Creating Namespace in Kuberenetes with Execution-Environment image using Docker

Execution-Environment:

An execution environment packages everything needed - like Ansible, Python, and dependencies ,roles and collections into a container.

- Ansible Builder is used to create Execution Environment.
- In our host VM we have to install Ansible-Builder.

Prerequisites:

- Python(>=3.9):

```
sudo add-apt-repository ppa:deadsnakes/ppa
sudo apt update
sudo apt install python3.9
```

Make python3 --version default version as recently installed version only

```
sudo update-alternatives --install /usr/bin/python3 python /usr/bin/python3.9 1
sudo update-alternatives --config python3
python3 --version
```

- Ansible:

```
pip3 install ansible
ansible --version
```

- Ansible-Builder(version :3):

```
pip3 install ansible-builder
ansible-builder –version
```

- Docker:

```
sudo apt update
curl -fsSL get.docker.com | /bin/bash
sudo usermod -aG docker root
```

To create Execution Environment image we need to execution-environment.yml file.

vi execution-environment.yml

```
---
version: 3
build_arg_defaults:
  ANSIBLE_GALAXY_CLI_COLLECTION_OPTS: '--pre'
dependencies:
  ansible_core:
    package_pip: ansible-core
  ansible_runner:
    package_pip: ansible-runner
  galaxy: requirements.yml
  python:
    - six
    - psutil
    - kubernetes
  exclude:
    python:
      - docker
    system:
      - python3-Cython
additional_build_files:
```

```
  - src: play.yml
    dest: project
    # Other available base images:
    #   - quay.io/rockylinux/rockylinux:9
    #   - quay.io/centos/centos:stream9
    #   - registry.fedoraproject.org/fedora:38
    #   - registry.redhat.io/ansible-automation-platform-23/ee-minimal-rhel8:latest
    #     (needs an account)
additional_build_steps:
  append_final:
    - RUN mkdir -p /etc/project   # Create a project directory if needed
    - COPY _build/project/play.yml /etc/project/play.yml   # Adjust this path as needed
```

vi requirements.yml

```
---
collections:
  - name: community.windows
  - name: ansible.utils
    version: 2.10.1
  - name: kubernetes.core
```

Playbook to create namespace:

vi play.yml

```
---
- name: Create Kubernetes Namespace
  hosts: localhost
  gather_facts: no
  vars:
```

```
    ansible_python_interpreter: /usr/bin/python3
  tasks:
    - name: Create a namespace
      kubernetes.core.k8s:
        api_version: v1
        kind: Namespace
        name: my-namespace
        state: present
      register: result
      environment:
        KUBECONFIG: /project/kube-config
    - name: Display the result
      debug:
        var: result
```

To create execution-environment image:

- ansible-builder build

This command creates a ansible-execution-env image(verify by using {docker images})

In current directory it creates context folder inside it a Dockerfile and _build directory will present.

To start container using Docker:

kube-config file should be in test folder

- docker run -v $(pwd)/test:/project/ --workdir /project/ ansible-execution-env ansible-playbook /etc/project/play.yml(verify by {docker ps -a})