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# Movie Rendering Service

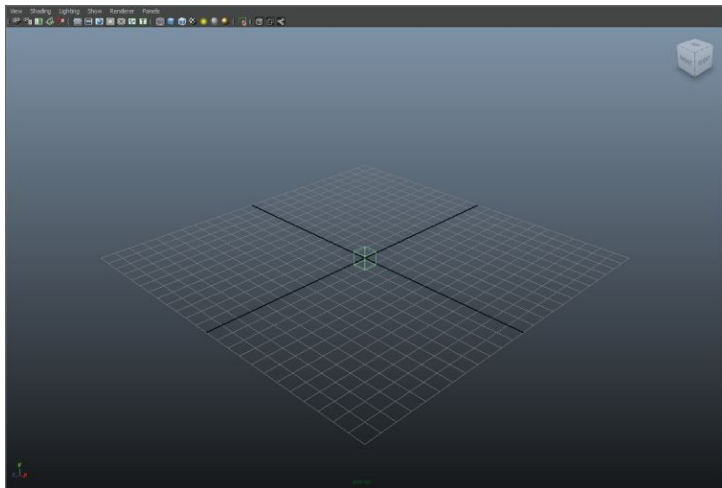
— Samantha Rack —

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# Initial Plan - Maya Animation Rendering

- Straightforward web interface for students in Visual FX
  - Renderings of final projects for the class take hours to days



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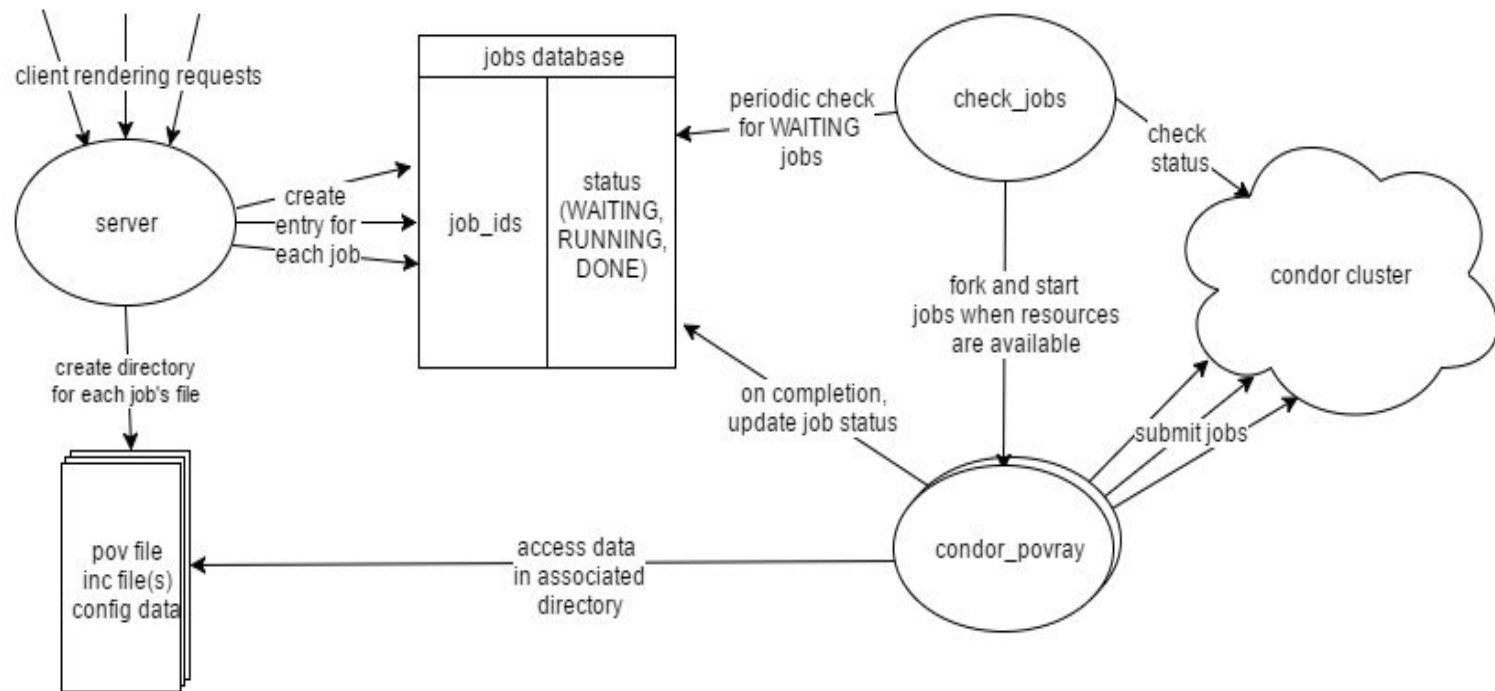
# Obstacles

