



MCWrapper and the OSG

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The use case

- The lowest hanging fruit is in Monte Carlo production
 - Very parallelizeable (each simulated event is independent)
- Had to fight for local resources
 - Higher priority given to data taking and reconstruction
- Desire to run buffered from localized issues
- Given everything above OSG seems an obvious target

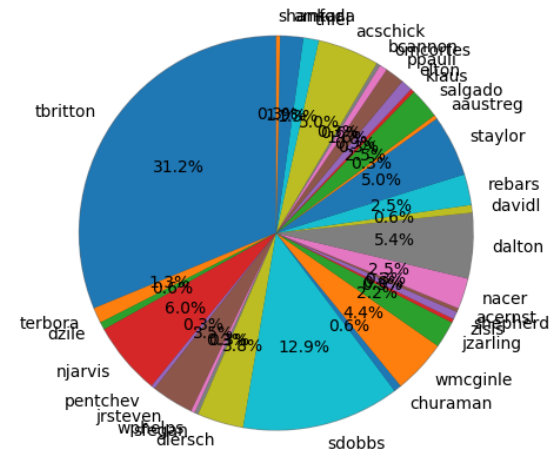
Paved road

- Using the OSG opportunistically has freed HalID/GlueX local cycles for data analysis
 - Utilization of offsite resources is part of the plan to fulfill the computational needs of GlueX et al
- Users of MCwrapper/MCwrapper-bot accept some constraints on running (covers most use cases anyways) in exchange for not having to handle the production
 - Most users don't care where any of it happens. Just that it does happen....



Statistics

- Since July 20 2018
 - 32 unique users (out of 116 members)
 - Produced over 47 TB of MC
 - In more than 700k core-hours



The anatomy of a submit file

Declare universe

what executes

arguments for
exe

node
requirements

container
loc/behavior

job behaviors

needed locations

output

queue it

```
universe = vanilla
Executable = /osgpool/halld/tbritton/gluex_MCwrapper//osg-container.sh
Arguments = ./MakeMC.sh 1 /srv/version recon-ver03_6 jlab.xml /srv/gen_omega_rad
one file:/srv/403_jana.config 50000 ./ batch default batch default 0 rcdb rcdb re
Requirements = (HAS_SINGULARITY == TRUE) && (HAS_CVMFS oasis_opensciencegrid.org
+SingularityImage = "/cvmfs/singularity.opensciencegrid.org/markito3/gluex_docker
+SingularityBindCVMFS = True
+SingularityAutoLoad = True
should_transfer_files = YES
when_to_transfer_output = ON_EXIT
concurrency_limits = GluexProduction
on_exit_remove = true
on_exit_hold = false
Error      = /osgpool/halld/tbritton/REQUESTEDMC_OUTPUT/omega_rad_gend_2gamma_an
output     = /osgpool/halld/tbritton/REQUESTEDMC_OUTPUT/omega_rad_gend_2gamma_an
log = /osgpool/halld/tbritton/REQUESTEDMC_OUTPUT/omega_rad_gend_2gamma_analyzed_2
initialdir = ./
transfer_input_files = /osgpool/halld/tbritton/gluex_MCwrapper//MakeMC.sh, /group
alld_sim-4.1.0/src/programs/Simulation/gen_omega_radiative/gen_omega_radiative_f
jana.config
transfer_output_files = 30848_3
transfer_output_remaps = "30848_3=/osgpool/halld/tbritton/REQUESTEDMC_OUTPUT/omeg
queue
```



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BACKUP

What the user sees

halld_recon version: recon-ver03.3
halld_sim version: 3.7.0
version Set: version_recon-ver03_6_jlab.xml

Run Number 30496 Number of Events 100000

Output Directory Name /lustre/expphy/cache/halld/halld-scratch/REQUESTED_

Generator bggen

Full Path to Generator Config /osgpool/halld/tbritton/REQUESTEDMC_CONFIGS/398

Min Photon E: 3.00 Max Photon E: 11.60

Geant Version: ☒ Geant3 ☐ Geant4

Geant Secondaries? ☒

Background: None

Reaction Filter Reactions Set

☒ Run Generation ☒ Run Geant ☒ Run Smearing ☒ Run Reconstruction
☐ Save Generation ☐ Save Geant ☐ Save Smearing ☒ Save Reconstruction

Additional Comments:

