

# ICA0002: IT Infrastructure Services

## Ansible Basics

Roman Kuchin  
Juri Hudolejev  
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# Files from previous lab

```
roles/  
  test_connection/  
    tasks/  
      main.yaml  
ansible.cfg  
hosts  
infra.yaml
```

# Files from previous lab

## `roles/`

Directory where all our infrastructure service roles are stored

Role defines a service type: web server, database server, mail server etc.

Each role is defined in its own subdirectory and should contain a file `tasks/main.yaml`

## `roles/test_connection/`

Custom role we have created to test Ansible setup

# Files from previous lab

`roles/test_connection/tasks/main.yaml`

YAML file, list of tasks for `test_connection` role

For every server that has this role assigned,  
every task from this role is executed

## Task

Action to ensure that certain element (file, service etc.) is in desired state

On task execution Ansible will change the element state -- if needed

# Ansible task example

```
name: Ansible ping module  
ansible.builtin.ping:
```

Where

`name` is free text task identifier for better readability

`ansible.builtin.ping` is Ansible module call

Note the colons! '`ping:`' means 'module `ping`, no parameters'.

# Another Ansible task example

Ensures that Linux user with login 'elvis' exists; creates one if not:

```
name: Linux user
```

```
ansible.builtin.user: ← Ansible module to manage OS users
```

```
  name: elvis          ← Module parameter named 'name'  
                        with value 'elvis'; note the indent!
```

All Ansible modules:

[https://docs.ansible.com/ansible/latest/collections/index\\_module.html](https://docs.ansible.com/ansible/latest/collections/index_module.html)

# Yet another Ansible task example

Ensures both APT packages `curl` and `wget` are installed; installs if not:

```
name: HTTP client packages
```

```
ansible.builtin.apt:
```

```
  name:
```

- `curl`
- `wget`

# And another Ansible task example

Ensures local file is copied to a managed host; copies if not:

```
name: Really important file (no)
```

```
ansible.builtin.copy:
```

```
  src: foo.txt
```

```
  dest: /srv/foo.txt
```

Note: file `files/foo.txt` must exist in the role directory for this to work:

```
roles/my_role/files/foo.txt
```

```
roles/my_role/tasks/main.yaml
```



# Files from previous lab

`infra.yaml`

Playbook, YAML file, list of plays

Ansible execution entry point

Play

Maps a group of roles to a group of servers (hosts)

Ansible plays and playbooks:

[https://docs.ansible.com/ansible/latest/user\\_guide/playbooks\\_intro.html](https://docs.ansible.com/ansible/latest/user_guide/playbooks_intro.html)

# Ansible play example

Assigns role `test_connection` to `foo-1` host:

```
name: Ansible connection test
hosts: foo-1
roles:
  - test_connection
```

# Another Ansible play example

Assigns multiple roles to every defined host named 'web\*' -- **web-1**, **web-2** etc.:

```
name: Public web servers
```

```
hosts: web*
```

```
roles:
```

- firewall
- nginx

# Ansible playbook example

- name: Database servers  
hosts: db\_servers  
roles:
  - mysql
- name: Web servers  
hosts: web\_servers  
roles:
  - nginx

Playbook is just a list of several plays -- may contain 0, 1 or more plays

# YAML

Human readable data serialization language with minimal syntax

key: value	# map keys are followed by ':' and optional value
foo:	# maps can include other maps
bar: 0.42	# numbers are written as is
list:	# comments start with '#'
- one element	# list elements start with '-'
- another element	# indents are important!

More info: <https://yaml.org>

Not all Ansible files are YAML files!

# Files from previous lab

## hosts

Inventory file, high-level overview of your entire infrastructure:

- List of servers
- Server groups
- Sometimes server variables: connection parameters etc.

Format -- flavor of INI (other formats also supported):

```
[my_group]
```

```
server-name  param=value  another_param=another_value  ...
```

# Ansible inventory file example

```
[db_servers]
```

```
db-1    ansible_host=10.10.10.37
```

```
[web_servers]
```

```
web-1   ansible_host=10.10.10.13  ansible_port=9522
```

```
web-2   ansible_host=10.10.10.14  ansible_port=9622
```

```
[all:vars]
```

```
ansible_user=ansible
```



# Ansible inventory file location

In this course: file named `hosts` in your repository

Default location: `/etc/ansible/hosts` ← do not use

More about Ansible inventory:

[https://docs.ansible.com/ansible/latest/user\\_guide/intro\\_inventory.html](https://docs.ansible.com/ansible/latest/user_guide/intro_inventory.html)

# Files from previous lab

## `ansible.cfg`

Ansible configuration file -- changes some aspects of Ansible behavior

So far (lab 1..2) our Ansible configuration file only instructs Ansible to fetch the inventory from the same directory:

```
[defaults]
```

```
inventory = ./hosts
```

We will improve Ansible configuration file later during this course

# Ansible configuration file format

Flavor of INI format:

```
[section_name]  
key_name = value  
another_key_name = another_value
```

```
[another_section_name]  
...
```

More about Ansible configuration:

[https://docs.ansible.com/ansible/latest/reference\\_appendices/config.html](https://docs.ansible.com/ansible/latest/reference_appendices/config.html)

# Ansible configuration file locations

**ansible.cfg** (root of your repository)

Project specific configuration

**~/.ansible.cfg** (your home directory)

User specific configuration for all projects on this machine

**/etc/ansible/ansible.cfg**

Global configuration for all users on this machine

# Ansible configuration file locations

**ansible.cfg**

← go for it

Project specific configuration

**~/.ansible.cfg**

← do not use

User specific configuration for all projects on this machine

**/etc/ansible/ansible.cfg**

← do not use

Global configuration for all users on this machine

# Summary

roles/

  nginx/

    files/index.html

    tasks/main.yaml

  users/

    tasks/main.yaml

ansible.cfg

hosts

infra.yaml

← will add more roles on every lab

← will add a few lines

← will change daily

← will add more plays on every lab

Questions?