ANSIBLE

Introduction to Ansible Collections

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Agenda

- What is a Collection?
- What problems collection solve?
- Deep dive with Collections
- Collection demo
- Ansible galaxy for Collections
- Reference for Collection

About me - Abhijeet

- Free and Open Source software evangelist
- Senior Software Engineer at Ansible by Red Hat
- Works primarily as maintainer for Ansible VMware and cloud related modules
- Co-host for Ansible Pune meetup group

About me - Ganesh

- Principal Software Engineer at Ansible by Red Hat
- Work primarily as upstream developer in Ansible Networking
- Worked extensively on Network management plane developing

software for on/box automation and programmability infra.

- Co Organiser for Ansible Pune meetup group

What’s a Collections?

- Bundle of Ansible content
    - Any kind of plugins
    - modules
    - module_utils
    - roles
    - playbooks (TBD)

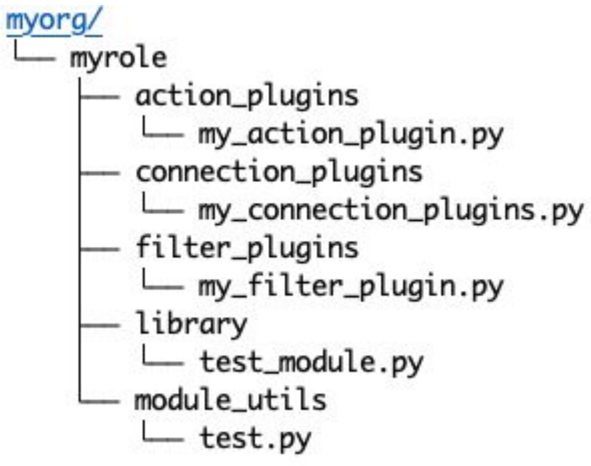
- With a namespace + name

What problem Collections solve?

- Difficult distribution of non-role content
- Plugin/role name collisions
- Difficult to do code-sharing for most plugins
- Vendor is the owner of content

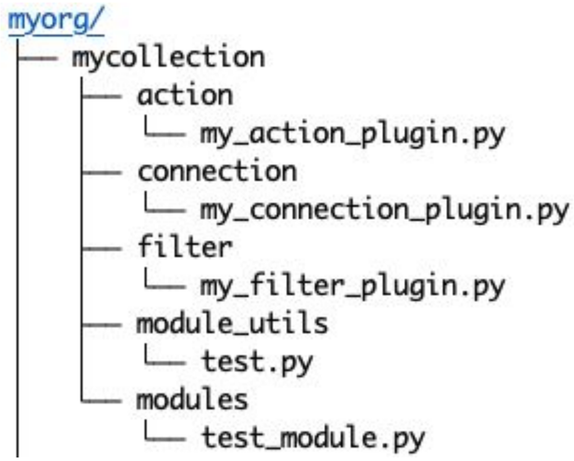
Role structure vs Collection structure example

Role Structure



```
myorg/
└── myrole
    ├── action_plugins
    │   └── my_action_plugin.py
    ├── connection_plugins
    │   └── my_connection_plugins.py
    ├── filter_plugins
    │   └── my_filter_plugin.py
    ├── library
    │   └── test_module.py
    └── module_utils
        └── test.py
```

Collection Structure



```
myorg/
├── mycollection
│   ├── action
│   │   └── my_action_plugin.py
│   ├── connection
│   │   └── my_connection_plugin.py
│   ├── filter
│   │   └── my_filter_plugin.py
│   ├── module_utils
│   │   └── test.py
│   └── modules
│       └── test_module.py
```

Problem 1: Content Distribution

- Multiple roles with dependencies
  - Maintain version dependencies across roles and Ansible version

- Roles already distribute plugins but the problem is
  - Requires role to be “entered” to use plugin content
  - Plugins are not “first-class citizens” within as compared to shipping plugins in Ansible
  - Versioning/maintenance issues

Content Distribution with Collections

- Collection may contain 1-N:
  - Roles/Modules/Plugins
  - Playbooks (TBD)

