

Open Source MANO

What are day-2 operations

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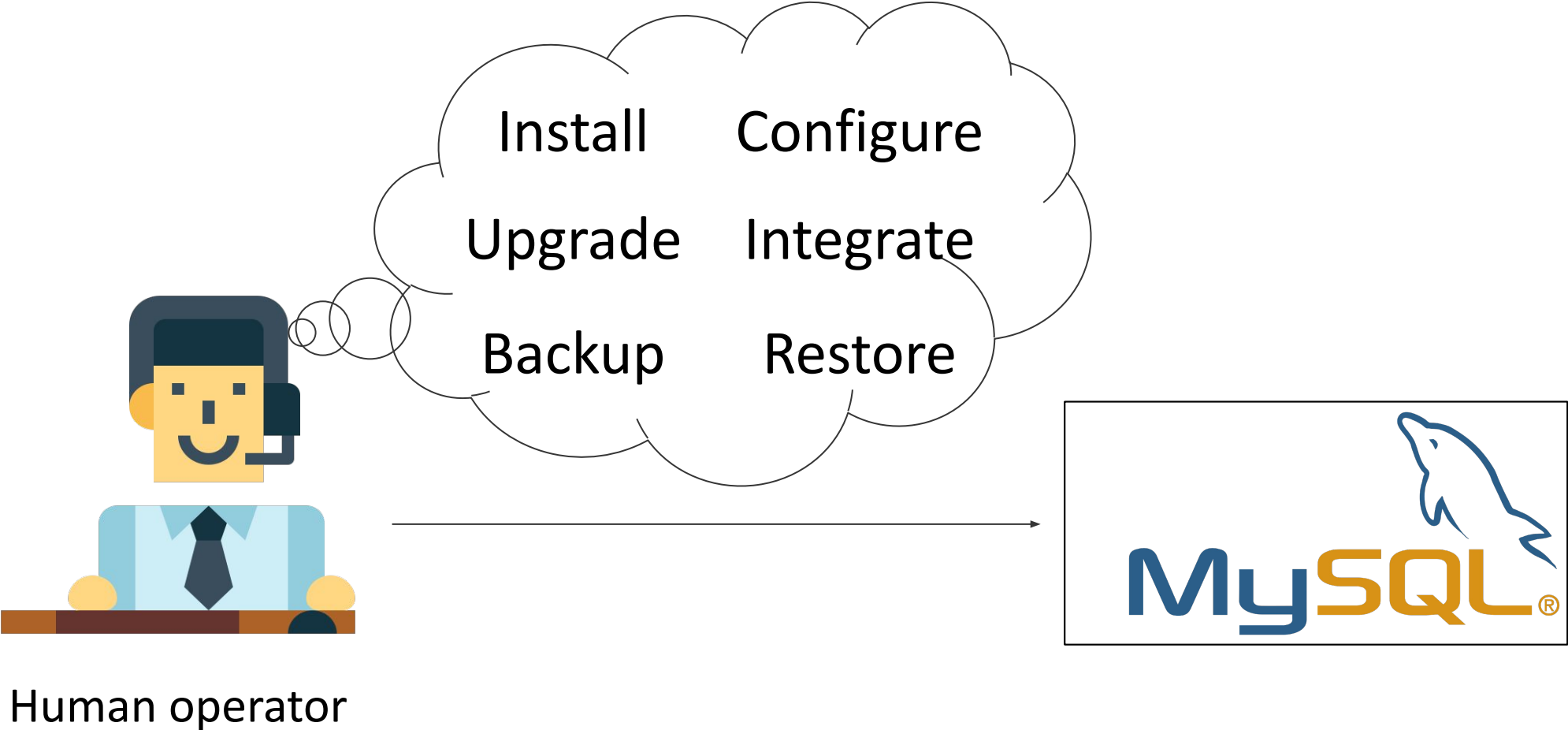
1. What are day-2 operations?
2. Day-2 operations in OSM
3. Charms
 - a. Basics
 - b. K8s
 - c. Actions
 - d. Relations and libraries
 - e. Build
4. What's next?

What are day-2 operations?

