

GridVideo: a grid-based multimedia application

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The application is divided into two different activities:

- the Multimedia Upload activity during which service providers make multimedia objects available to their customers by uploading them to the Grid Storage Elements.
- the Multimedia Streaming activity where the media are requested by end-users through a GUI. Upon these requests the media chunks are recovered, tailored and finally streamed towards user device. This activity calls for stringent time requirements between different jobs.

Using the Grid allows for both seamless data dissemination during the Upload activity (through the use of Storage Elements and file catalogs) and performance scalability during the Streaming activity (by adapting the amount of resource used to the number of users).

3. Impact

GridVideo features different modules in order to carry out the two activities explained before.

The module for upload is quite straightforward: a simple GUI that uses the data management APIs to upload files on the SEs, and job management APIs in order to split the input file.

The modules (running either on UIs and WN) devoted to the Streaming activity are much more complex because of the time requirements. In particular in order to offer a gap-free reproduction we have to ensure that all the needed jobs start together. Moreover a messaging system is needed between the jobs and the UI application. In order to solve these problems we relied on what we call 'idle_jobs' (a sort of job agent, submitted in a proactive way to the Grid) to ensure time requirement satisfaction and we used the JMS technology in publish/subscribe mode so as to enable communications between the involved entities.

4. Conclusions / Future plans

Porting a complex, non-trivial multi job interactive application to the Grid is not an easy task. In particular it is difficult to choose the right way to segment the application into jobs without incurring into excessive penalties for the network communications. Some standardized communication mechanism between jobs is needed. Last but not least reliability is a big issue: there are many point of failure so in order to ensure reliability the application has to be carefully designed.

Provide a set of generic keywords that define your contribution (e.g. Data Management, Workflows, High Energy Physics)

Distributed multimedia streaming, Job coordination, Jms

1. Short overview

In this paper we describe GridVideo, an implementation of a multimedia application based on the Grid Computing paradigm.

In GridVideo media files are stored across the Grid into chunks; then, when a user requests for a streaming, all the chunks are tailored in order to match the client device characteristics. Grid is used in order to share computational resources (given that tailoring operations are computational intensive) and to access to distributed data.

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