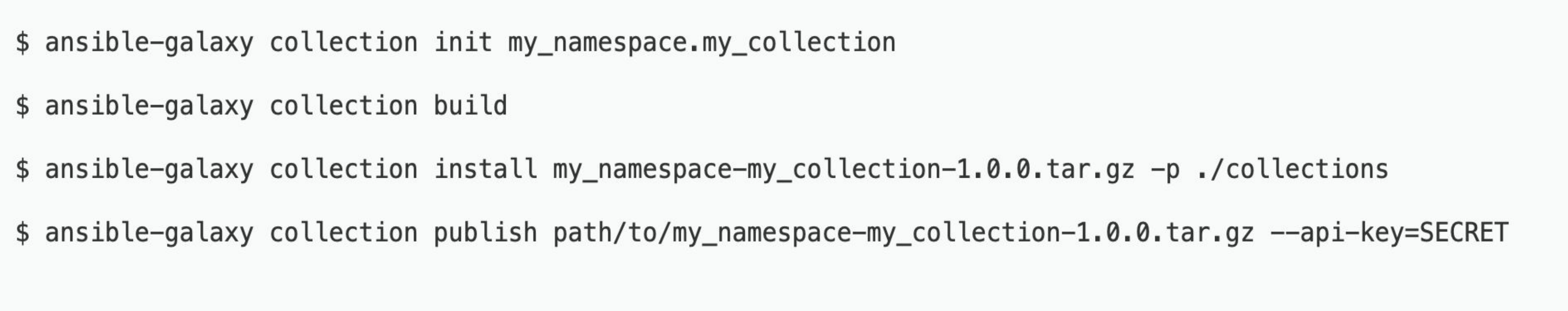
- Collection is the unit of distribution and versioning

- Installable:
  - globally
  - per-user
  - content-adjacent (ie per-project)

Installing collections content

- Default paths (searched in this order)
  - (current playbooks)/collections
  - ~/.ansible/collections
  - /usr/share/ansible/collections

- ansible-galaxy can be used to create/install/distribute collections
  - Supported from Ansible 2.9 onwards



```
$ ansible-galaxy collection init my_namespace.my_collection

$ ansible-galaxy collection build

$ ansible-galaxy collection install my_namespace-my_collection-1.0.0.tar.gz -p ./collections

$ ansible-galaxy collection publish path/to/my_namespace-my_collection-1.0.0.tar.gz --api-key=SECRET
```

Problem 2: Name Collisions

- Ansible has a global flat plugins namespace

- Role1 and Role2 both distribute my_module
  - Which one will get used?
  - Can I use both of them in same run? (no)
  - If ansible core later includes a my_module?
  - What if project has in library/?
  - What if the system has ib /usr/share/ansible?
  - Issue exists for roles and all modules/plugins

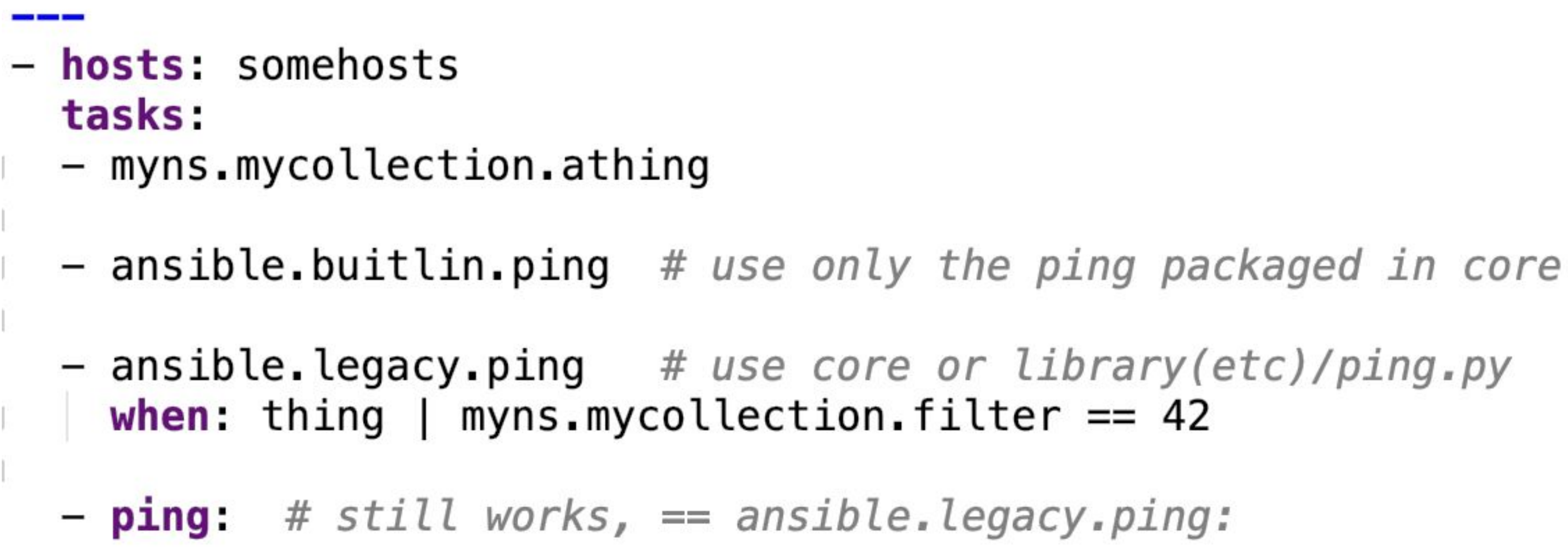
Namespacing with Collections

- Collections have a namespace and name
  - For distribution, namespace == Galaxy user/org

