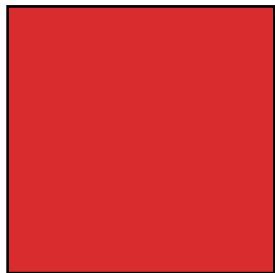
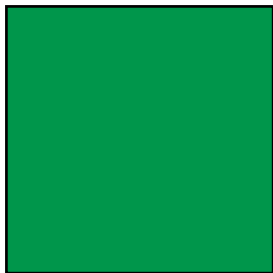


F R I K A N A L E N
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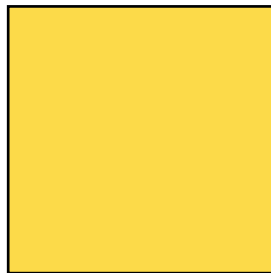
Backend



Scheduler



Transcoder



Player



Welcome to this projects PDF file.

This project is hoping to unite traditional TV-medium with the Internet. TV has always been sort of «analog» and one way communication. There is always an editor that will decide the content of the channel, and the viewers have rarely been able to participate, or contribute to the actual broadcasts. Today we have editing programs on a PC, and we can record, edit and publish right out of the box. Since all people can publish on the web, then why should they not be able to publish their content on the TV - medium?

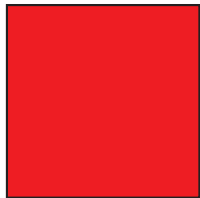
Right now there are few solutions, and those that exists are proprietary and based on expensive hardware.

Why not make an open TV channel based on open and free software?

TV should not be controlled by few. It should be possible to make a broadcast system available to all.

How about a computer with a SDI card, and an open media player controlled by the web?

<http://www.frikanalen.no/>



Backend

This is where all the media is stored, it's a computer with multiple SAN devices over fibre channel.

When a person is uploading a video it can be uploaded directly to this server.

The file server has a watchfolder for the transcoder. After transcoding, meta data will be updated in the scheduler showing that the media is available for broadcast. The transcoded file is stored in a broadcast safe format on the backend. The backend is the hub storing files for other systems. Transcoded files for web is also available on the backend.

This system is already created, as well as its central database.

All the communication will be documented in the servers API.

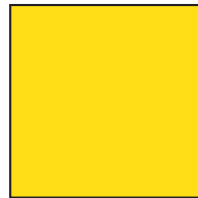


Sceduler

This is a system that generates a playlist from a web based user interface. This system has a stand alone database and is a "controller" for the open playout system. It has a web based interface for video registration, and a playlist configurator. A web based scheduler is already implemented in silverlight and can be used as a model for a new scheduler based on open standards.

"intended workflow"

Access the web site and register a video. Publish the content on the schedule (calender) for playout. On the registered video it should be possible to upload the videofile to a predefined folder on the backend. If this is done prior to the scheduled time of broadcast, the video will be aired. If the video is not uploaded in time, the user and the administrator should be warned by mail.



Transcoder

Transcoding solution needs to get "what ever format" from Backen and transcode it for broadcast and web (in open standard formats). On a communitysite you can then access the video for validating what you schedule or add comments to vidoes that has been uploaded by other users. Ideally the trascoder should be network based so you can connect new modules to accelerate transcoding.

"intended workflow"

The system gets a file in a folder, takes the file and transcodes, renames and moves it according to the schedulers database. if a new computer on the network presents itself to the transcoder as a module, it will add it to the system for accelerated transcoding.



Player

The player is the final output of the system, totally controlled by the scheduling system that tells what to play when. The player should also be able to pass trough live rtsp/http streams on scheduled time slots.

"intended workflow"

Fetch the playlist from the schedulers database, copy the files needed for the day from backend and play the videos on the SDI output according to the schedule. If the scheduled item is a live source, the feed will be played as a normal item.

Today

Frikanalen today have working implementations of all these modules, created by the company Never.no using Microsoft technology.

The backend is a Windows 2003 server with SAN storage and a tape robot attached. The upload system is based on [FileFlow](#), a third party application. The systems API is SOAP based and uses a MS SQL database to store meta-data.

The scheduler is implemented using Microsoft Silverlight. It presents the content of the video database and allows the user to schedule content two weeks in advance.

