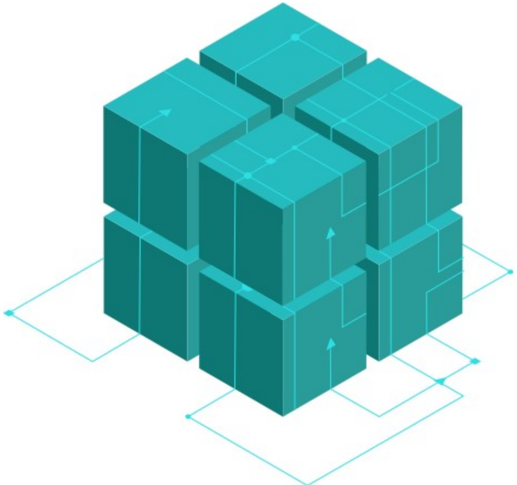
UYUNI

How to transform a server application to a “macroservice”

How we did it in Uyuni



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About me

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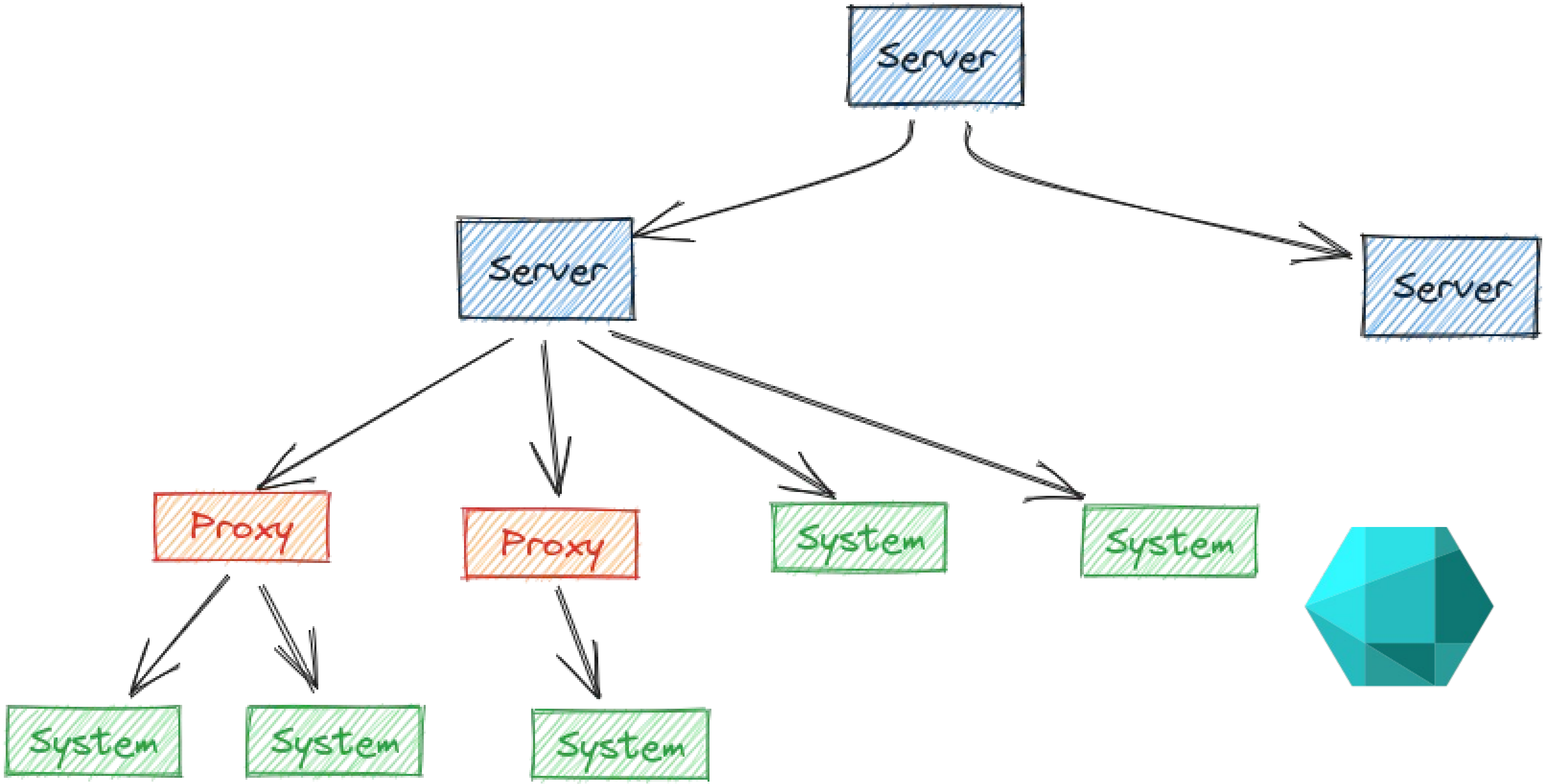
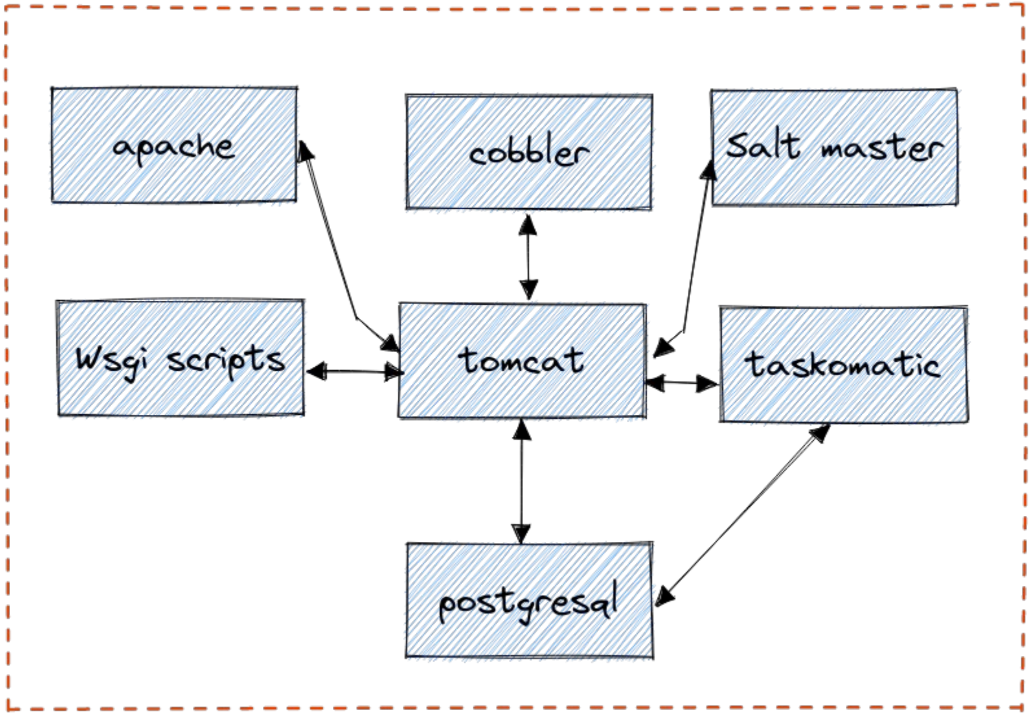
Architecture



