Ansible Inventory for Fun and Profit

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inventory

/ˈɪnvəntərē/
noun
[c.] a detailed list of all the things in a place

Cambridge Dictionary
List of hosts to target

- Connection metadata (usually)
- Host groupings (logical/physical/functional)
- Group/host-specific vars to augment task behavior
Who am I?
Inventory types

- Un-inventory
- Implicit
- Static
- Dynamic
- REALLY dynamic
Host list "inventory"

- quick/dirty adhoc commands
- 2+ hosts or needs a trailing comma

```bash
ansible all -i host1,host2,host3 -m ping
```
Implicit inventory

- Built-in localhost / 127.0.0.1
  - cloud modules, "self management"
- Can hackily manage other hosts
  - please don't...
Implicit Inventory Demos

local_only
nonlocal
Most common
ini/yaml/toml
  *please* don't use /etc/ansible/hosts
Supports host range expansion
Static inventory demos

static.ini, static.yml, static.toml
ansible-inventory
rangedemo.ini
Dynamic Inventory

- Runtime-generated inventory (cloud, hypervisor, any external source of truth)
- Types:
  - inventory scripts
  - new inventory plugins
  - *psst*, it's inventory plugins all the way down
About Inventory Scripts

- Ancient...
- Not distributed with Ansible
  - [https://github.com/ansible/ansible/tree/devel/contrib/inventory](https://github.com/ansible/ansible/tree/devel/contrib/inventory)
- Written in any language
  - Just has to dump JSON to stdout
Using Inventory Scripts

- Copy 1-N scripts to inventory dir
  - can have multiple copies with different names
  - eg, azure-dev.py, azure-prod.py
- Create config file(s)
  - Config varies wildly for each script
Using Inventory Plugins

- Many are shipped/maintained with Ansible
  - `ansible-doc -t inventory -l`
  - or use your own from a collection or `inventory_plugins/` dir
- Create 1-N inventory configs in your inventory dir
  - Usually `(whatever).(plugin_name).yml`, check docs
  - `plugin: (plugin_name)` in config file
- Most support dynamic group/var generation
  - More on this during the demo...
Dynamic Inventory Demos

dummy C# script
virtualbox dynamic plugin
Dynamic Inventory - Script or Plugin?

Script
● pros
  ○ self-contained
  ○ any language
● cons
  ○ self-contained
  ○ no (reliable) code-sharing
  ○ no self-documentation
  ○ can't see/modify existing inventory
  ○ not distributed with Ansible
  ○ one copy per "configuration", easy to drift
Dynamic Inventory - Script or Plugin? (cont'd)

Plugin

- **pros**
  - updates w/ Ansible codebase
  - share code/base classes
  - self-documenting
  - can mutate/augment existing inventory
  - N declarative config files
  - 0-1 copies of code instead of N

- **cons**
  - more complex to write
  - Python-only
Dynamic Inventory - Script or Plugin? (cont'd)

- Built-in? Use plugins...
  - active maintenance/enhancements, tests
- Custom? Choose what works for you...
- Neither is going anywhere
Composed/Hybrid Inventories

- "You got your static in my dynamic!"
  - Best of both worlds; use static stubs to augment dynamic
- Same host/group more than once? No problem...
  - It's not a bug, it's a feature!
- Specify -i multiple times
- Point at directory(s)
  - Use dirs to segment inventories
  - Files are processed alphabetically
  - Can also use host_vars/group_vars in inventory dir
Composed Hybrid Inventory Demo

vbox_hybrid
really dynamic inventory

- **add_host**
  - create hosts/groups during playbook run

- **group_by**
  - create groups based on values

- **useful for cloud provisioning**
  - eg, cloud module creates host, then Ansible provisions
REALLY Dynamic Inventory Demo

newhost_really_dynamic w/ add_host
Inventory Refresh

- `meta: refresh_inventory`
- Another way to deal with new hosts during run
  - Assuming you're using dynamic inventory
Inventory Refresh Demo
Inventory Abstraction

- Content should be inventory-agnostic!
  - Same Ansible content in dev/test/staging/prod, just different inventories...

- Wait, you're not doing it that way?
HI. YOU'RE DOING IT WRONG.
Use roles to separate provisioning from config/deployment
  ○ Target groups - who cares where they live?
Use separate inventories for separate envs
  ○ What's the largest set you'd ever manage at once?
Use localhost (or surrogate local) for control vars
  ○ {{ hostvars['somehost'].cloud_type }}
Recap

● Lots of inventory types
  ○ None, implicit, static, dynamic, runtime dynamic
  ○ Mix and match as needed with directories or multiple -i

● Segment inventories by function
  ○ "One inventory to rule them all" is usually a bad idea

● Use inventory abstraction
  ○ Same content in all envs, just swap the inventory!
Questions?

github.com/nitzmahone/inventory_talk
#ANSIBLEFEST2019

THANK YOU

youtube.com/AnsibleAutomation   facebook.com/ansibleautomation
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