The transcoding system is split in two, one to generate DV-AVI files used for TV broadcasting, and one to generate Windows Media and Ogg Theora files for web publishing. The first uses Adobe Aftereffects, and the second uses Microsoft Expression Encoder 3. Both are quite slow single unit systems which do not handle parallel processing.

The playout system is based on a Harris video server with a CG-module attached (Character Generator).

Since Frikanalen have a fully operational backend and frontend system, why should we need to replace them? This project is not aimed at replacing the system we have, but to add modules making this democratic tool available to all. With open standards on the web-based scheduling, more efficient transcoding and cheap implementations of playout we hope to spread the concept of public access TV.

The project will be creating 3 modules that can be attached to the existing system, talking to the backend system over the SOAP API, and be based on free and open standards. It will also replace the playout unit with a standard PC / MAC with a SDI graphics card.

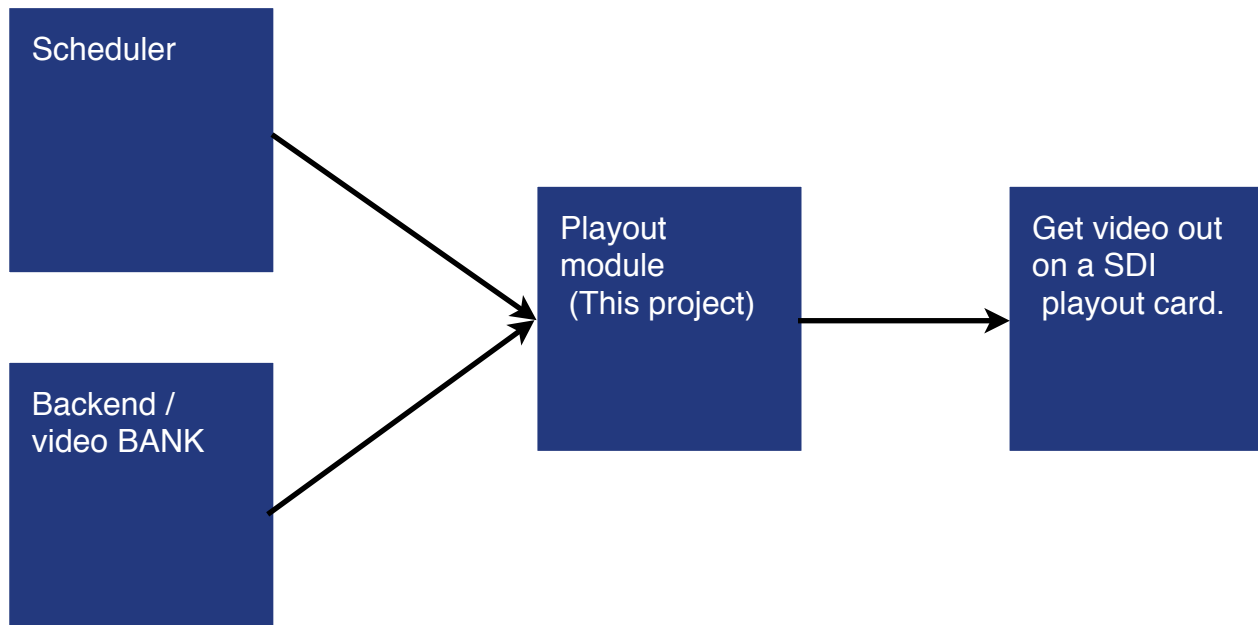
The modules need to be standalone units, not to waste time while other modules are in development. Free and open formats must be used and code must be well documented assuring all modules to work together in the final integration.

The playout module is our highest priority. The idea is to fetch information from the schedule and play out the videos at the scheduled time. When there are «holes» in the shedule between videos, «What's next» type of poster with an animated background should be shown. For larger gaps, a set of filler videos should be automatically scheduled.

Qualifications:

- basic knowledge of VLC, or a player with similar capabillites
- XML parsing knowledge
- general codec knowledge

It is an advantage to have some OpenGL / OpenCL skills to be able to get the SDI graphics card working.

