6 Conclusions

Cloud Computing technology offers the necessary subsidies to help deal with large volumes of data, especially in situations where the demand is unpredictable and elastic. Benefits include cost savings by outsourcing computer hardware and leasing CPU time [WALKER 2009][ARMBRUST 2009] and reduced deployment time, avoiding the risk of under provisioning (saturation) or overprovisioning (underutilization).

6.1 Contribution

In this thesis we explored its applicability to a class of problems we identified as open public submissions systems, i.e., public access Internet systems that accept digital, user generated content files, as the response of a call for submissions. Such systems are particularly hard to design because it is difficult to estimate a priori the volume of computational resources necessary to store and process the submissions.

In Chapter 2 we provide an in depth discussion of the problems associated to open public submission systems and those to designing cloud architectures in general. Our main contribution is to bring to light and help define the boundaries of this new class of problems.

In Chapters 3 and 4 we propose a general architecture for open public submission systems, and real world case studies that demonstrates its feasibility of the proposed approach in the video-processing domain.

In Chapter 5 we extend the previously described results by proposing the Split & Merge approach for encoding of large amounts of video data. The proposed architecture was verified to dramatically reduce both processing time and costs in this setting.

6.2 Future Work

The deployment of an application to compress videos in a Cloud, however, still poses several challenges. The main limiting factor of the approach is, at least in our geographic area, the lack of availability of bandwidth between the content generator, and the services in the Cloud. For example, using a Cloud service to

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compress high definition videos for web distribution is prohibitive in today's standards, as the videos to be processed have to be uploaded in their original formats. In this particular case, deployment in a private cluster is more efficient in terms of total production time.

All the analysis has been done leveraging Amazon's cloud platform. The same architecture could also be used in different platforms such as Microsoft's Azure, the implementation would have to adapt to each different cloud platform as they support different technology, programming languages and deployment methods.

In this work we have focused on the MPEG4 [MPEG4-10 2003] video compression algorithm and the Linux operating system. Using a different video codec as the final output, such as Microsoft's Windows Media, might require the use of Microsoft's operating system and encoder to have similar performance.

Finally, we believe our architecture could be used in the processing of data other than video. Future work includes the experimentation with different datasets, to determine the actual scope of the proposed architecture. Another issue we would like to investigate is the incorporation of autonomic computing mechanisms to help anticipate and identify faults, and the implementation of efficient prevention and recovery mechanisms. That will contribute to making the present solution more robust and scalable.

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