

Crossplane Provider for Taikun Workshop

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1 Introduction

The purpose of this workshop is to introduce you to [Crossplane](#) and the [Crossplane Provider for Taikun](#). The latter will allow you to use Crossplane to manage resources in Taikun.

2 How to read this document

- Text in this format is to be typed, as is, on the command line.

```
cd workshop/  
ls  
echo Hello!
```

- This format of text shows the screen output, usually the output of commands.

```
task_00/  
task_01/  
...  
Hello!
```

- This format is for code in Crossplane's configuration files,

```
1 apiVersion: organization.taikun.upbound.io/v1alpha1  
2 kind: Organization  
3 metadata:  
4   name: orga-raph-crossplane  
5 spec:  
6   forProvider:  
7     name: "new-orga"  
8     fullName: "Create taikun organization with crossplane"  
9     discountRate: 42  
10    city: "Praha"  
11    billingEmail: "billing2@foo.org"  
12    email: "contact@foo.org"  
13    phone: "065100035103"  
14    providerConfigRef:  
15      name: default
```

3 Setup

To complete this workshop, you will need to install the [Taikun Crossplane provider](#) and the workshop. You need also a working kubernetes cluster.

3.1 Requirements

- You will need Helm installed in your cluster.
- You will need Git to clone the provider's repo.
- You will need Taikun and Openstack credentials.
- You will need a working k8s cluster.

3.2 Creating a cluster

To create a kubernetes cluster you can follow the steps of the following link. <https://docs.taikun.cloud/guidelines/creating-a-cluster/>

3.3 Downloading the provider repository

```
git clone https://github.com/itera-io/upjet-provider-taikun.git
```

3.4 Downloading the workshop files

```
git clone https://github.com/itera-io/provider-jet-taikun-workshop.git
```

4 Documentation

The provider documentation is available [here](#).

5 Tasks

The end goal of this workshop is to have an operational Taikun project built solely with Crossplane configuration files. By following a step by step process, you will discover how various Taikun resources are declared and managed using Crossplane.

All your work will be done in the `workshop/` directory. These are its initial contents.

```
./workshop/  
|-- providerconfig.yaml  
|-- taikun_secret.yaml.tpl  
|-- organization.yaml  
|-- kubeprofile.yaml  
|-- slack_alerting.yaml  
|-- cloudcred.yaml  
|-- user_ap.yaml  
|-- project.yaml
```

`providerconfig.yaml` contains the Provider configuration, namely its source address and what credentials to use. You will not need to edit this file.

```
apiVersion: taikun.upbound.io/v1alpha1  
kind: ProviderConfig  
metadata:  
  name: providerconfig-workshop  
spec:  
  credentials:  
    source: Secret  
    secretRef:  
      name: my-creds  
      namespace: crossplane-system  
      key: credentials
```

During this workshop, each task should be coded in a separate config file. At the end of the workshop, your directory will be organized as such:

```
./workshop/  
|-- providerconfig.yaml  
|-- taikun_secret.yaml.tpl  
|-- taikun_secret.yaml  
|-- openstack_secret.yaml  
|-- organization.yaml  
|-- kubeprofile.yaml  
|-- slack_alerting.yaml  
|-- cloudcred.yaml  
|-- user_ap.yaml  
|-- project.yaml
```

5.1 Provider and cluster setup

5.1.1 Prepare the cluster to use the provider

First thing to do is to install crossplane in your cluster. To do so, you have to connect to the master server of your cluster. Use the ssh command:

```
ssh -i <path_of_your_id_rsa_private_key> <user>@<ip_of_your_cluster> -A
```

Note

Make sure you use the IP of the bastion server. If you generated your cluster project through the Taikun interface, the access IP of the bastion is the external IP displayed in the project details. Typical example:

```
ssh -i ~/.ssh/id_rsa alexis@185.XX.XX.XXX -A
```

Once you are connected, make sure you put yourself in a root environment using:

```
sudo su
```

The previous ssh command only got you into the bastion. You now have to ssh into the master. Make sure you have your private and public keys (id_rsa and id_rsa.pub files) in the .ssh folder. Also, ensure these files have the right permissions by running:

```
chmod 600 id_rsa*
```

Use the ssh command again, but replace the IP by the local IP address of the master server. For example: 192.XXX.XXX.XXX Don't forget to run "sudo su" again.

