



DREAMWORKS

Farm Manager & HTCondor Services

David Gardner



Who Are You?

David Gardner

- Sr. Software Engineer / Tech Lead
- JoSE Team (pictured in lower-right)
- Been at DWA 9 years
- Was at Jim Henson's Creature Shop for three years prior to DWA





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HTCondor @ DreamWorks

- Started in 2010
- Launched on Madagascar 3
- 15 Features and counting...
- All Dag Submissions
- Typically 1-10k jobs per submission
- Multiple Schedds per production
- Typically 5-7 active productions





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Quick Farm Stats

- 925 dedicated hosts
- +700 - 900 Desktops (night & weekends)
- 50k cores / 90k cores
- Typical Host:
 - 96 Cores & 188 GB





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- 1:24:10 Runtime
- 10 million hours
- 252 million cpu-hours
- 36 million jobs
- 1.5 million submissions
- 20 Songs





Render Farming 101

- Production / Sequence / Shot / Frame
- Shot is a unit of work
- 1,600 shots per production
- Typical shot is about 70-120 frames long (3-5s)
- 24 fps
- Jobs grouped into "Nodes"

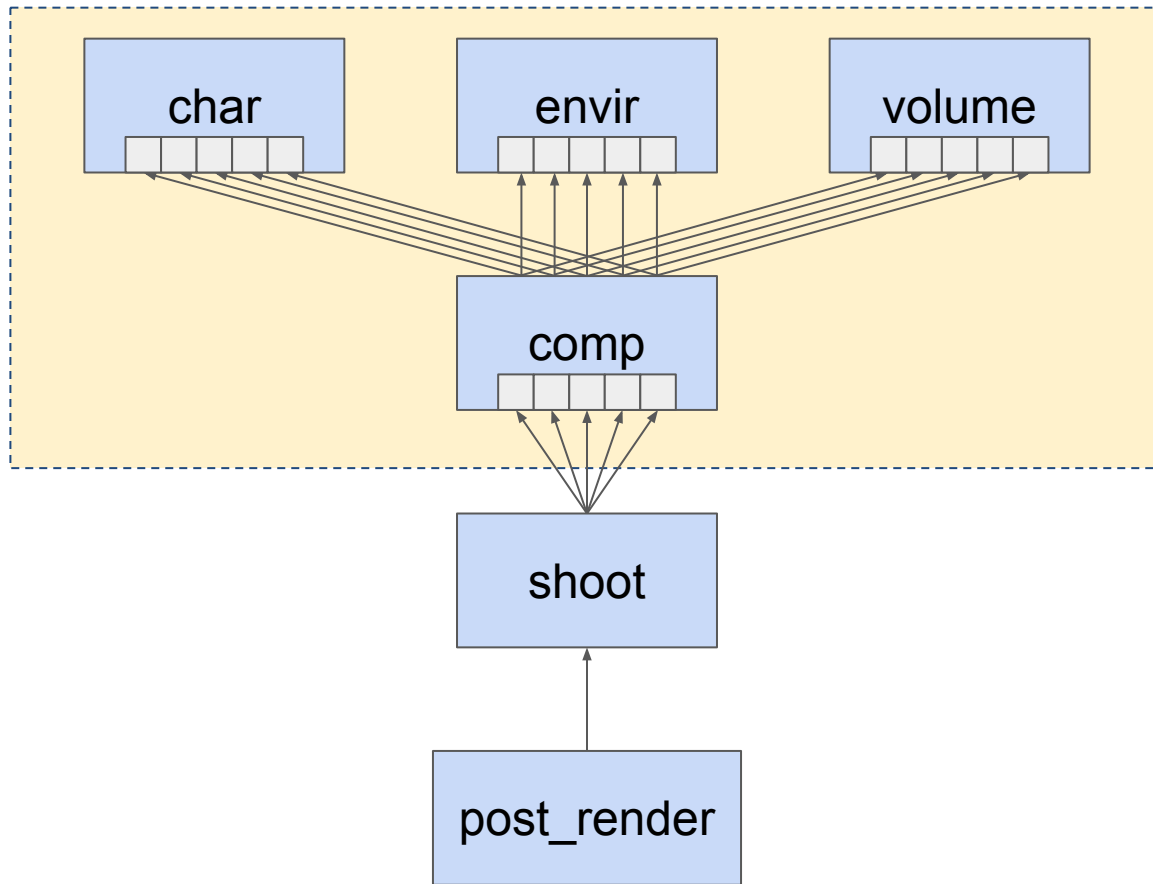






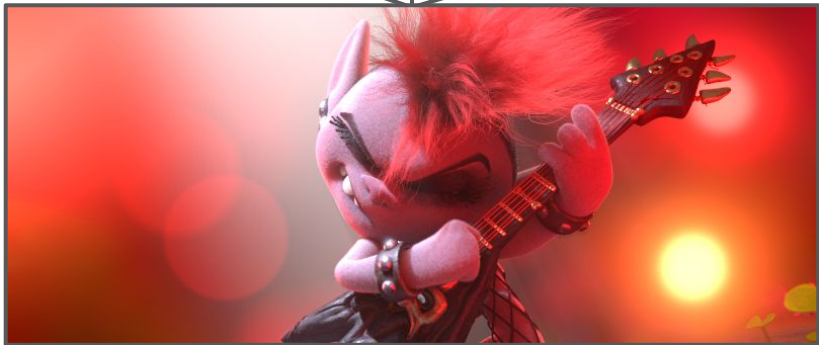
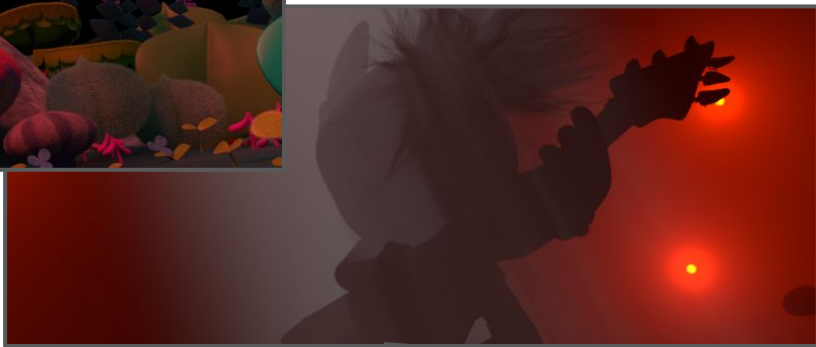
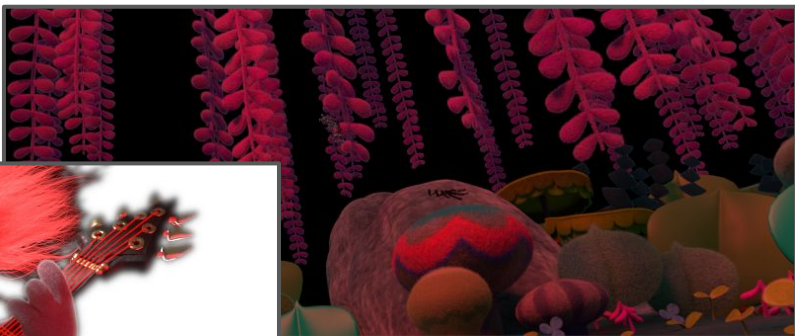
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Typical DAG Submission





