421f4d3fa28

Author	Jesse Pretorius <jesse.pretorius@rackspace.co.uk>	May 9, 2017 6:20 AM
Committer	Jesse Pretorius <jesse.pretorius@rackspace.co.uk>	May 9, 2017 6:20 AM
Commit	91df4bb5643c729f4af859fa60ad24e3d5d4ab9c	 (gitweb)
Parent(s)	327d134632732579bd570daba3fe772666e5e243	 (gitweb)
Change-Id	Idea3c01f27b72c73fdbaf5ff96c24421f4d3fa28	

```
37 37 export ANSIBLE_CALLBACK_WHITELIST="profile_tasks"
38 38 export ANSIBLE_OVERRIDES=${ANSIBLE_OVERRIDES:-$WORKING_DIR/tests/$ROLE_N}
39 | export ANSIBLE_PARAMETERS=${ANSIBLE_PARAMETERS:--"vvv"}
| 39 export ANSIBLE_PARAMETERS=${ANSIBLE_PARAMETERS:--""}
40 40 export TEST_PLAYBOOK=${TEST_PLAYBOOK:-$WORKING_DIR/tests/test.yml}
```

Before:

```
$ curl http://logs.openstack.org/81/462581/3/check/gate-openstack-ansible-tests-ansible-func-centos-7/66c86a4/console.html.gz |wc -l
7307k
56421
```

After:

```
$ curl http://logs.openstack.org/17/463517/1/check/gate-openstack-ansible-tests-ansible-func-centos-7/78db57a/console.html |wc -l
392k
4255
```



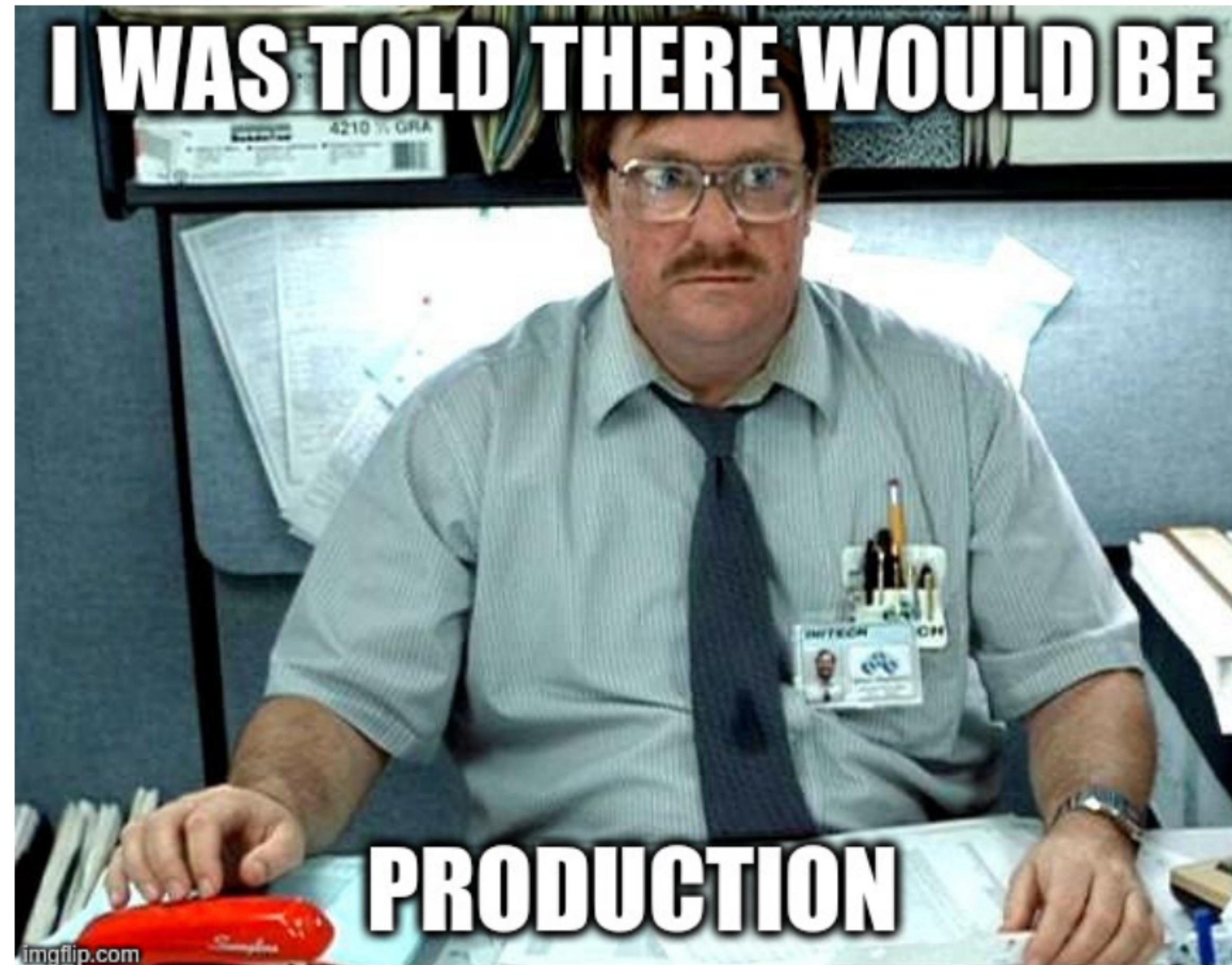
- ci/cd jobs written as Ansible roles and playbooks
- over 300 000 ci jobs per month
- workloads across multiple providers/clouds
- hundreds or thousands of tasks
- single or multi-node