Once you are there, you can follow [this guide](#) to install crossplane with Helm. After finishing the installation, make sure you leave the master and then leave the bastion by running many times the command:

```
exit
```

Before going any forward, make sure you get the kubeconfig file of your kubernetes cluster, rename it config and have it at the path: \$HOME/.kube/config

When it is done you can install the Taikun crossplane provider with this command at the root of the provider repository:

```
kubectl apply -f examples/install.yaml
```

You can now go into the workshop repository.

```
cd path-to-workshop-repo/workshop
```

5.1.2 Authentication

In order to complete the tasks that follow, you will need to provide Taikun credentials to Crossplane. You will need a Partner account as some of the tasks, such as creating an organization, require Partner privileges.

Note

If you want to use the development environment, you must define the api_host argument under your Taikun password in the secret:

```
# taikun_secret.yaml.tpl
[...]
"password": "your_password",
"api_host": "api.taikun.dev"
```

if you set the api_host argument, be sure you have added a coma after the value of the password argument.

Then you can run the following command to create a secret which stores your Taikun credentials to which the providerconfig refers. Please change TAIKUN_EMAIL and TAIKUN_PASSWORD values with your Taikun credentials.

```
TAIKUN_EMAIL="your-email"
TAIKUN_PASSWORD="your-password"
cat taikun_secret.yaml.tpl | sed -e "s/your_email/${TAIKUN_EMAIL}/g" \
| sed -e "s/your_password/${TAIKUN_PASSWORD}/g" > taikun_secret.yaml
```

To find out more about providing sensitive data in Kubernetes, see this [page](#).

Finally, in order to connect to Taikun with the Crossplane provider you can now execute the following commands:

```
kubectl apply -f taikun_secret.yaml
kubectl apply -f providerconfig.yaml
```

Note

You will may be use the `sudo` permission to run `kubectl` commands.

You can now create Taikun resources !

5.2 Task 0: Organization

Note

For this task, please write your code in the file `organization.yaml` at the root of the `workshop/` directory.

The objective of this first task is to create an organization. All resources created in the future will be part of this organization. As this is the first task, every step of the process is documented.

Once all the steps from subsection 5.1 *Provider and cluster setup* are done, you can declare your organization resource. Create `organization.yaml` and write the following configuration block into the file.

```
apiVersion: organization.taikun.upbound.io/v1alpha1
kind: Organization
metadata:
  name: myorg
spec:
  forProvider:
    name: "<name>"
    fullName: "<full-name>"
    discountRate: 142
  providerConfigRef:
    name: providerconfig-workshop
```

Be sure to replace `<name>` and `<full-name>` with names of your choosing. Be sure you put them between double quotes. You can also choose another metadata name instead of `myorg`.

Tip

Notice the syntax of the configuration block, as you are creating a resource, it begins with the keyword `apiVersion`, followed by its CRD name and the api version. The type of resource is always lowercase and followed by the name of the provider, thus `"organization.taikun.upbound.io/v1alpha1"`. Following the resource's `apiVersion` is a metadata name, it must be unique for this type of resource, and is used to refer to this specific resource, as you will find out later. Watch out, this field is not the name of the resource in Taikun.

Three arguments are then defined in `spec` then `forProvider` fields: `name`, `fullName` and `discountRate`. On the left side of the colon is the argument's identifier, on the right is its value. See the [documentation](#) of Taikun's organization resource for a full list of arguments, i.e. the resource's *schema*.