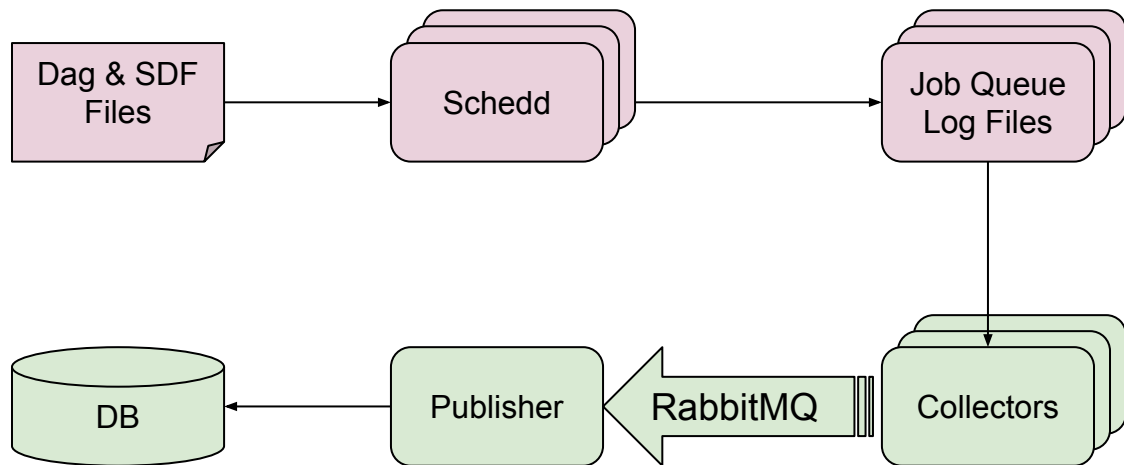
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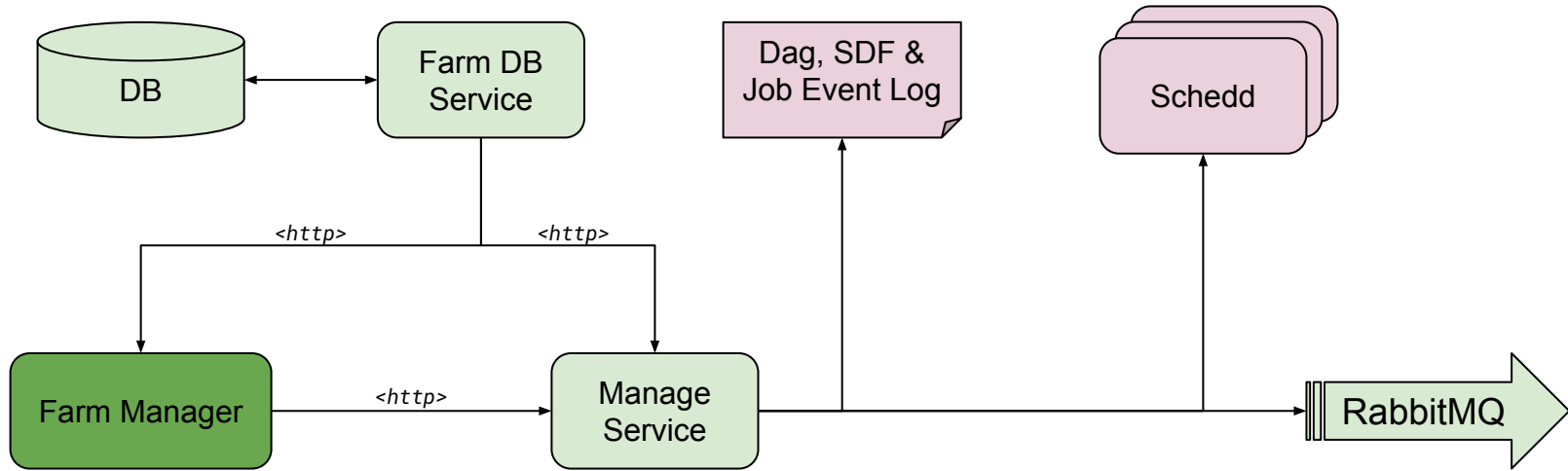
Collecting HTCondor Data



One Collector per Schedd



Rest Service & HTCondor Interaction





Farm DB Service

Pre-defined Queries

- By User
- Production, Department & Team
- Production, Sequence & Shot
- By Host
- All

Time Window Arguments

- Active Now
- 24 hours
- 3 days
- 7 days
- 30 days





Farm Manager

- Web application
- User customizable views
- Movie player & job log viewer
- Actively maintained since 2012
- Has cool logo



Farm Manager Opinionated Decisions

- Artists shouldn't need to use command line
- Artists should be largely unaware of HTCondor
- Support both needs of Ops teams & Artists
- Any time we have to run an HTCondor command should become a new feature
- Must have a cool logo