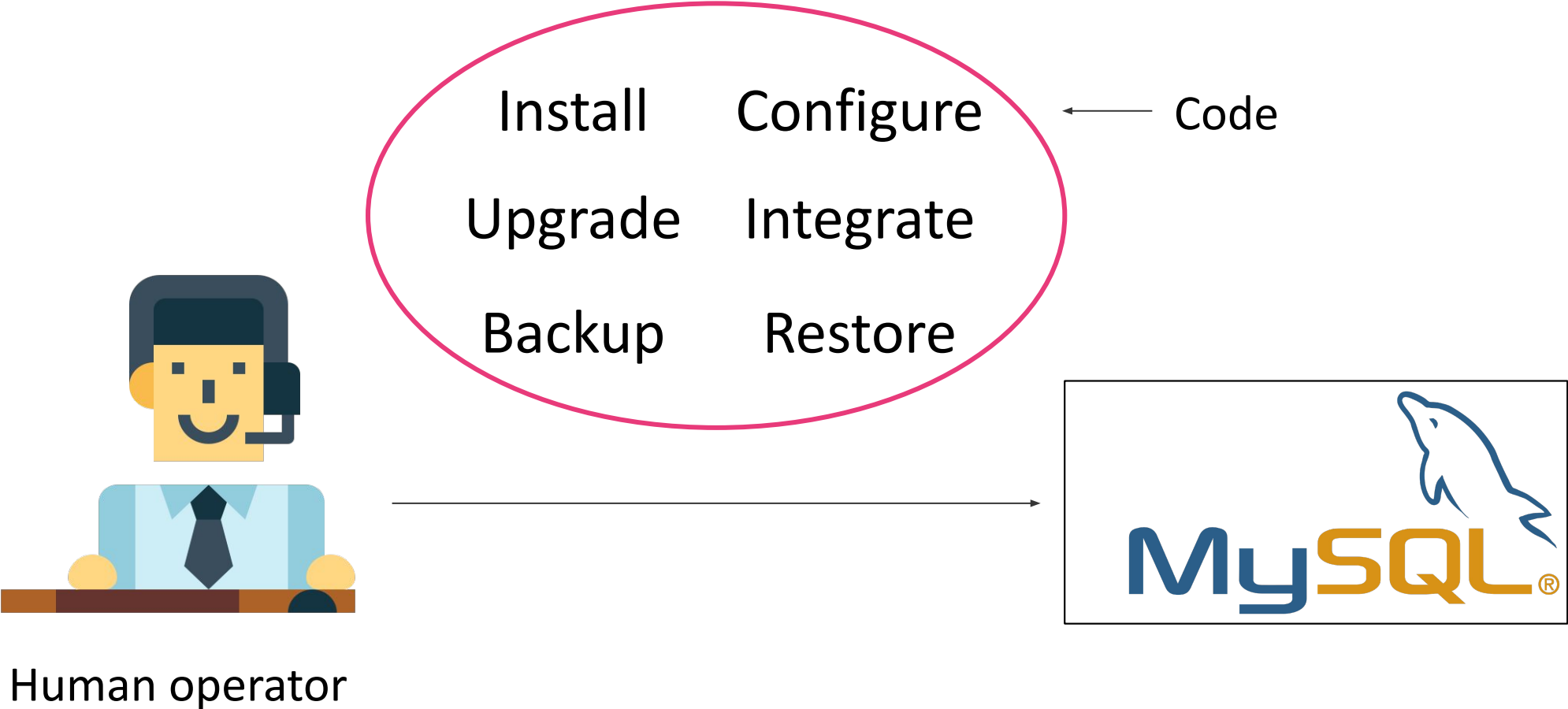
Operations:

- Day-0
 - Actions at instantiation time → cloud-init
 - Day-1
 - Operations just after instantiating
 - Day-2
 - Operations done after instantiating
- } Charm operators