STATIC REPORT GENERATION

- works, convenient but inefficient at scale
- lots of small files: 2000 tasks result in 2000+ files
- need to generate and upload files for every job

DISTRIBUTED SQLITE BACKEND

- one small database per job
- dynamically served from any "ara-report" directory
- no database cluster to manage
- no network latency
- sqlite is often good enough
- with >1.x, this is now an API endpoint too



UBISOFT CLOUD



A BRIEF HISTORY OF OPENSTACK @ UBI

2020

ENVIRONMENT

- 1100** Compute nodes
 - HPE + Dell hardware
 - Local NVMe storage
- ~9000** Instances
- ~250 TB** block storage
 - many PB of local storage
- ~6 PB** object storage
- Stein** Version
- 18** People

SERVICES

- Compute**
- GPU Cloud**
 - ML/AI
 - Rendering (soon)
- Block Storage**
- Object Storage**
- Octavia Load-balancer**

REGIONS

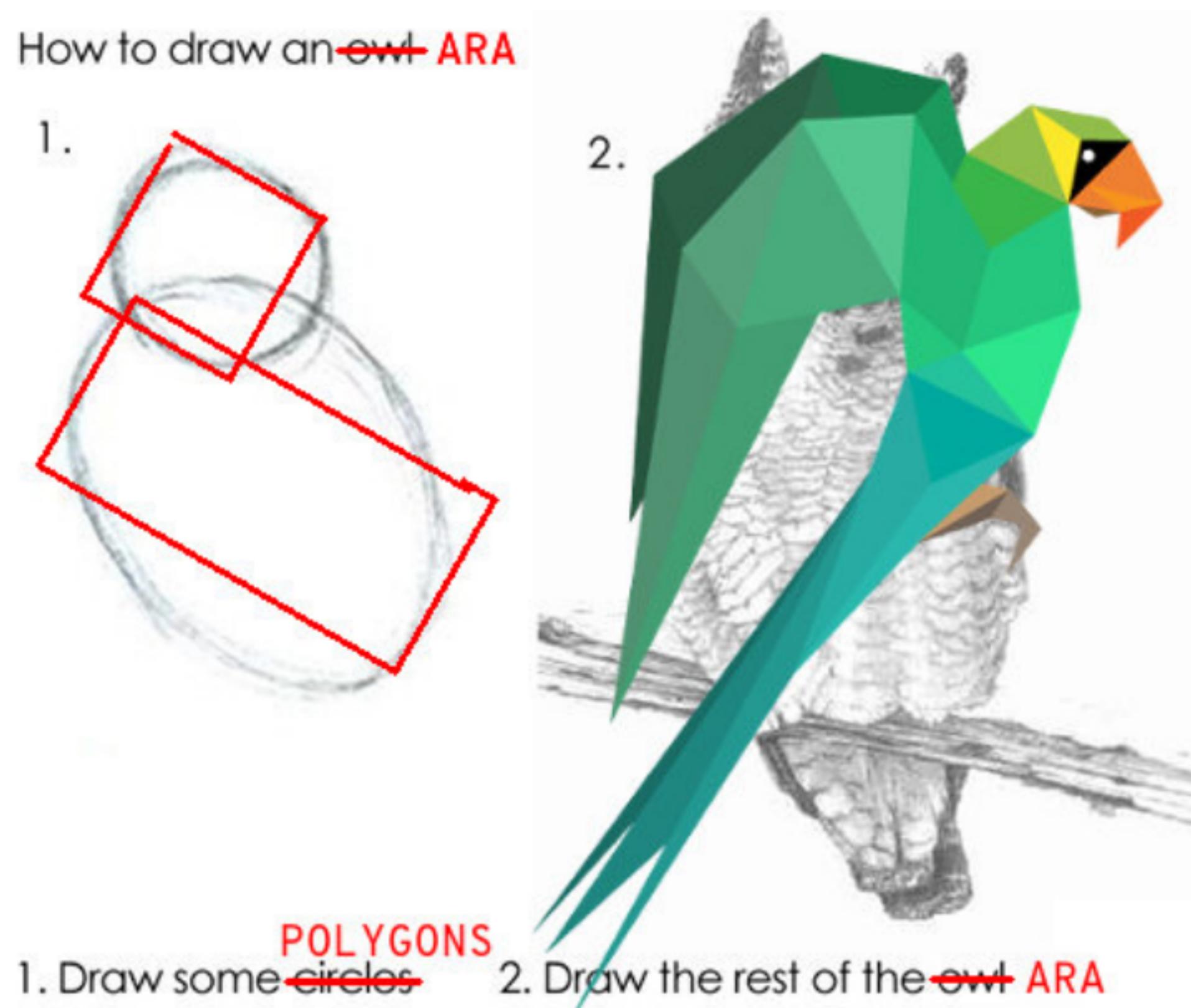
- Montreal** x6
- Paris** x3
- Singapore**
- Hong-Kong**
- Rotterdam (wip)**
- San-Francisco (wip)**

- large inventory (>1000 bare metal hosts)
- globally distributed
- ci/cd with gitlab pipelines
- no awx (yet!)
- kolla-ansible and home-made playbooks
- not just openstack
- networking, logging, monitoring, etc