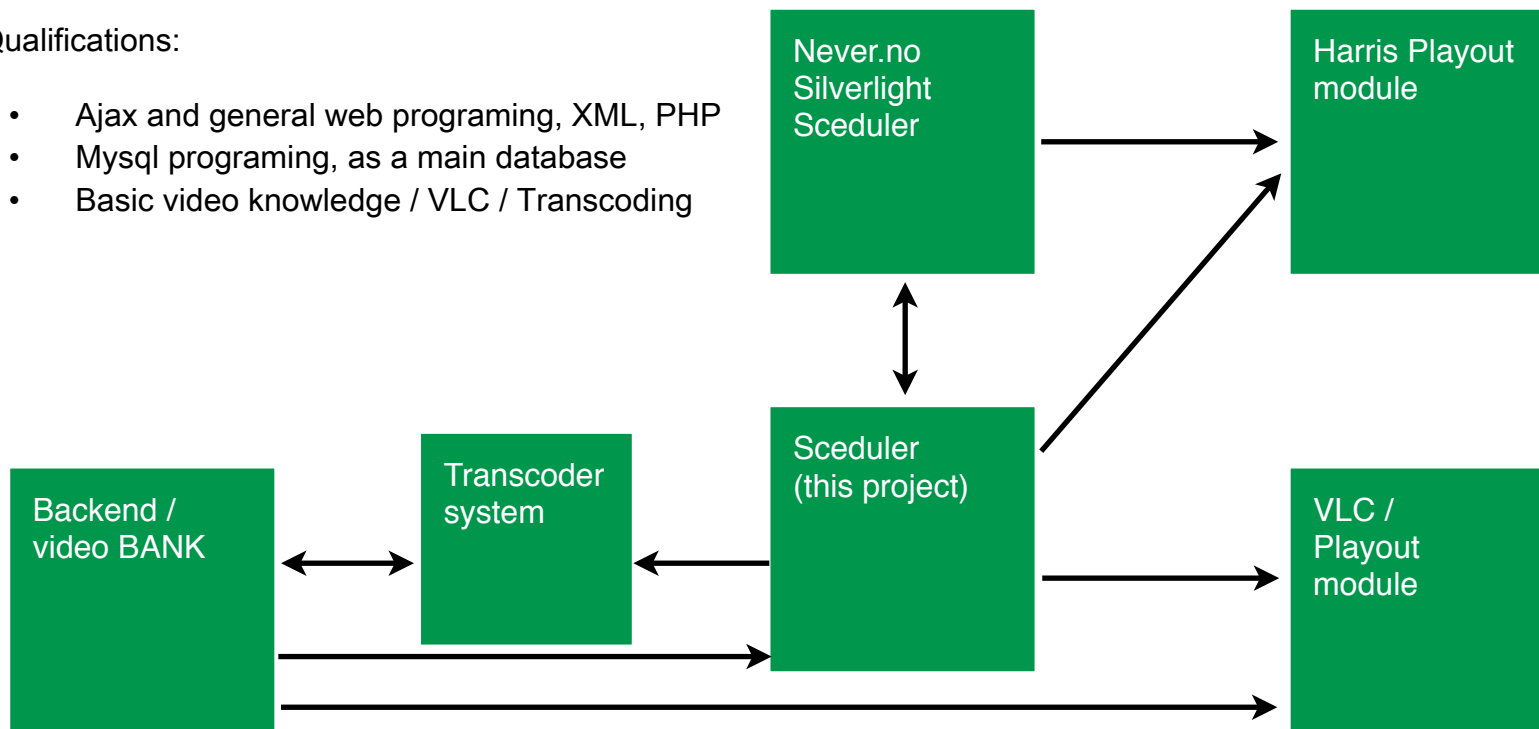


This module is the main control which connects the Player with the videos and their scheduled time of broadcast. It should be designed with the ability to communicate with all planned playout modules, even the Harris Video server (and CG) being used today.

The database should be able to register input from the Silverlight scheduler as well as this new scheduler based on open standards. In that way the playout will be functional as a spare (operational redundancy) as well as a parallel distribution with unique scheduled items.

Qualifications:

- Ajax and general web programming, XML, PHP
- Mysql programming, as a main database
- Basic video knowledge / VLC / Transcoding



The transcoder should get «Whatever file type and codec» uploaded transcoded to several pre defined output formats. DV-AVI for the playout system, Ogg Theora for the web system, and the possibility for other formats, as MP4, X264, MPEG 2...

