

Remote Application Environment on BOINC

**Wayne
(Chun-Wei SHEN)
<waynesan@twgrid.org>**

Outline

- Introduction
- Reasons
- Client Side Workflow
- Structure
- Simple Example
- Script Workflow
- Stderr Output
- More Examples
- Challenges
- Problems

Introduction

- We are developing a environment that can take the whole runtime environment such as Java, Terracotta, Python, Octave, Autodock or R-Script to be executed on BOINC (with MS Windows Platform).
- We pack the whole runtime environment in a zip file (or more in the future), then unpack and execute it by a script.
- The script is written by Python, and we convert it into a exe file by py2exe utility.
- It just help us easy to port applications on BOINC.

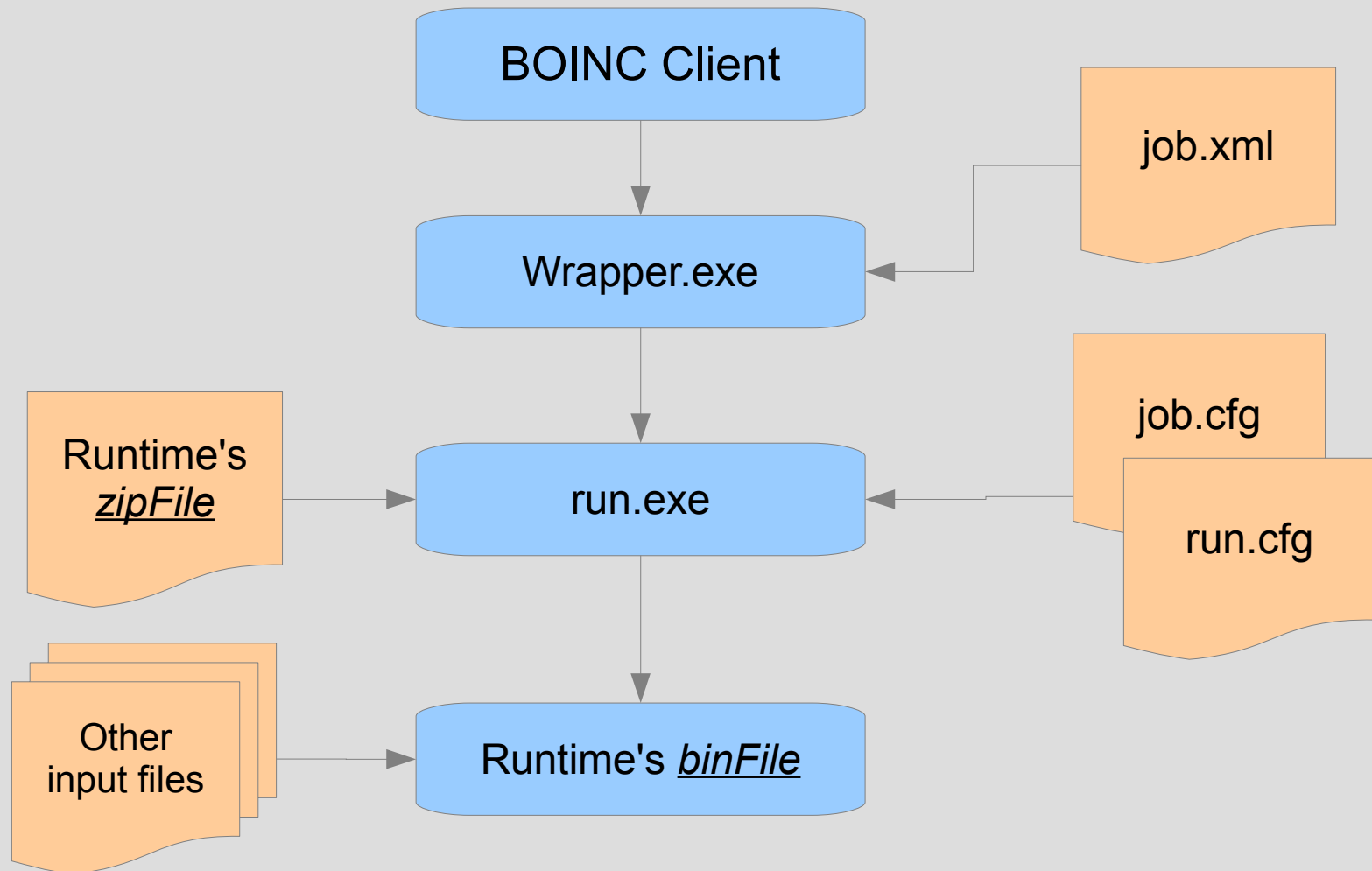
Reasons