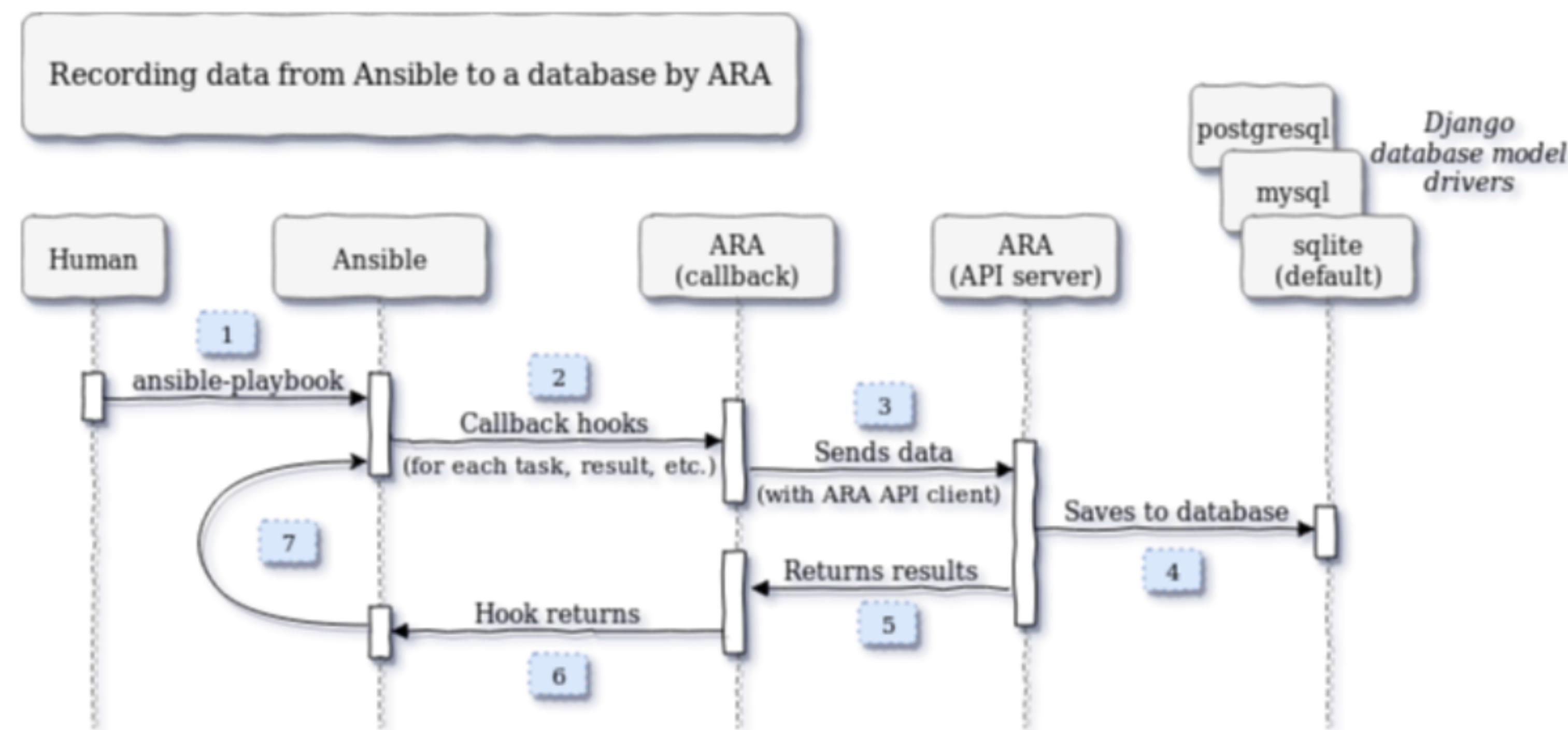
SO MUCH DATA

Status	Date	Duration	Ansible version	Name (or path)	Labels	Hosts	Plays	Results	Files	Records	
✓	25 Sep 2020 17:59:00 +0000	02:18:01.07	2.9.13	/builds/iaas/prod/uc-base/playbooks/site.yml	<code>uc-base</code> <code>emea-west-pdc-z01</code> <code>gitlab</code> <code>prod</code> <code>check</code> <code>check:True</code> <code>tags:all</code> <code>remote_user:root</code> <code>skip_tags:docker</code>	93	400	25394	236	0	▶ CLI arguments
✓	25 Sep 2020 17:02:29 +0000	01:37:13.57	2.9.13	/builds/iaas/prod/uc-base/playbooks/site.yml	<code>uc-base</code> <code>ncsa-east-ne1-z01</code> <code>gitlab</code> <code>prod</code> <code>check</code> <code>check:True</code> <code>tags:all</code> <code>remote_user:root</code> <code>skip_tags:docker</code>	77	331	20990	237	0	▶ CLI arguments
