



HTCondor and BOINC

A Brief History of BOINC

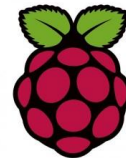
- › Berkeley Open Infrastructure for Network Computing
- › Grew out of SETI@Home, began in 2002
- › Middleware system for volunteer computing

Large Community

- › 50 projects
 - Astronomy/Physics/Chemistry
 - Biology and Medicine
 - Cognitive Science
 - Earth and Environmental Science
 - Mathematics, Computing, and Games
- › 250,000 users
- › 500,000 machines
- › 7.3 PetaFLOPS

Diverse Set of Platforms

- › Windows
- › Linux
- › Mac OS X
- › FreeBSD
- › Android
- › GPUs
- › VirtualBox



Previous Work

- › HTCondor as a BOINC client
- › Backfill state and Work-Fetch Hooks
 - HTCondor execute machine becomes a BOINC client when otherwise idle
- › Now, we're doing the reverse...

Sending Jobs to BOINC

- › New grid universe type: boinc
- › Submit file format very similar to other job types
- › Application must be described to BOINC server first
 - Manual step at present

Submit File

```
universe = grid
grid_resource = boinc http://stress4.chtc.wisc.edu/condorb/
boinc_authenticator_file = condorb.boincauth
initialdir = run$(SEQUENCE)
transfer_input_files = ../rosetta_inputs.zip
executable = rosetta
arguments = $(UTAG) $(SEQUENCE)
UTAG = j0001
SEQUENCE = 1
Queue
...
UTAG = j0400
SEQUENCE = 400
Queue
```

BOINC Application Description

- › Application files
 - Multiple platforms
 - Graphical display
 - Linked with BOINC API library
 - Wrapper available to use existing binaries
- › Input and output filenames
- › Resource usage
 - Disk, memory, runtime
- › Validation code

BOINC Application Description

```
<version>
  <file>
    <physical_name>wrapper</physical_name><main_program/>
  </file>
  <file>
    <physical_name>rosettabin</physical_name><copy_file/>
  </file>
  <file>
    <physical_name>DATABASE3.4.tar.gz</physical_name>
    <copy_file/>
  </file>
  <file>
    <physical_name>rosetta-1.3-job.xml</physical_name>
    <logical_name>job.xml</logical_name><copy_file/>
  </file>
</version>
```

BOINC Input Template

```
<input_template>
  <file_info>
    <number>0</number>
  </file_info>
  <workunit>
    <file_ref>
      <file_number>0</file_number>
      <open_name>rosetta_inputs.zip</open_name>
      <copy_file/>
    </file_ref>
    <rsf_frops_est>53003894400000</rsf_frops_est>
    <rsf_memory_bound>100000000</rsf_memory_bound>
    <rsf_disk_bound>1000000000</rsf_disk_bound>
  </workunit>
</input_template>
```

BOINC Output Template

```
<output_template>
  <file_info>
    <name><OUTFILE_0/></name>
    <generated_locally/><upload_when_present/>
    <max_nbytes>5000000</max_nbytes>
    <url><UPLOAD_URL/></url>
  </file_info>
  <result>
    <file_ref>
      <file_name><OUTFILE_0/></file_name>
      <open_name>rosetta_outputs.zip</open_name>
      <copy_file/><no_validate>1</no_validate>
    </file_ref>
  </result>
</output_template>
```

Availability

- › Will be in HTCondor 8.1.6
- › Experimental
- › Feedback welcome