UYUNI

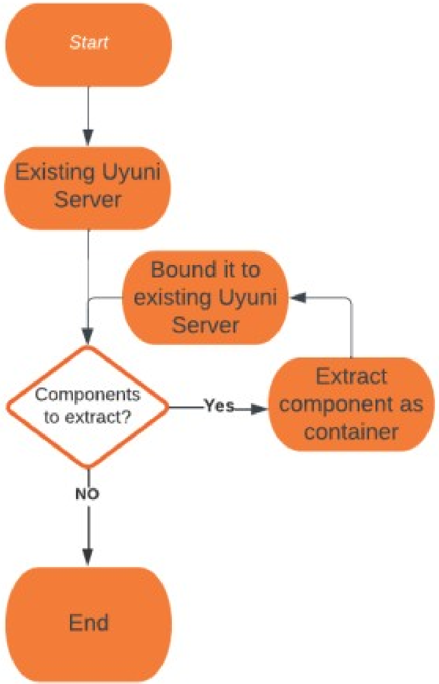
10000 ft view



Possible approach for containerize a Server Application

How containerized Uyuni Server

- Option 1



Start

Existing Uyuni Server

Bound it to existing Uyuni Server

Components to extract?

Yes

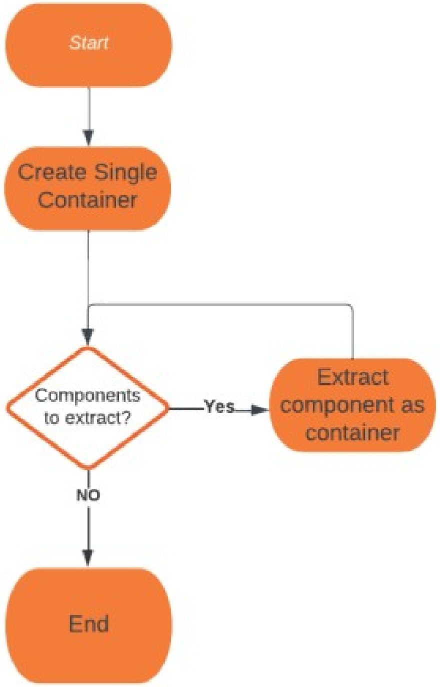
Extract component as container

NO

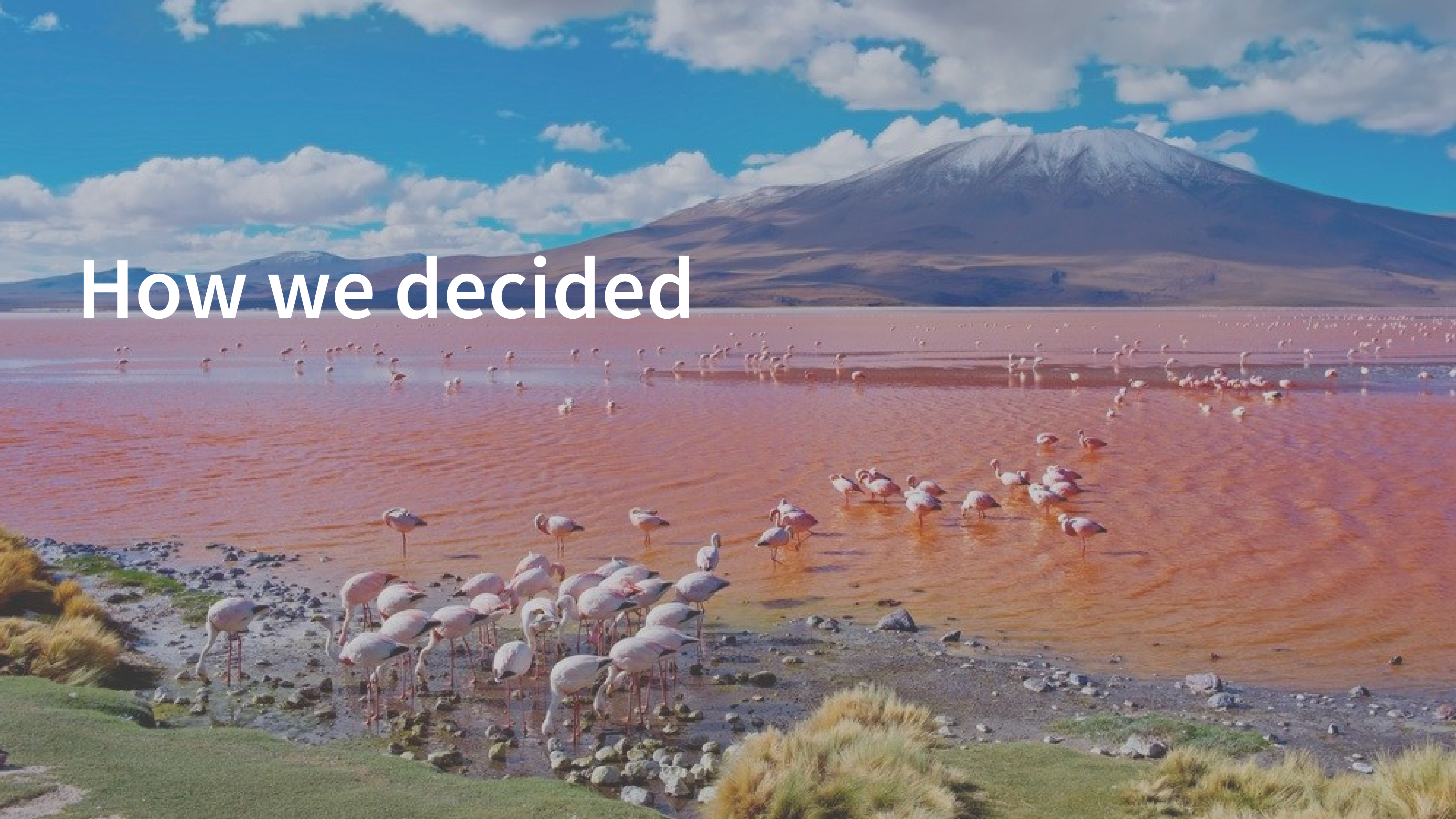
End

How containerized Uyuni Server

- Option 2



How we decided



Which are our goals in containerization?

- Indipendence from the host operating system
- Easier dependency management
- More modular
- Easy for non-container ready users
- Easier to maintain and secure
- Faster innovation
- Modernize the offering
- Align with Devops Strategies

What are our weaknesses?

- Container unfriendly code