✓	25 Sep 2020 17:01:46 +0000	01:17:36.77	2.9.13	/builds/iaas/prod/uc-base/playbooks/site.yml	<code>uc-base</code> <code>apac-southeast-ae1-z01</code> <code>gitlab</code> <code>prod</code> <code>check</code> <code>check:True</code> <code>tags:all</code> <code>remote_user:root</code> <code>skip_tags:docker</code>	28	140	7590	236	0	▶ CLI arguments
!	25 Sep 2020 16:57:17 +0000	01:32:40.41	2.9.13	/builds/iaas/prod/uc-base/playbooks/site.yml	<code>uc-base</code> <code>ncsa-east-ne1-z02</code> <code>gitlab</code> <code>prod</code> <code>check</code> <code>check:True</code> <code>tags:all</code> <code>remote_user:root</code> <code>skip_tags:docker</code>	74	319	19894	237	0	▶ CLI arguments
✓	25 Sep 2020 16:51:39 +0000	01:20:09.01	2.9.13	/builds/iaas/prod/uc-base/playbooks/site.yml	<code>uc-base</code> <code>ncsa-east-ne1-z03</code> <code>gitlab</code> <code>prod</code> <code>check</code> <code>check:True</code> <code>tags:all</code> <code>remote_user:root</code> <code>skip_tags:docker</code>	59	262	16082	237	0	▶ CLI arguments

