

canarie



Technical Guide:

DAIR Migration Preparation

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Introduction

The audience for this guide are the users of DAIR who have resources which they need to move to another cloud. Examples of these resources are images, instances, and volumes.

This document will guide the users through the specific steps necessary to prepare their resources to be migrated to another cloud. The instructions that follow should generally work on most any IaaS cloud by making your own modifications to suit your specific needs or the specific provider.

Migration Checklist

This is a non-exhaustive list of items to check before you can consider your migration to be complete.

1. Images migrated
2. Instances migrated
3. Volumes migrated
4. Volumes attached and mounted in instances
5. Security Group rules manually copied
6. Instances assigned to proper Security Group(s)
7. New Public IPs allocated and assigned
8. Application configuration has been updated on all instances

More generally, here is a list of items to consider and be aware of from the business/organization perspective (source: [A Checklist for a Move to the Cloud](#)).

- Have a process for deciding which applications or workloads are candidates for Cloud
- Think about service requirements in terms of security, privacy, compliance and performance
- Consider issues around migrating existing workloads
- Think about the economic factors - what to do about existing sunk costs
- Accurately think about the potential demand curve to assess the economic impacts of a move to the Cloud
- Consider issues relating to vendor lock-in
- Make sure any prospective vendor is sufficiently flexible to meet your needs
- Think about the changing scope of needs within your IT department
- Consider the management challenges that the move might introduce - things like dealing with objections and employee retraining

Concepts

Terminology

DAIR is based on OpenStack which comes with a few domain specific terms.

Images

Images are templates that virtual machines are based off of. They are created by first creating a virtual machine with all necessary configurations. The virtual machine is then stripped of any unique identifiers and turned into an Image. This is known as "bundling" or "snapshotting".

In DAIR and OpenStack, they are stored as [qcow](#) files and have a naming scheme of "b4ce3974-c1e1-4a8c-a57f-5e53d2253906".

Instances

An instance is a running virtual machine. An instance is created by selecting the Image that the virtual machine will be based off of and then launching it.

In DAIR and OpenStack, they have the same naming scheme as images: "b4ce3974-c1e1-4a8c-a57f-5e53d2253906".

Volumes

In DAIR you will see storage attached to instances referred to as volumes.

Volumes provide persistent storage for Instances. Volumes can be attached, detached, reattached, and moved in between Instances (dependent upon filesystem compatibility).

In DAIR and OpenStack, the usual format of "b4ce3974-c1e1-4a8c-a57f-5e53d2253906" is used.

Credentials

There are two types of credentials: key pairs and certificates.

Key pairs are a public/private key pair that can be used to log in to Instances via SSH.

Certificates are a public/private x509 certificate pair that can be used for authentication when using EC2-based command-line tools.

IP Addresses

In OpenStack, a public IP Address is known as a Floating IP Address. This IP is able to be attached, detached, and re-attached to your OpenStack Instances. Once an Instance has a Floating IP Address, it can be accessed from the public internet.

Tools

OpenStack

OpenStack can utilize the euca2ools for EC2 compatible command-line access. In addition, a suite of native OpenStack tools is also available.

Installation

Ubuntu

Create the file `/etc/apt/sources.list.d/cloud.list` with the following contents:

```
deb http://ubuntu-cloud.archive.canonical.com/ubuntu precise-updates/grizzly  
main
```

Then run

```
$ sudo apt-get update
```

Once the apt repository is installed and updated, you can install the various tool packages:

nova

```
$ sudo apt-get install python-novaclient
```

glance

```
$ sudo apt-get install python-glanceclient
```

cinder

```
$ sudo apt-get install python-cinderclient
```

euca2ools

```
$ sudo apt-get install euca2ools
```

Amazon Linux, CentOS, Fedora, and RedHat

Enable the EPEL testing repo by editing `/etc/yum.repos.d/epel.repo` and `/etc/yum.repos.d/epel-testing.repo`.
Change:

`enabled=0` to `enabled=1`

under the `[epel]` and `[epel-testing]` section.

Next, install the various tool packages:

nova

```
# yum install python-novaclient
```

glance

```
# yum install python-glanceclient
```

cinder

```
# yum install python-cinderclient
```

Cloud Migration Preparation

Getting Started

Prerequisites

Confirm that you have all needed OpenStack credentials available to access your resources in DAIR.

OpenStack credentials consist of a username, project, and password. They can be downloaded from the [Access & Security page](#) under the "API Access" tab. Additionally, EC2 compatible credentials can also be downloaded from that page as well. Note that the credentials that you download are unique to a specific Region (Alberta and Quebec).

Preparation

Instances

Instances can be "snapshotted" and turned into images. By using the "glance" command line tool, you can download your image as a QCOW file. If the cloud provider that you will be moving to supports QCOW images, you can then upload the image to the new provider.

Creating a Snapshot

From the DAIR Dashboard, click on the Instances tab. You will see a list of your running instances. From the Instance Menu on the right side, click "Create Snapshot". Give your snapshot a name and click the button to begin. **Snapshotting takes anywhere between 2 to 30 minutes.**

Downloading a Snapshot

To download a snapshot, use the "glance" command line tool like so:

```
$ source openrc.sh
$ sudo glance image-list
$ sudo glance image-download <uuid> --file my-image.img
```

Uploading a Snapshot

This will vary from provider to provider

Converting a Snapshot

If the cloud provider does not support QCOW images, they might support VHD (Windows) or VMDK (VMWare) images. In some cases, it is possible to convert the QCOW image to another format. To do this, you will need access to a Linux server with the "qemu-utils" package installed. Once installed, run the following command:

```
$ sudo qemu-img convert -O vmdk my-image.img my-image.vmdk
```

Volumes

The best way to transfer volumes data from DAIR to another provider is viarsync.

Make sure your volume is attached and accessible in a running OpenStack Instance. Next, create a volume on the new cloud provider and attach it to a running instance.

Make sure you are able to log in from the DAIR instance to the new provider's instance via SSH. Finally, rsync the volume using a command similar to below:

```
$ sudo rsync -e "ssh -i /home/ubuntu/my-key.pem" --stats -avv /mnt/
data root@new-instance-ip:/mnt/data
```

Security Groups

Transferring the same Security Groups to a new environment is not possible. You will have to manually configure your new environment with the same Security Group setting you have on DAIR.

IP Addresses

Transferring the same IP address to a new environment or EC2 environment is not possible. You will have to configure your instance with a new Floating or Elastic IP and then modify DNS accordingly.

Swift I Object Storage

Cyberduck (Windows & Mac) and DragonDisk (Windows, Mac, Linux) are able to handle uploads and downloads of buckets that include subdirectories.. With both Cyberduck and DragonDisk you can open

multiple windows - one to connect to S3 and one to connect to Swift and drag the contents across. This downloads the file to your local computer and uploads it to Swift.

An alternative to this if your upload rate is slow is to leverage either an Amazon instance or an OpenStack instance (Windows if you want to use Cyberduck or DragonDisk, Linux if you'd prefer a script) on DAIR to act as your intermediary and leverage the greater bandwidth available.

Please e-mail your questions to: Dair.Admin@canarie.ca