- Limited number of licenses for Maya software
  - Only 30 Notre Dame machines can run the software simultaneously
- Animation dependencies prevent parallel rendering
- Optimal job length hard to achieve
  - Different frames of the same project can have drastically different render times
- Multiple versions of Maya that are not compatible
- Huge number of render options

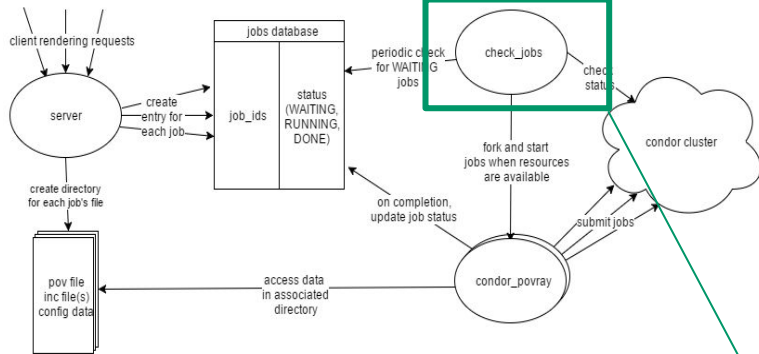
# Resulting Project - Upgraded POV-Ray Rendering

- Straightforward web interface for submission instead of terminal access
- Management of many job submissions from different clients
- Length of jobs tailored to Condor's "ideal" job running time
- Awareness of Condor cluster's status

# System Overview



# check\_jobs process



```
while (1):
```

```
// get current status of condor pool  
avail = condor_status(LINUX, avail)
```

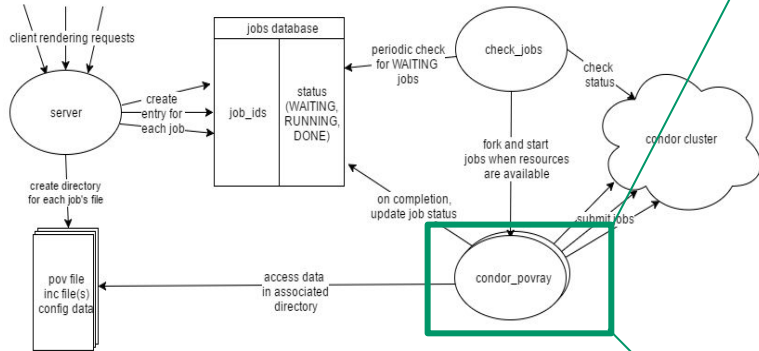
```
// check how many jobs are running  
running = db.jobs_running_count()
```

```
num_start = min(avail / factor, max_ps - running)
```

```
for i = 0 to num_start:  
    db.update(job, RUNNING)  
    fork('condor_povray', job)
```

```
// wait to check db again  
sleep(timeout)
```

# condor\_povray processes



```
// locally render one frame  
one_frame_time = time('povray file.pov -K0')
```

```
// calculate optimal number of frames per condor job  
frames_per_job = (30*60) / one_frame_time
```

```
// build submit files to render all frames  
generate_and_submit(frames_per_job, tot_frames)
```

```
// wait for completion, the build movie  
condor_wait()
```

```
db.update(job, DONE)
```

```
ffmpeg(frames)
```

# Summary

- Greater overall throughput from resources through designing Condor jobs carefully
- Gatekeeping in system accepts many jobs but is not overwhelmed