Metadata names and argument names can contain letters, digits, underscores and hyphens and may not start with a digit. Their length must be lower than 30 characters.

Now apply your changes.

```
kubectl apply -f organization.yaml
```

Tip

If you have already created resources, `kubectl apply` will create a new resource by making a request to Taikun's API.

To check if your resource is created successfully execute the following command :

```
watch kubectl get managed
```

You should get a False state.

NAME	READY	SYNCED	EXTERNAL-NAME	AGE
organization.organization.taikun.upbound.io/myorg	False			15s

In order to show the errors describe the resource you have just created.

```
kubectl describe organizations.organization.taikun.upbound.io myorg
```

You should have in the Event field at the bottom of the output an error message like the following:

```
Warning CannotObserveExternalResource 2s (x4 over 7s) managed/organization.taikun.upbound.io/v1alpha1,kind=organization cannot run refresh: refresh failed: expected discount_rate to be in the range (0.000000 - 100.000000), got 142.000000:
```

Tip

`kubectl describe` command is used to describe (obviously) the resource you have created. You can use this command in either way:

```
kubectl describe crd-name my-ressource
kubectl describe -f path-to-my-ressource-file
```

To get the name of the crd you can use the `kubectl get crds` command or the `kubectl get crds | grep taikun` to see all taikun crds.

Now fix the discount rate so it is in the range 0-100 and run `kubectl apply` again. Normally you should have the following output for `watch kubectl get managed` command.

NAME	READY	SYNCED	EXTERNAL-NAME	AGE
organization.organization.taikun.upbound.io/myorg	True	True	14236	15s

Tip

The EXTERNAL-NAME field is the id of your resource in Taikun.

You may wish to check the organization was indeed created at app.taikun.cloud (or app.taikun.dev if you are working on the working environment).

Note

Some resources can take a certain amount of time to be created.

5.3 Task 1: Kubernetes Profile

Note

For this task, please write your code in the file `kubeprofile.yaml` at the root of the `workshop/` directory.

Now that you have created an organization, you will create a Kubernetes profile belonging to it. Check the kubernetes profile resource's schema on [the provider's documentation](#). and declare the resource in `kubernetesprofile.yaml`. Set `organizationId` to the ID of the organization created in the previous task (see subsection 5.2 *Task 0: Organization*).

Tip

To find the ID of the organization, run

```
watch kubectl get managed
```

Then you should get the `EXTERNAL-NAME` of the `myorg` organization.

NAME	READY	SYNCED	EXTERNAL-NAME	AGE
organization.organization.taikun.upbound.io/myorg	True	True	14236	15s

So here the organization ID will be 14236.

Feel free to set some of kubernetes profile's other optional attributes, such as `scheduleOnMaster` and `loadBalancingSolution`.

Once you have declared your resource, apply and move on to the next task.

5.4 Task 2: Slack Configuration & Alerting Profile

Note

For this task, please write your code in the file `slack_alerting.yaml` at the root of the workshop/ directory.

You will now create an alerting profile using a Slack configuration.

1. Start by declaring a Slack configuration. You can find its documentation [here](#).

Its hook URL should be `https://hooks.myapp.example/ci`. It must send **alert-type notifications only** to the channel `foo`.

2. You can now declare the alerting profile. [Here](#) is its documentation.
The alerting profile should send notifications **daily** using the Slack configuration declared above.

Important

As always, your resources should belong to the organization created in subsection 5.2 *Task 0: Organization*.

But this time we will use the Reference arguments. Indeed as it is said in the [documentation](#) of the alerting profile resource you have a `organizationIdRef` argument, which allows us to refer to an organization by its metadata name.

For instance, the previous metadata name of the organization you have created is `myorg` (or the name you have chosen). So the `organizationIdRef` argument value will be `myorg` (or the name you have chosen).

```
organizationIdRef:
  name: "myorg"
```

Now you can do the same for the argument which refers to the alerting profile resource.

