Video transcoding service using FFmpeg and Docker on IBM BlueMix cloud

User Manual

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Abstract

Project Description (from course website): Bluemix is an implementation of IBM’s Open Cloud Architecture based on Cloud Foundry, an open source Platform as a Service (PaaS).

Bluemix delivers enterprise-level services that can easily integrate with your cloud applications without you needing to know how to install or configure them. Bluemix provides access to a wide variety of services that can be incorporated into an application.

Docker containers wrap up a piece of software in a complete file system that contains everything it needs to run: code, runtime, system tools, and system libraries – anything you can install on a server. This guarantees that it will always run the same, regardless of the environment it is running in.

FFmpeg is a free software project that produces libraries and programs for handling multimedia data.

In this project we will develop a scalable video transcoding service on Bluemix using Docker and FFmpeg. Users can upload videos to the BlueMix’s object store, and then use the transcoding service to transcode the file to another video format. The output file will be stored back in the object store.

This document describes end user usage, and web ui in particular.
1 Brief Description

The solution consists of 3 main components each runs within a different environment:

1. Java + FFmpeg based video manipulation software: provides the necessary capability of mp4 h264 videos manipulation. Runs within Linux Ubuntu Docker container.

2. MEAN.io (www.mean.io) Web Application: provides the main UI and back-end logic for managing a complete transcoding process on the cloud. Can run on any environment supporting Node.js.

3. IBM middle-ware: is essentially a bridge between the Web Application and transcoding software.

2 Technologies

- Java - https://www.java.com
- GIT - https://www.github.com
- Maven - https://maven.apache.org
- FFmpeg - https://www.ffmpeg.org
- Docker - https://www.docker.com
- Swift OpenStack - swift.openstack.org
- MEAN.io - http://www.mean.io including:
  - NODE.js - https://nodejs.org
  - Angular.js - https://angularjs.org
  - MongoDB - https://www.mongodb.org
  - Express - http://expressjs.com
3 End User usage

1. User uploads a video via the ‘Upload Video’ button in a WEB angular UI:

   ![Upload Video Button]

   The file is uploaded first to the web-server and then to pre-defined Swift Object-Store container.

2. Once the file is uploaded, a similar ‘Transcode’ button appears:

   ![Transcode Button]

   The file is transcribed to a smaller file size.
3. This will initiate transcoding progress in Bluemix which progress is monitored and shown in the UI.

4. Upon completion, UI will mark the process as complete and a url to the transcoded file appears:

5. Pressing one of the links will open either video in the browser’s player, but it also can be saved back to users local file system