Operator Pattern



Operator Pattern



Operator Pattern

Charm



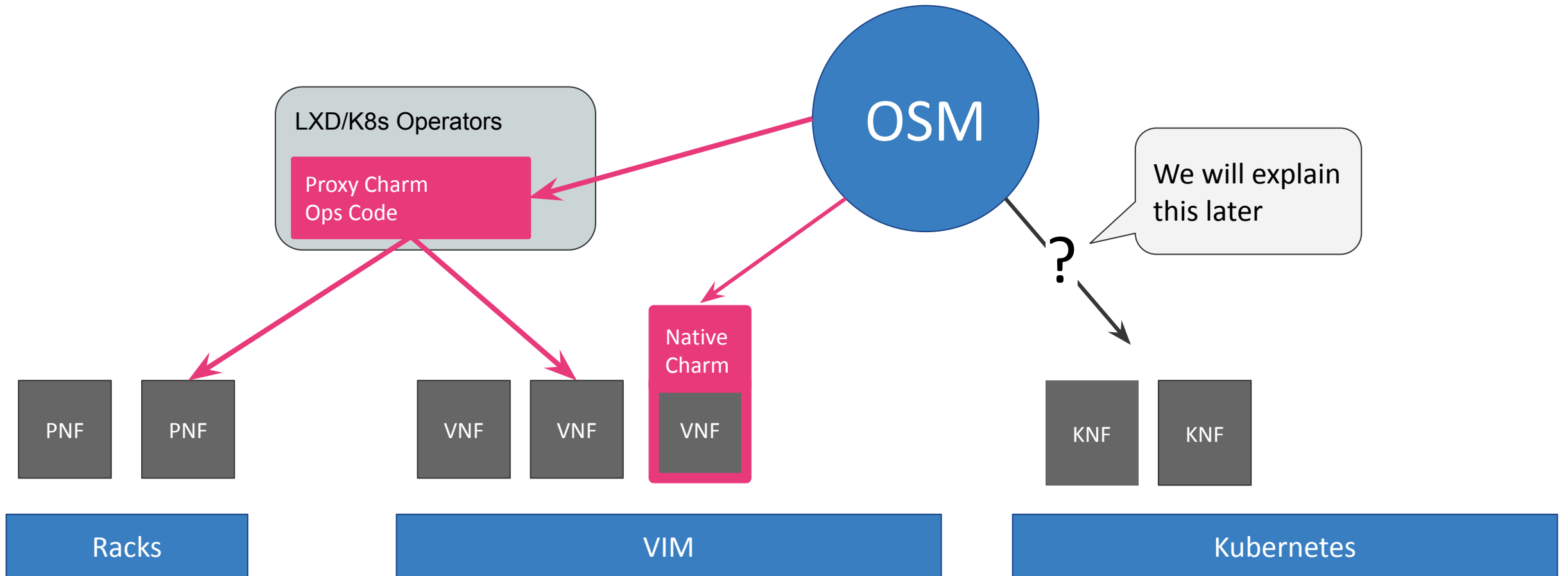
Install Configure

Upgrade Integrate

Backup Restore



Day-2 operations in OSM



Charm anatomy

<https://juju.is/docs/sdk/charm-anatomy>

```
|— actions.yaml
|— charmcraft.yaml
|— config.yaml
|— metadata.yaml
|— README.md
└─ src
    └─ charm.py
```


[metadata.yaml](#)

- Basic metadata information about the charm
- Endpoints. Used for relations.
 - This is an advanced topic, and it won't be covered in this presentation

```
name: kamilio
display-name: Kamailio SIP Server
description: Kamailio description...
summary: Kamailio charm summary...
```

[config.yaml](#)

- Configuration options

```
options:  
  sip-domain:  
    default: "localhost"  
    description: Your SIP domain
```

[requirements.txt](#)

- Any python requirements for the charm to run

```
ops >= 1.2.0
```

[charmcraft.yaml](#)

- Charmcraft configuration file
- Used when building the charm

```
type: "charm"  
bases:  
  - build-on:  
    - name: "ubuntu"  
      channel: "20.04"  
  run-on:  
    - name: "ubuntu"  
      channel: "20.04"
```

src/charm.py

1. Operator Framework constructs
2. Core lifecycle events
3. StoredState

```
from ops.charm import CharmBase
from ops.framework import StoredState
```