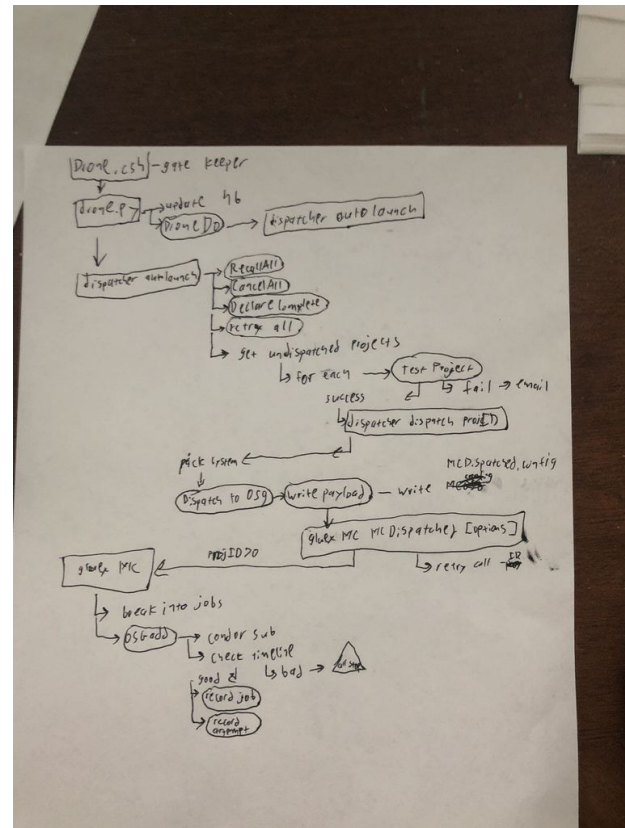
version_recon-ver03_6_jlab.xml

- **created:** 2018-12-17
- **description:** Updates of rcdb, halld_sim, hdgeant4, gluex_root_analysis, and MCwrapper built against recon-ver03.3 tag of halld_recon

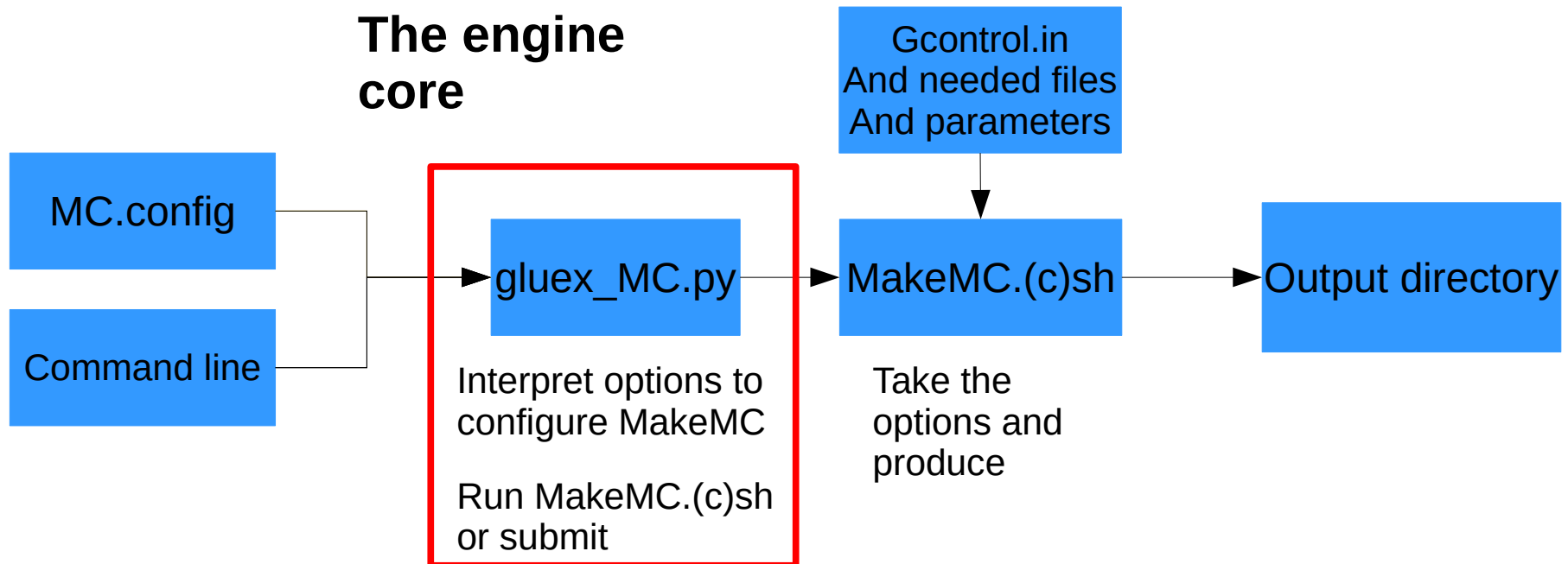
Package	Version	Directory Tag
jana	0.7.9p1	ccdb166
halld_recon	recon-ver03.3	
halld_sim	3.7.0	ver03.3
hdds	recon-2017_01-ver03	
lapack	3.6.0	
cernlib	2005	
xerces-c	3.1.4	
root	6.08.06	
ccdb	1.06.06	
evio	4.4.6	
rcdb	0.03.01	
geant4	10.02.p02	
hdgeant4	1.10.0	ver03.3
hd_utilities	1.14	
gluex_MCwrapper	v2.0.4	
gluex_root_analysis	0.6	ver03.3
amptools	0.9.4	
sqlitecpp	2.2.0	bs130
sqlite	3.13.0	bs130

What really happens

- Once submitted a Rube Goldberg springs into action
 - Many moving pieces
 - Html/css/JS
 - Php/MySQL
 - Python
 - Bash/cshell
- Requests are tested
 - In the environment they should run
 - Not fool proof yet
- Requests are broken into jobs
 - Empirically optimized for OSG
- Jobs are submitted to the OSG



What really happens



- gluex_MC is responsible for interpreting the user and “instructing” MakeMC to Make MC. This includes configuring submit files

The Future

- Fix the potholes
 - Increase throughput and utilization of the OSG
- Prototype reconstruction/analysis on the OSG
- If opportunistic running is the name of the game. Opportunity discovery will be key