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

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

Quick Farm Stats

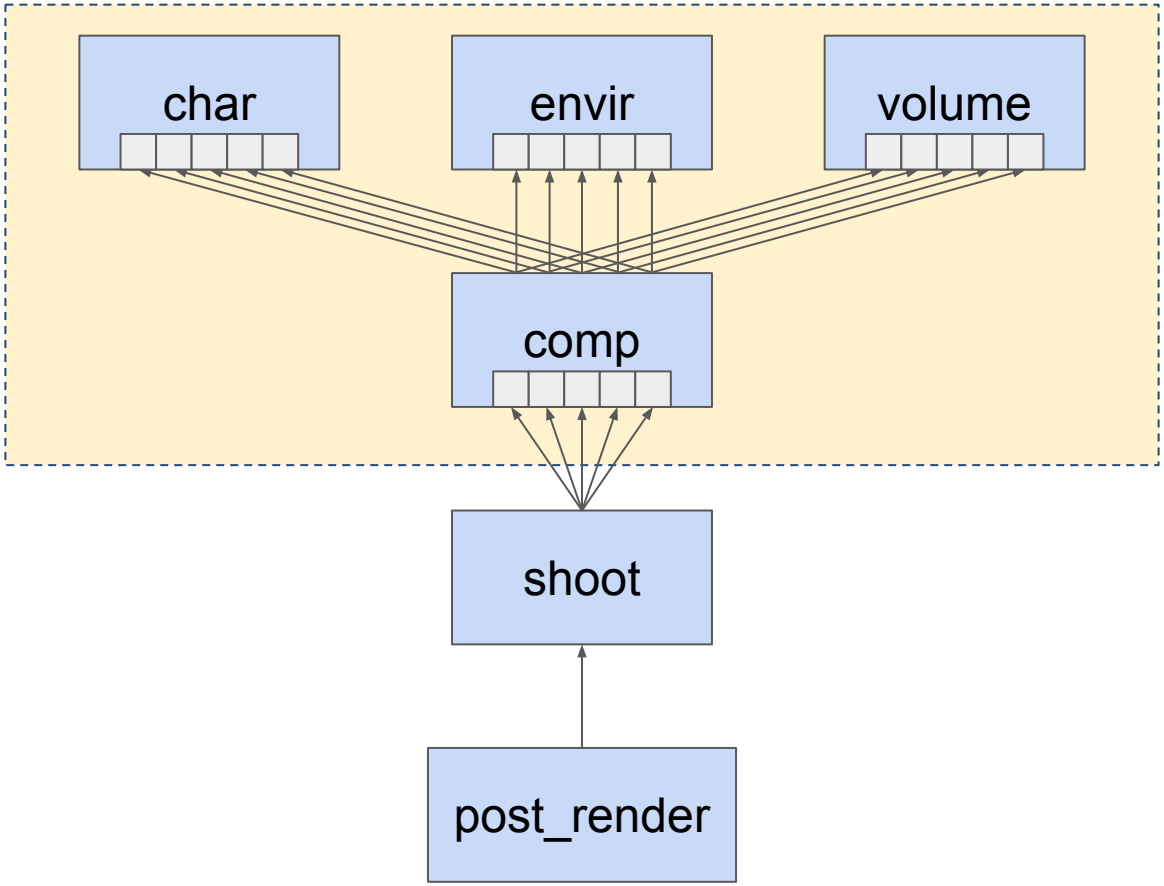
- 925 dedicated hosts
- +700 - 900 Desktops (night & weekends)
- 50k cores / 90k cores
- Typical Host:
  - 96 Cores & 188 GB