Tip

You can write configurations for multiples resource in the same file, you just have to separate the resources' configurations with 3 `"--"`.

```
apiVersion: organization.taikun.upbound.io/v1alpha1
kind: Organization
metadata:
  name: myorg1
spec:
  [...]
---
apiVersion: organization.taikun.upbound.io/v1alpha1
kind: Organization
metadata:
  name: myorg2
spec:
  [...]
```

Once you have declared these two new resources, apply and move on to the next task.

5.5 Task 3: Cloud Credentials

Note

For this task, please write your code in the file `cloudcred.yaml` at the root of the `workshop/` directory.

Important

You will need OpenStack credentials to complete this task.

Cloud credentials are needed to create a Taikun project. In a real work environment, cloud credentials should not be stored under version control; it's why we'll use kubernetes secret.

Define the OpenStack cloud credential resource in `cloudcred.yaml`. [Here](#) is its documentation. You will need a secret to provide sensitive data like your Openstack password. For this, create a new file named `openstack_secret.yaml` to create a secret configuration for Openstack cloud credentials.

Here is the template of a secret:

```
apiVersion: v1
kind: Secret
metadata:
  name: <secret-name>
  namespace: <namespace>
type: Opaque
data:
  password: <openstack-password-base64>
```

- The `<secret-name>` argument is the name you will refer to during the creation of your Openstack cloud credential configuration file.
- The `<namespace>` argument is the namespace where your secret will be stored.
- The `<openstack-password>` argument is your Openstack password in base 64.

Tip

To encode your password to base64 you can execute this command

```
echo -n "your-password" | base64
```

or you can use a base64 translator like [this one](#).

Once you have declared your new resource, apply and move on to the next task.

Important

As always, your resources should belong to the organization created in subsection 5.2 *Task 0: Organization*.

5.6 Task 4: Users

Note

For this task, please write your code in the file `user_ap.yaml` at the root of the `workshop/` directory.

You will now add an user and an access profile to the Taikun organization.

You can now declare the resources in `user_ap.yaml`, the resources must belong to the organization created in subsection 5.2 *Task 0: Organization*. [Here](#) is the user resource documentation and [here](#) for the access profile resource.

Note

There are multiple kinds of roles for a Taikun user. Choose the adapted role for your user. For more information, see this [page](#).

Once you have declared the user and access profile resources, apply and move on to the next task.

5.7 Task 5: Project and User attachment

Note

For this task, please write all your code in the file `project.yaml` at the root of the `workshop/` directory.

5.7.1 Project

Finally, you can declare a project resource. In order to create the resource you will need to import some flavors and images to create a kubernetes cluster or a vm. In our case we will create a kubernetes cluster so we just need flavors.

Tip

Please read this [page](#). It explains how to create a cluster with Taikun and which resources are required.

Now it is your turn to create the project with the resources we created in the previous tasks. You can use reference arguments because all the resources needed have been created within your cluster.

You can find [here](#) the project resource documentation.

5.7.2 Project User Attachment

Now, as you just have written the configuration file of your project, you can assign users to it. The users you want to attach to the project must be in the same organization. In our case the resources must belong to the organization created in subsection 5.2 *Task 0: Organization*.

See the Project User Attachment documentation [here](#), and after writing the two resources in `project.yaml`, you can apply your file.

6 Summary

Congratulations !! You just finished the workshop !

You can now try to create other resources to be more familiar with the Taikun Crossplane provider.

Here are some interesting links that can be useful:

- The provider documentation: <https://doc.crd.s.dev/github.com/itera-io/upjet-provider-taikun>.
- Taikun documentation: <https://itera.gitbook.io/taikun/>.

Note

To delete a resource you just have to run

```
kubectl delete -f path-to-resource.yaml
```

or

```
kubectl delete crd-name resource-name
```

Sometimes the deletion can take many seconds to many minutes according to the resource.