- Calls to external tools
- Hostname / FQDN Dependency
- Timezone

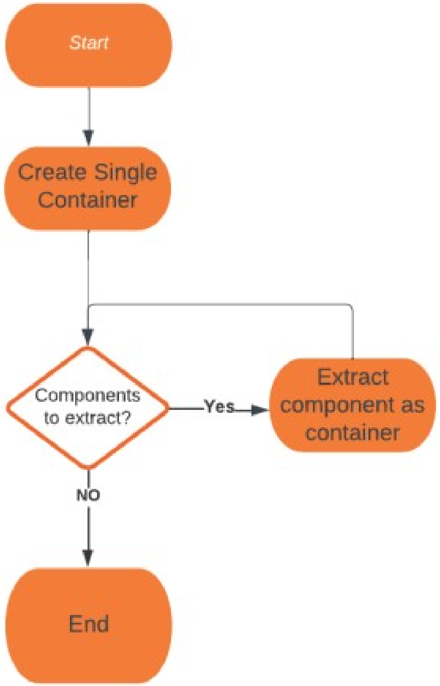
Tools like Windup https://windup.github.io helped for this analysys

Cutting Piecing

- Is it easy?
  - Container already ready?
  - Only configuration?
  - Requires code changes? How much?
- Does it bring value?
  - Can I scale it?
  - Better modularization?
  - Would it be easier to maintain?

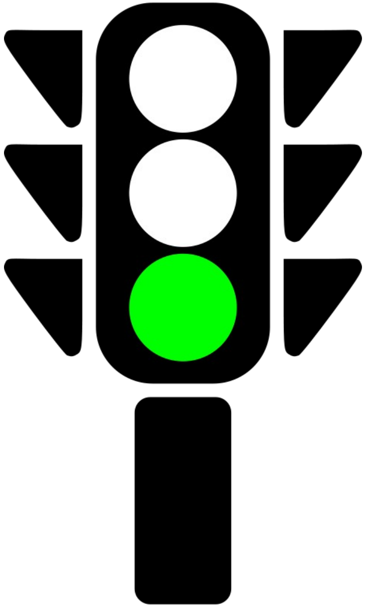
And the winner is

Option 2


Start
Create Single Container
Components to extract?
Yes
Extract component as container
NO
End

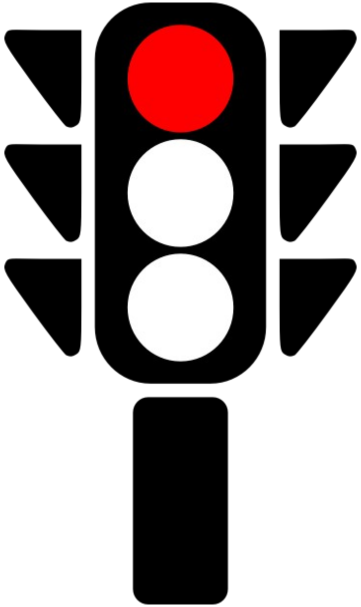
Which goals can be achieved with a single container?

- Indipendence from the host operating system
- Easier dependency management



Which goals can’t be achieved with a single container?