- Why are we doing this?
- We already have genWrapper, isn't it?

BUT...

- GenWrapper unpacks the whole zip file to slots directory.
- GenWrapper can just bring only one zip file.
- Maybe we can have another choice for scripting.
- Python is powerful!!!

Client Side Workflow



Structure

- **Application files:**

- wrapper.exe
- job.xml
- run.exe
- py2exe Pack
 - bz2.pyd
 - library.zip
 - python26.dll
 - select.pyd
 - unicodedata.pyd
 - w9xopen.exe
- Runtime's zip file
(e.g. jre.zip)

- **Input files:**

- run.cfg
- job.cfg

- Other files
(e.g. *.class, *.jar)

Simple Example of Octave

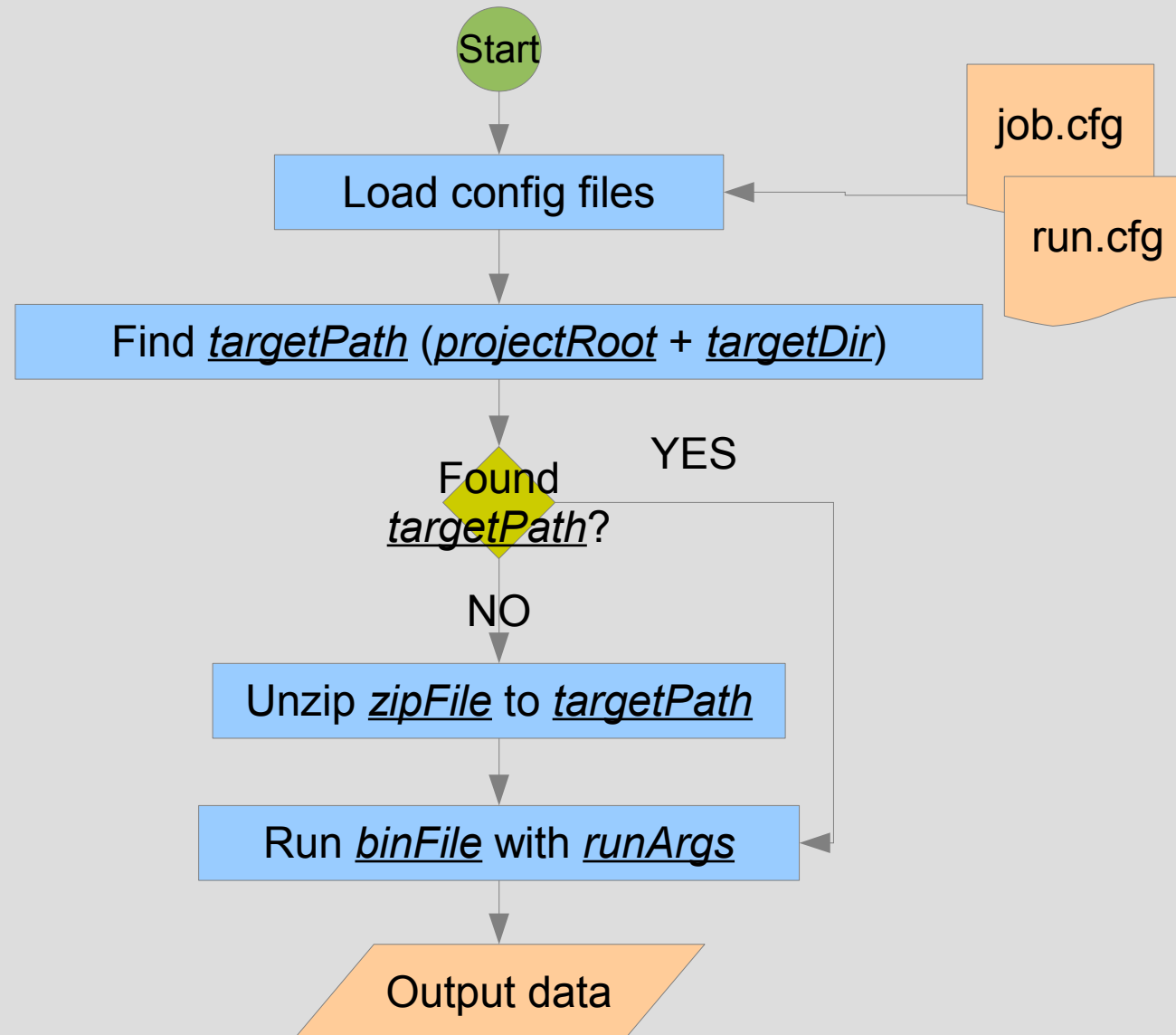
- run.cfg:

```
[run]
projectRoot = "../..../projects/hostname_project"
zipFile = "octave-3.2.3.zip"
targetDir = "octave-3.2.3"
binFile = "bin/octave.exe"
```

