

Transcoding Video through dynamic cloud allocation

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SHORT USE CASE DESCRIPTION

On the fly, transcoding of video content or streams is becoming an increasing requirement for the media industry. This is mainly due to the increase in the number of different devices and platforms that can be used to play the video content as well as the numerous numbers of available codecs. Cloud computing is a natural way to do on the fly transcoding of these streams as it is possible to create a temporary computer farm needed to run these transcoding jobs without having to configure them manually. Therefore, depending on the size of these video files, the content can be delivered to any type of device, seamlessly. In this use case, the Panlab facility is used to transcode a high quality HD file used to stream live HD content to powerful computers to a more portable Mpeg 4 format that can be viewed on portable devices.

A. Technical environment

Figure 1 displays the infrastructure used to run this use case scenario. The equipment used is as follows:

- A OpenNebula[1] managed cloud.
- A dedicated server running Panlab Testbed Manager.
- Network Switches interconnecting the nodes.

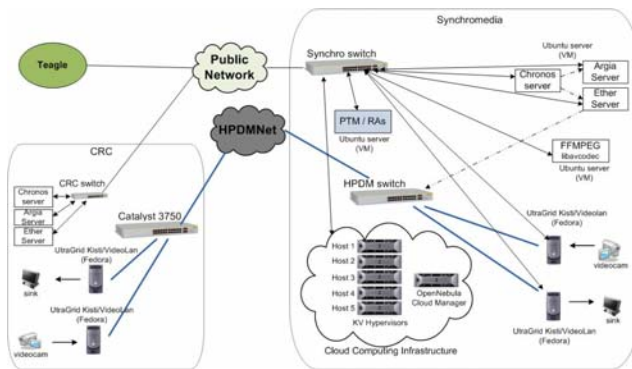


Figure 1: The Testbed Infrastructure

Only part of the infrastructure is being used by this use case, the main component being the small cloud managed by the OpenNebula[1] management software. Virtual machine images have been pre-configured with the FFMpeg[4] application that will be performing dedicated transcoding for a user. Following the Panlab Architecture, the Teagle Portal is connected to a Canadian version of the Panlab Testbed Manager that is used to host the different Resource Adapters. As shown in Figure 2 The cloud adapters features a Storage, Network and Compute resource which have different parameters that provides some level of customization on how the FFMpeg application will run. The resource adapters use the underlying OCCI[3] interface to communicate with the cloud resources.

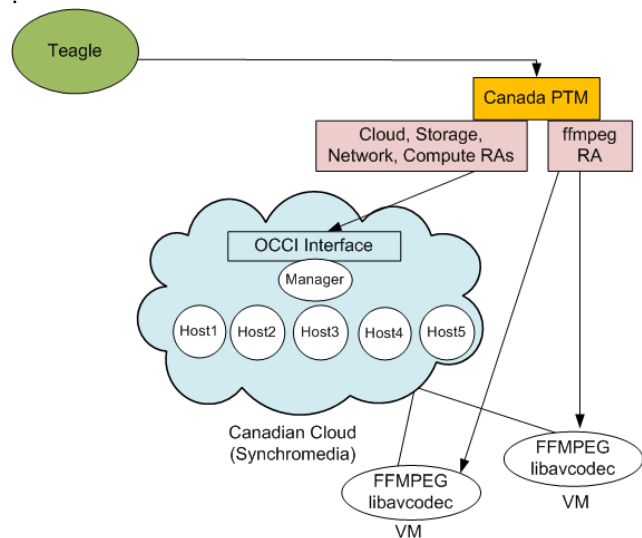


Figure 2: Logical Use Case Description

The FFMpeg application is controlled via remote SSH connections controlled by the FFMpeg resource adapter. There are some initial limitations around the current FFMpeg controller, as it may only transcode between different preconfigured formats supported by the Resource Adapter and turned in the proper command-lines.

B. Results

Running this use case, provided some initial results, the scenario only had two created servers from the cloud therefore scalability was not tested thoroughly. The initial instantiation of the VM before executing the FFMpeg application was

approximately 2 minutes, but if the VM images are resumed from a sleep it takes approximately 15 seconds to load. The

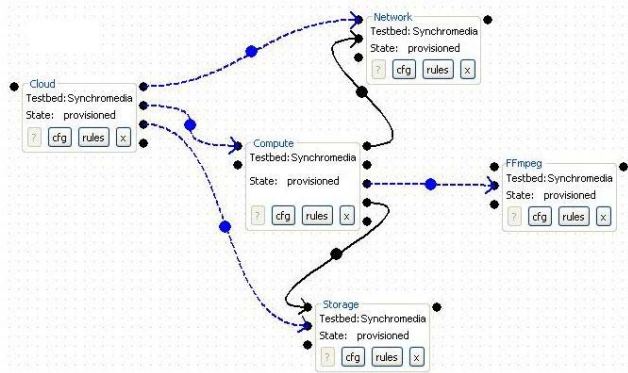


Figure 3: Resource Orchestration

transcoding took 4 minutes for a pre-uploaded 100 Mb video file.

As seen in Figure 3 the resources were orchestrated in the Teagle panlab tool and the testbed was instantiated. It was found that it is very important to have asynchronous experiments behavior as the use experience would be lessened

if the experiment was run at instantiation time. Another version of this scenario was executed on a testbed portion of the FEDERICA facilities by configuring acquired VM instances from FEDERICA.

TEST BED AVAILABILITY

The resources for creating similar scenarios are going to be available under the Panlab Office offerings. Currently, one needs to be running a OpenNebula cloud, however part of the Canadian infrastructure is being dedicated to Panlab users. These resources are funded by Québec's MEDIE and we expect to remain operational at offering these resources in a permanent setup for the upcoming year..

[1] OpenNebula, <http://www.opennebula.org>

[2] HPDMnet, <http://www.hpdnnet.net>