There are a lot of open encoders out there; you have the FFMPEG project and applications like Handbrake, VLC etc.

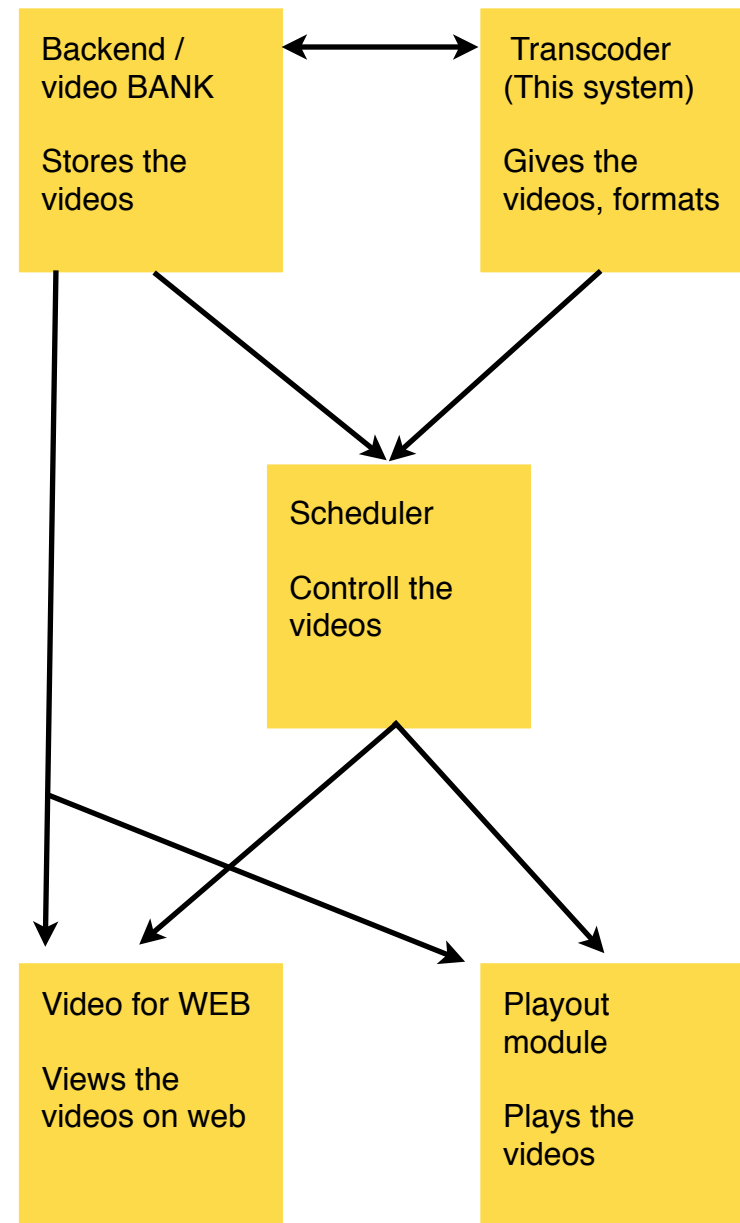
This project aims to get a working open and network based transcoder to utilize the scheduler and the backend system.

When a user has uploaded the file the database will tell the transcoder that the file is ready for transcoding. The file will then be transcoded to various formats. The scheduler will recognize a clip as online when the DV-AVI is transcoded. When the Ogg Theora file is ready it will be available on web (if the clip is published).

The transcoder should also be able to swap field orders, normalise the sound volume, check 4*3 VS 16*9 and transform pixel aspect according to output settings. Ideally it should use multiple computers as a rendering farm.

Qualifications:

- Codec knowledge
- Transcoding knowledge
- Video knowledge
- Perl, MySQL/PostgreSQL and PHP
- Network and TCP/UDP knowledge



Contact us

We are looking forward to hearing from you students, and we hope that we can offer you a "big time" project with lots of fun and world wide possibility's to work with this project, also after you're education.

if you have any questions feel free to contact us,
or check out our video grupp at <http://wiki.nuug.no/grupper/video>

sincerely

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