- More modular
  - Not without refactoring
  - To be started with selected containers
- Scalability (but this wasn’t one of our goal)



How we are proceeding

Single Container

- Prerequisite: TEST
- Create a Podman container with systemd
  - Start from an opeSUSE Leap Version (bci-init)
  - Install Uyuni as in a normal system
  - Run Unit Test, Acceptance Test, Manual tests, Reboot and test
- Perform the same tests in K8s
  - RKE2
  - K3s

In this way, we would avoid from the beginning choice that make hard to port Uyuni in K8s.

Challenge: Volumes

- Configuration files should be store in volumes
  - In this way they are persisted, otherwise they would be lost during upgrade
- Files owned by the image should not be store in volumes
  - Otherwise they would not be upgraded

Challenge: FQDN

- In K8s, FQDN cannot be defined
  - Configuration file
  - Tools (e.g. Postfix)

Challenge: Timezone

- Which timezone should be used in a container?
  - Provides methods for settings timezone

Challenge: SSL

- SSL
  - Certificates generated by cert-manager
  - Terminated at Ingress
- Ingress routes
- No fixed hostname

What about “Easy for non-container ready users” ?

How to install a Uyuni Server Container

Uyuniadm is a tool for helping user administer Uyuni servers on K8s and Podman. It provides command for:

- Install a new server from scratch
- Uninstall a server
- Migrate a remote server to container

Uyuniadm is available for

- AlmaLinux 8
- Debian 12
- EL 9
- Fedora 38
- SLE 12 / SLE 15
- Ubuntu 20.04 / Ubuntu 22.04
- openSUSE Leap 15.5
- openSUSE Micro 5.5
- openSUSE Tumbleweed

- https://github.com/uyuni-project/uyuni-tools
- https://build.opensuse.org/package/show/systemsmanagement:Uyuni:Master:ContainerUtils/uyuni-tools

Uyuniadm install

```
Install a new server from scratch

Usage:
  uyuniadm install [command]

Available Commands:
  kubernetes  install a new server on a kubernetes cluster from scratch
  podman      install a new server on podman from scratch
```

Example

```
uyuniadm install podman [fqdn] [flags]
uyuniadm install kubernetes [fqdn] [flags]
```

Uyuniadm migrate podman

This migration command assumes a few things:

- the SSH configuration for the source server is complete, including user andall needed options to connect to the machine,
- an SSH agent is started and the key to use to connect to the server is added to it,
- podman is installed locally

NOTE: for now installing on a remote podman is not supported yet!

```
uyuniadm migrate podman [source server FQDN] [flags]
```

Uyuniadm migrate kubernetes

This migration command assumes a few things:

- the SSH configuration for the source server is complete, including user and all needed options to connect to the machine,
- an SSH agent is started and the key to use to connect to the server is added to it,
- kubectl is installed locally
- A working kubeconfig should be set to connect to the cluster to deploy to

When migrating a server with a automatically generate SSL Root CA certificate, the private key password will be required to convert it to RSA in order to be converted into a kubernetes secret. This is not needed if the source server does not have a generated SSL CA certificate.

```
uyuniadm migrate kubernetes [source server FQDN] [flags]
```

Uyuniadm uninstall

Uninstall a server and optionally the corresponding volumes.

Note that removing the volumes could also be handled automatically depending on the StorageClass used when installed on a kubernetes cluster.

For instance on a default K3s install, the local-path-provider storage volumes will be automatically removed when deleting the deployment even if --purge-volumes argument is not used.

```
Usage:
  uyuniadm uninstall [flags]

Flags:
  -n, --dry-run         Only show what would be done
  -h, --help            help for uninstall
      --purge-volumes   Also remove the volume
```

Using Uyuni in containers: uyunictl

- Commands e.g.:

  ```
  uyunictl exec tail /var/log/rhn/rhn_web_ui.log
  ```

- shell in the pod run :

  ```
  uyunictl exec -ti bash
  ```

- To copy files to the server:

  ```
  uyunictl cp <local_path> server:<remote_path>
  ```

- to copy files from the server :

  ```
  uyunictl cp server:<remote_path> <local_path>
  ```

Uyunictl is available for

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- Fedora 38
- SLE 12 / SLE 15
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- openSUSE Leap 15.5
- openSUSE Micro 5.5
- openSUSE Tumbleweed