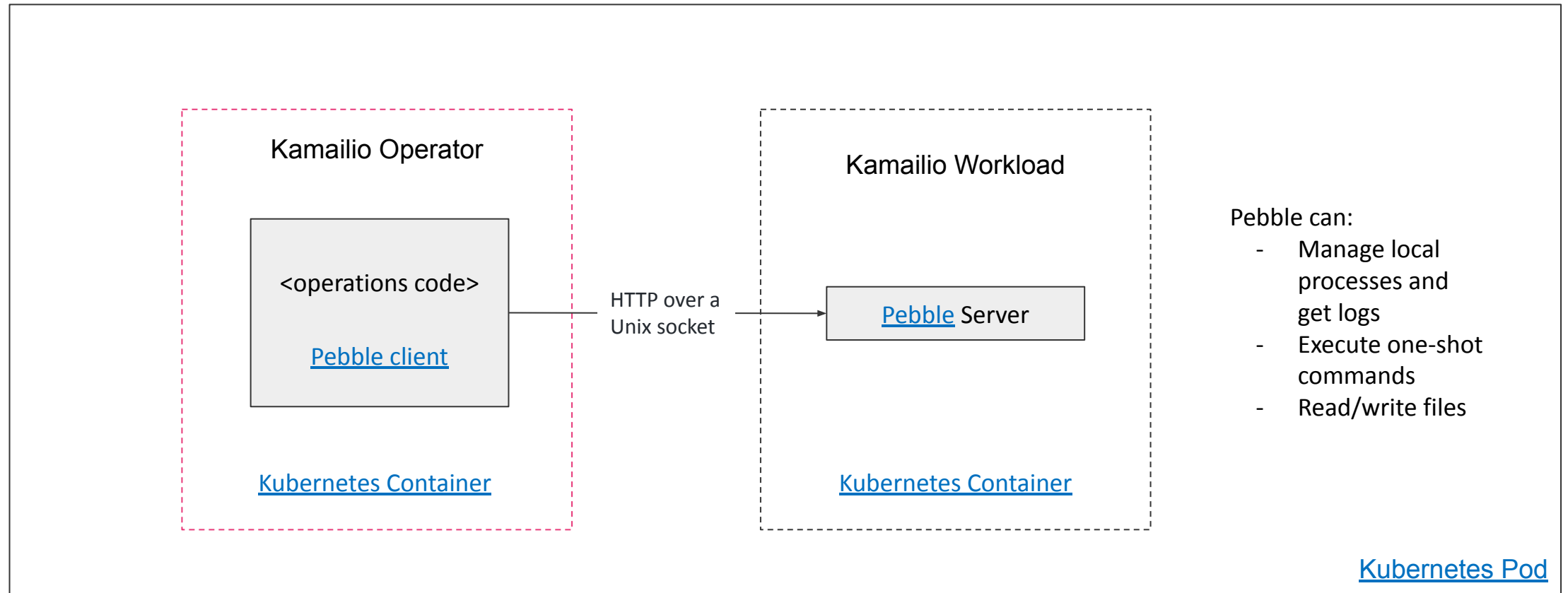
```
class KamailioCharm(CharmBase):
    """Kamailio Charm Operator."""

    _stored = StoredState() # See (3.)

    def __init__(self, *args) -> None:
        super().__init__(*args)
        self.framework.observe(
            self.on.config_changed,
            self._on_config_changed,
        ) # See (2.)
        self._stored.set_default(sip_domain=None)

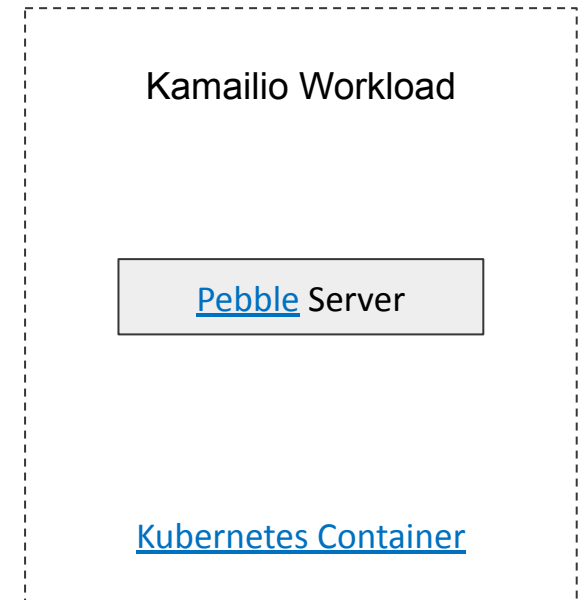
    def _on_config_changed(self, event):
        self._stored.sip_domain = self.config["sip-domain"]
```

Kamailio example:



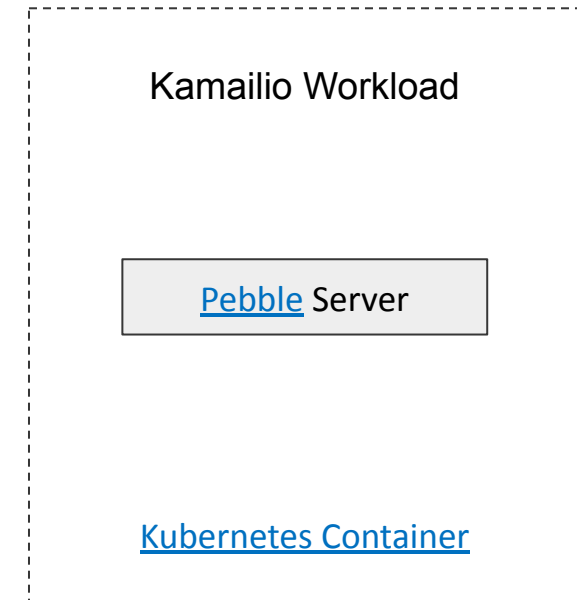
metadata.yaml

```
containers:  
  kamilio:  
    resource: kamilio-image  
  
resources:  
  kamilio-image:  
    type: oci-image  
    description: OCI image for kamilio  
    upstream-source: kamilio/kamilio:5.3.3-stretch
```



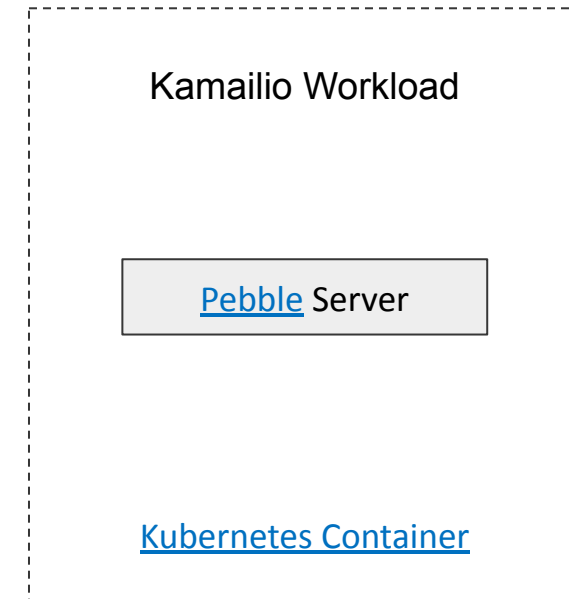
src/charm.py: Observe the pebble-ready event

```
def __init__(self, *args) -> None:
    super().__init__(*args)
    self.framework.observe(
        self.on.kamailio_pebble_ready,
        self._on_kamailio_pebble_ready,
    )
def _on_kamailio_pebble_ready(self, event):
    # ...
```



src/charm.py: Create a service to start Kamailio

```
# ...
def _on_kamailio_pebble_ready(self, event):
    container = self.unit.get_container("kamailio")
    container.add_layer(
        "kamailio",
        {
            "summary": "kamailio layer",
            "description": "pebble config layer for kamailio",
            "services": {
                "kamailio": {
                    "override": "replace",
                    "summary": "kamailio",
                    "command": "kamailio -DD -E",
                    "startup": "enabled",
                }
            },
        },
        combine=True,
    )
    container.replan()
```



[actions.yaml](#)

- Actions definition
- Name of the action
- Parameters that the action accepts

```
restart:  
  description: Restart Kamailio service
```

Handling the action: [src/charm.py](#)

```
class KamailioCharm(CharmBase):  
  
    def __init__(self, *args):  
        super().__init__(*args)  
        self.framework.observe(  
            self.on.restart_action,  
            self._on_restart_action  
        )  
  
    def _on_restart_action(self, event: ActionEvent):  
        """Handler for the restart-action event."""  
  
        try:  
            self._restart_kamailio()  
            event.set_results({"service restarted"})  
        except Exception:  
            event.fail(f"Failed restarting kamailio")
```

Charm relations and libraries

It won't be covered in this presentation.

Reference links:

- [Relations](#)
- [Libraries](#)

\$ charmcraft pack

<https://juju.is/docs/sdk>

What's next?

“Day2 operations with Kamailio - tutorial”

- How to create an action
- How to expose the action in OSM