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Manage Service

- REST Service for interacting with HTCondor & Dagman
- Fetches submission information from DB service
- Most operations require suspending the dagman job to prevent race conditions
- Original version made calls to `condor_qedit`, `condor_rm` ...
- New version makes use of HTCondor Python API





Manage Service Opinionated Decisions

- Actions performed on both active job & unsubmitted jobs in dag transparently to users.
- All are either a "Modification" (classAd via condor_qedit) or an "Operation" (condor_rm, condor_vacate...)
- REST API based on submission, node & joblds
- Classes named following DWA naming conventions (ie. retry not release).





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POST <server>/manage/600095003/1

```
{  
  "jobs": [  
    {"nodeId": 1,  
      "operation": "retry"},  
    {"nodeId": 2,  
      "operation": "retry"},  
    {"nodeId": 3,  
      "operation": "retry"}  
  ]  
}
```





POST <server>/manage/600095003/1

HTTP/1.1 200 OK

{

"data": {

"600095003.1.1": true,

"600095003.1.2": true,

"600095003.1.3": true},

"error": {"errorCode": 0}

}





PUT <server>/manage/600095003/1/3

```
{"operation": "retry"}
```

HTTP/1.1 200 OK

```
{  
  "data": {"600095003.1.3": true},  
  "error": {"errorCode": 0}  
}
```





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Future?



ACTIVE GROUPS

GROUPS BY
USER

| Group ID | User | Status | Actions |
|-----------|-----------|------------|---------|
| | | | |
| 121126862 | dagardner | Hold | |
| 121126901 | dagardner | Hold (dep) | |
| 121127105 | dagardner | Hold (dep) | |
| 121263324 | dagardner | Pend | |
| 121263334 | dagardner | Pend | |
| 121276429 | briley | Hold | |
| 121276481 | eparobek | Run | |
| 121278696 | rsinha | Run | |
| 121278704 | rsinha | Run | |
| 121278710 | rsinha | Run | |
| 121279738 | csprunger | Hold | |

| | Job Set | Node | Status | Actions |
|------|---------|------------|--------|---------|
| ▶ 1 | | CHAR_FG... | Pend | |
| ▶ 2 | | CHAR_FG... | Pend | |
| ▶ 3 | | CHAR_FG... | Pend | |
| ▶ 4 | | CHAR_FG... | Pend | |
| ▶ 5 | | CHAR_LFT | Cancel | |
| ▶ 6 | | CHAR_RGT | Cancel | |
| ▶ 7 | | CIA_LFT | Pend | |
| ▶ 8 | | CIA_RGT | Pend | |
| ▶ 9 | | ENVIR_LFT | Pend | |
| ▶ 10 | | ENVIR_RGT | Run | |
| ▶ 11 | | VOLUME_... | Run | |

| Job Set | Node | Status | Actions |
|---------|-------------|--------|---------|
| ▶ 1 | a | Pend | |
| ▶ 2 | post_render | Pend | |
| | | | Retry |
| | | | Kill |



A large, vibrant collage of DreamWorks Animation characters and creatures. The central focus is the DreamWorks logo, which features a silhouette of a person sitting on a crescent moon, with the text "DREAMWORKS" in a large, blue, serif font and "ANIMATION SKG" in a smaller, blue, sans-serif font below it. Surrounding the logo are numerous characters from various DreamWorks films. In the top left, a man in a white suit with a large 'M' on his chest (Miles Morales) is flying. To his right, a large blue dragon (Snotlout's dragon) is flying. In the top right, a green dragon (Toothless) is flying. Below these, there are characters from Shrek (Shrek, Donkey, Fiona), Kung Fu Panda (Po the panda, Shifu, Tai Lung), Madagascar (Alex the lion, Marty the zebra, Melman the hippo, Gloria the giraffe), How to Train Your Dragon (Hiccup, Toothless), and many others. The background is a bright blue sky with white clouds. The overall composition is a dense, colorful assembly of the studio's diverse cast of characters.