- Content is collections is accessed by namespace
  - mynamespace.mycollection.my_module
  - f5.bigip.provisioning_role

- Built-in collections
  - ansible.builtin
  - ansible.legacy

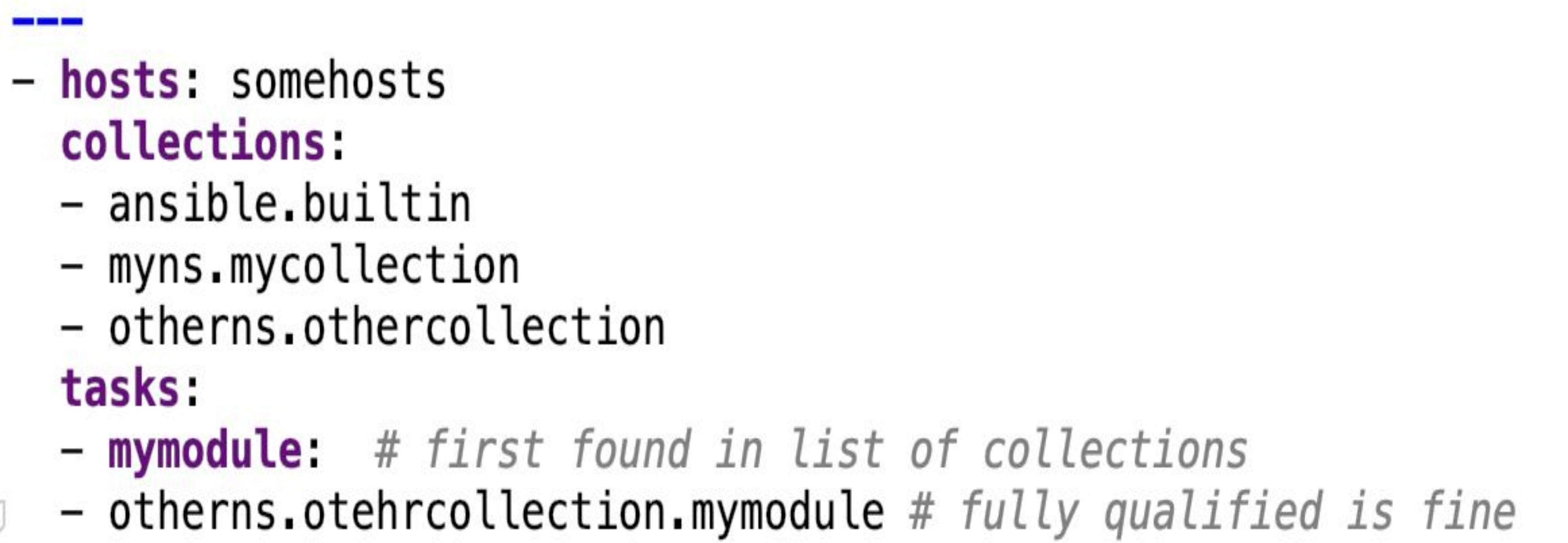
Sample playbooks



```
---
- hosts: somehosts
  tasks:
  - myns.mycollection.athing

  - ansible.buitlin.ping  # use only the ping packaged in core

  - ansible.legacy.ping   # use core or library(etc)/ping.py
    when: thing | myns.mycollection.filter == 42

  - ping:  # still works, == ansible.legacy.ping:
```

That’s awfully verbose

Enter the collections keyword



```
---
- hosts: somehosts
  collections:
  - ansible.builtin
  - myns.mycollection
  - otherns.othercollection
  tasks:
  - mymodule:  # first found in list of collections
  - otherns.otehrcollection.mymodule # fully qualified is fine
```

collections keyword

- Ordered list of collections for unqualified name
- ansible.legacy auto-appended
  - if ansible.builtin or ansible.legacy isn’t explicitly listed
  - eases adding collection search to existing plays
- settable on plays/blocks/tasks

Problem 3: Code sharing

- module_utils in roles only works for modules
  - inventory plugins can’t use module_utils code
  - unless you’re using ansible shipped code

Code sharing in collections

- Entire collection is a Python namespace package

- All installed collection content is accessible
  - even across collections!
  - ansible_collections root Python namespaces
  - ansible_collections.mynamespace.mycollection

Collections

DEMO

Collections with Ansible-galaxy

- Collection support with ansible-galaxy (2.9)

Contributing to Ansible

- Slides and demo (https://github.com/ganeshrn/ansible_collections_demo)

- Community groups

- IRC channels

- Google Groups:
  https://groups.google.com/forum/#!forum/ansible-project
  https://groups.google.com/forum/#!forum/ansible-devel

- Ansible galaxy

Thank You

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