HOW DOES IT WORK ?



RECORDING WORKFLOW



with or without running an API server

```
#!/usr/bin/env python3
# Requires ara[server] to be installed
from ara.clients.offline import AraOfflineClient

client = AraOfflineClient()
playbooks = client.get("/api/v1/playbooks")
```

with or without running an API server

```
#!/usr/bin/env python3
# Requires ara to be installed
from ara.clients.http import AraHttpClient

client = AraHttpClient(endpoint="https://api.demo.recordsansible.org")
playbooks = client.get("/api/v1/playbooks")
```

GETTING STARTED

no API server with the default sqlite backend

```
# Install Ansible and ARA (with API server dependencies) for the current user
python3 -m pip install --user ansible "ara[server]"

# Configure Ansible to use the ARA callback plugin
export ANSIBLE_CALLBACK_PLUGINS="$(python3 -m ara.setup.callback_plugins)"

# Run an Ansible playbook
ansible-playbook playbook.yaml

# Use the CLI to see recorded playbooks
ara playbook list

# Start the built-in development server to browse recorded results
ara-manage runserver
```

GETTING STARTED

with a containerized API server

```
# Create a directory for a volume to store settings and a sqlite database
mkdir -p ~/.ara/server

# Start an API server with podman from the image on DockerHub:
podman run --name api-server --detach --tty \
--volume ~/.ara/server:/opt/ara:z -p 8000:8000 \
docker.io/recordsansible/ara-api:latest

# or with docker:
docker run --name api-server --detach --tty \
--volume ~/.ara/server:/opt/ara:z -p 8000:8000 \
docker.io/recordsansible/ara-api:latest
```

GETTING STARTED

configuring the callback to send data to our server

```
# Install Ansible and ARA (without API server dependencies) for the current user
python3 -m pip install --user ansible ara

# Configure Ansible to use the ARA callback plugin
export ANSIBLE_CALLBACK_PLUGINS="$(python3 -m ara.setup.callback_plugins)"

# Set up the ARA callback to know where the API server is located
export ARA_API_CLIENT="http"
export ARA_API_SERVER="http://127.0.0.1:8000"

# Run an Ansible playbook
ansible-playbook playbook.yaml

# Use the CLI to see recorded playbooks
ara playbook list

# Browse http://127.0.0.1:8000 to view the reporting interface
```

Live demo !

<https://api.demo.recordsansible.org>

<https://asciinema.org/a/4XckNTJcSEjBjl8MduH175GA1>

THANK YOU !



<https://github.com/ansible-community/ara>

<https://ara.recordsansible.org/blog/2020/09/23/announcing-the-release-of-ara-1.5.0/>

- Docs: <https://ara.readthedocs.org>
- Twitter: [@RecordsAnsible](https://twitter.com/RecordsAnsible)
- IRC: #ara on freenode
- Slack: <https://ara.recordsansible.org/community>