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

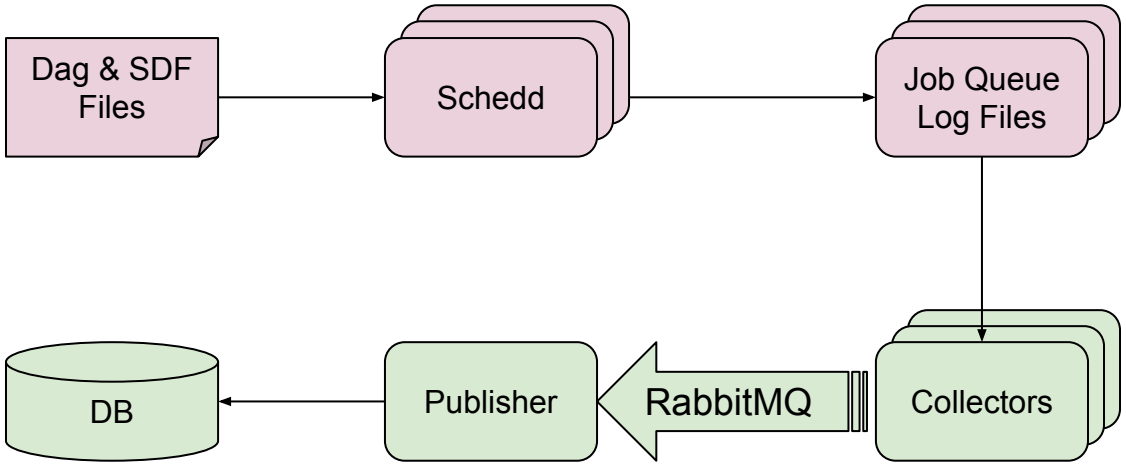
Render Farming 101

- 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"

Typical DAG Submission

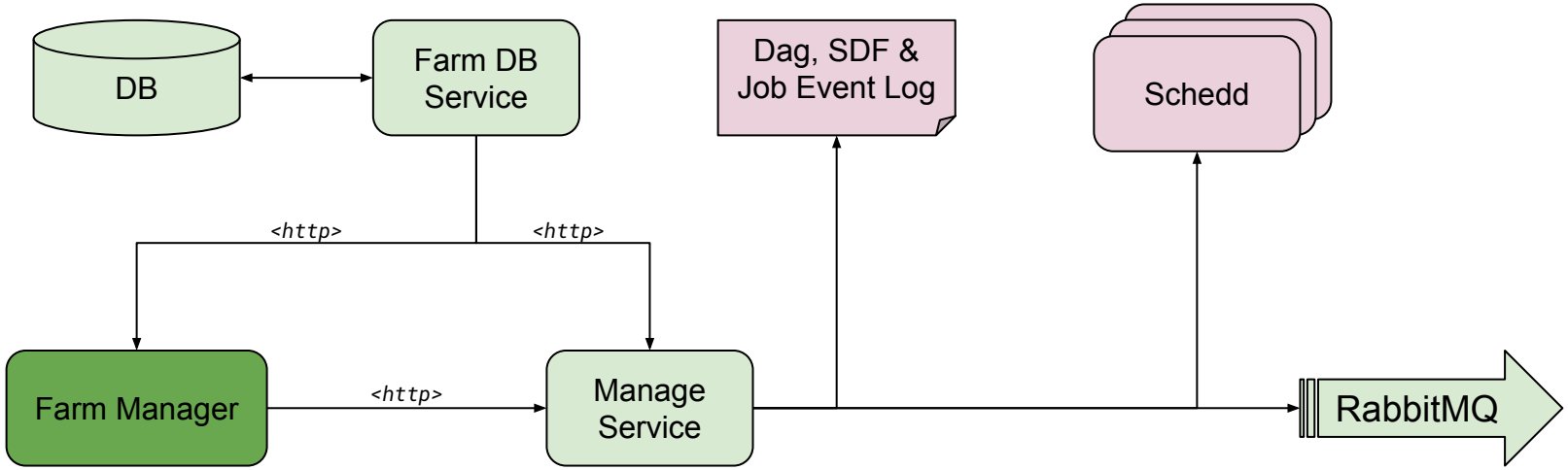


Collecting HTCondor Data



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

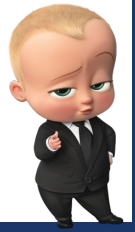
- Active Now
- 24 hours
- 3 days
- 7 days
- 30 days

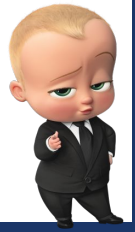
Farm Manager

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

Farm Manager Opinionated Decisions

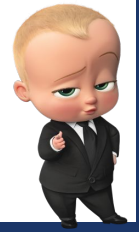
- Artists shouldn't need to use command line
- Artists should be largely unaware of HTCondor
- Support both needs of Ops teams & Artists
- Any time we have to run an HTCondor command should become a new feature
- Must have a cool logo





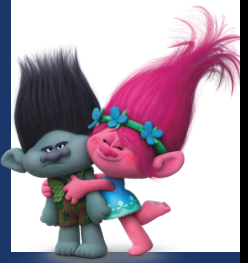
Manage Service

- 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 & jobIds
- Classes named following DWA naming conventions (ie. retry not release).



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}
}
```

Future?

ACTIVE GROUPS

GROUPS BY USER

Group ID	User	Status
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

DREAMWORKS
ANIMATION SKG