- job.cfg:

```
[job]
runArgs = "-q input.txt"
```

Script Workflow



Stderr Output

wrapper: starting

16:25:55 (2424): wrapper: running ../../projects/hostname_project/run.exe (1)

Project Root:

C:\ProgramData\BOINC\projects\hostname_project

Target Path:

C:\ProgramData\BOINC\projects\hostname_project\octave-3.2.3

Not found path

'C:\ProgramData\BOINC\projects\hostname_project\octave-3.2.3'.

Extracting file 'octave-3.2.3.zip' ... done.

Running 'bin/octave.exe' ...

...

<Output By Script>

Running 'bin/octave.exe' ... done.

16:26:15 (2424): called boinc_finish

<Output By Wrapper>

Example of Java (JRE)

- run.cfg:

```
[run]
projectRoot = "../../projects/hostname_project"
zipFile = "jre-1.6.0_18-b07.zip"
targetDir = "jre-1.6.0_18-b07"
binFile = "bin/java.exe"
```

- job.cfg:

```
[job]
runArgs = "hello"
```

Example of Terracotta

- run.cfg:

```
[run]
projectRoot = "../..../projects/hostname_project"
zipFile = "terracotta-3.2.0.zip"
targetDir = "terracotta-3.2.0"
binFile = "bin/dso-java.bat"
```

- job.cfg:

```
[job]
runArgs = "HelloWorld"
```

Example: Workunit Template

```
<file_info><number>0</number></file_info>
<file_info><number>1</number></file_info>
<file_info><number>2</number></file_info>
<workunit>
  <file_ref>
    <file_number>0</file_number>
    <open_name>hello.class</open_name>
    <copy_file/>
  </file_ref>
  <file_ref>
    <file_number>1</file_number>
    <open_name>run.cfg</open_name>
    <copy_file/>
  </file_ref>
  <file_ref>
    <file_number>2</file_number>
    <open_name>job.cfg</open_name>
    <copy_file/>
  </file_ref>
</workunit>
```

Example: Result 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>stdout.txt</open_name>
  </file_ref>
</result>
```

Challenges

- Able to unpack multiple zip files.
- Client side environment detect and dynamic download needed files.
- Able to resolve the filename from boinc client.
- Able to support reporting progress to boinc client.
- Child processes controlling.

Problems

- We got many troubles on compiling pyBoinc api on Windows.
- Such as:

boinc_win.h:103:21: dbghelp.h: No such file or directory

or ...

boinc_win.h:223:1: warning: "SetClassLongPtr" redefined

and several errors about ...

miofile.h:77: error: `std::string' has not been declared