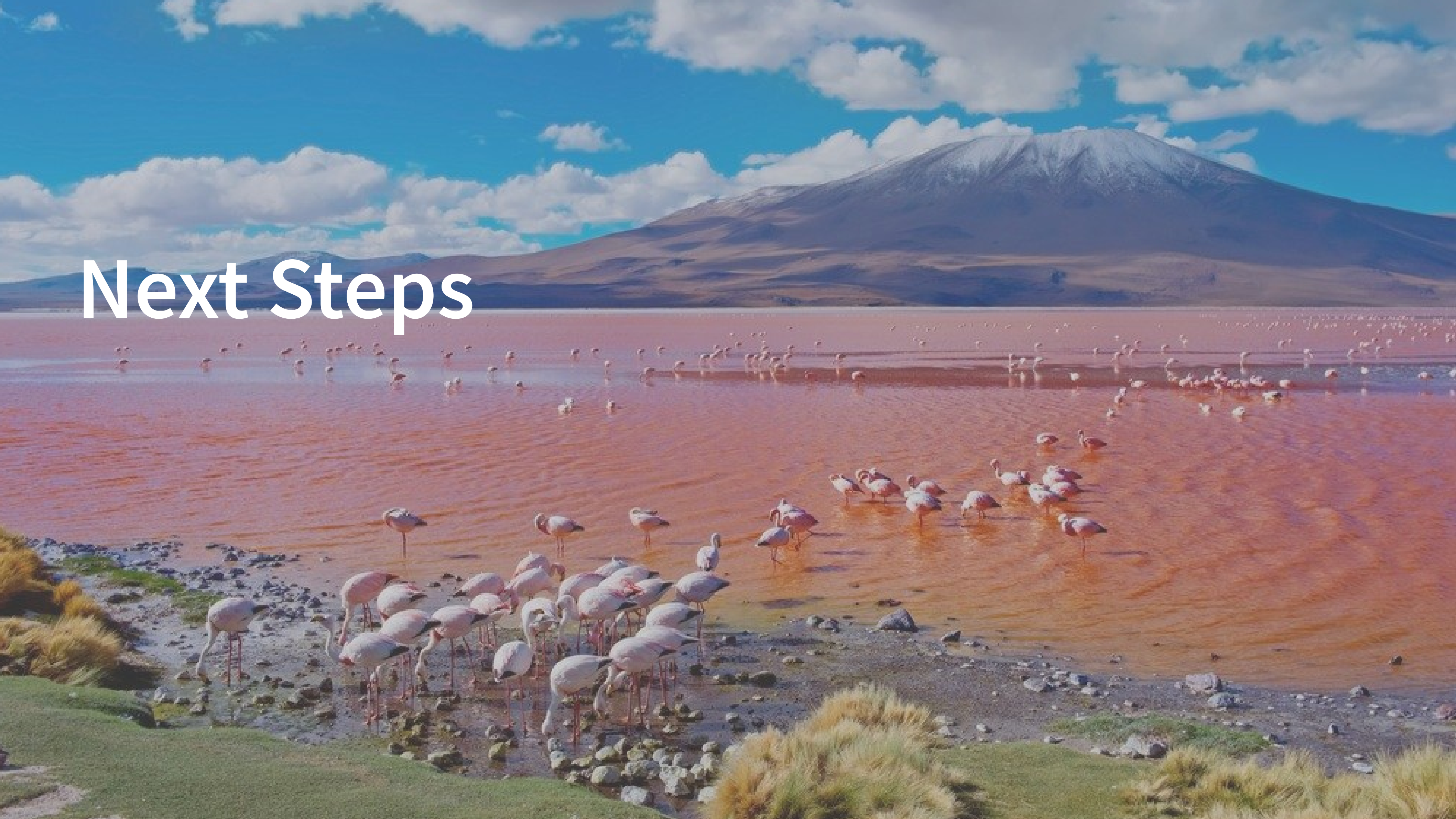
- https://github.com/uyuni-project/uyuni-tools
- https://build.opensuse.org/package/show/systemsmanagement:Uyuni:Master:ContainerUtils/uyuni-tools

Deploying code

To deploy java code on the pod change to the java directory and run:

```
ant -f manager-build.xml refresh-branding-jar deploy-restart-container
```

Next Steps



Next Steps

- Provide tool for migrating AND upgrading a Uyuni Server
- Starting to separate containers

Q&A

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