Python 于 web-game 的应用

赖勇浩（http://laiyonghao.com）

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自我介绍

- 网游从业超过 6 年
- 曾在网易、江苏盛典（广州）等公司工作
- 珠三角技术沙龙
- 赖勇浩的编程私伙局
  - pv 1,000,000+
  - csdn blog top100
- twitter/weibo/42qu/CPyUG/gzlug
- 天下盛境
  - 团队建设
  - 项目管理
  - 服务器端
  - 通信与安全
- 斩魂
  - 服务器端
  - AI
- 幻想三国、疯狂石头和泡泡游戏等

启发于……

http://slidesha.re/aGrXfY

http://slidesha.re/fQhtkL

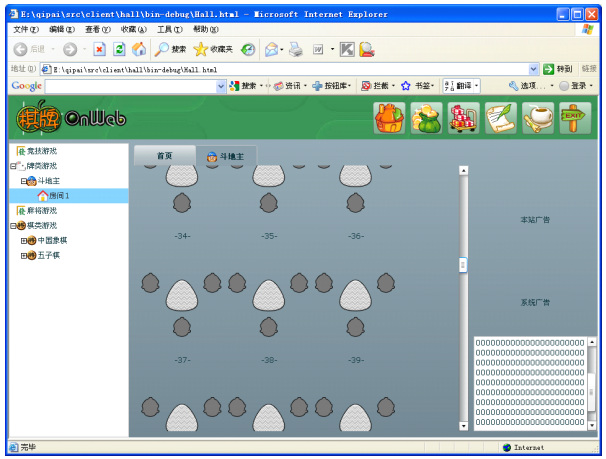
以我经历的项目为蓝本，向大家讲述
web-game 服务器端技术与工具

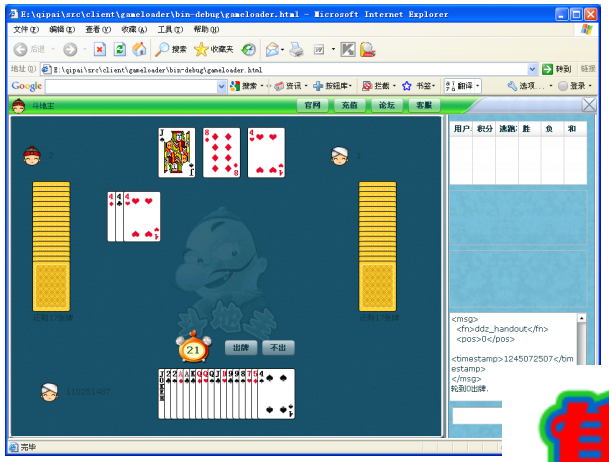
源于项目，高于项目。

项目介绍1

- 天下盛境
  - 横版卷轴
  - 动作类网页游戏
- 0505u.com
- 服务器端完全使用 Python 开发
- 2010.08~现在

项目介绍2

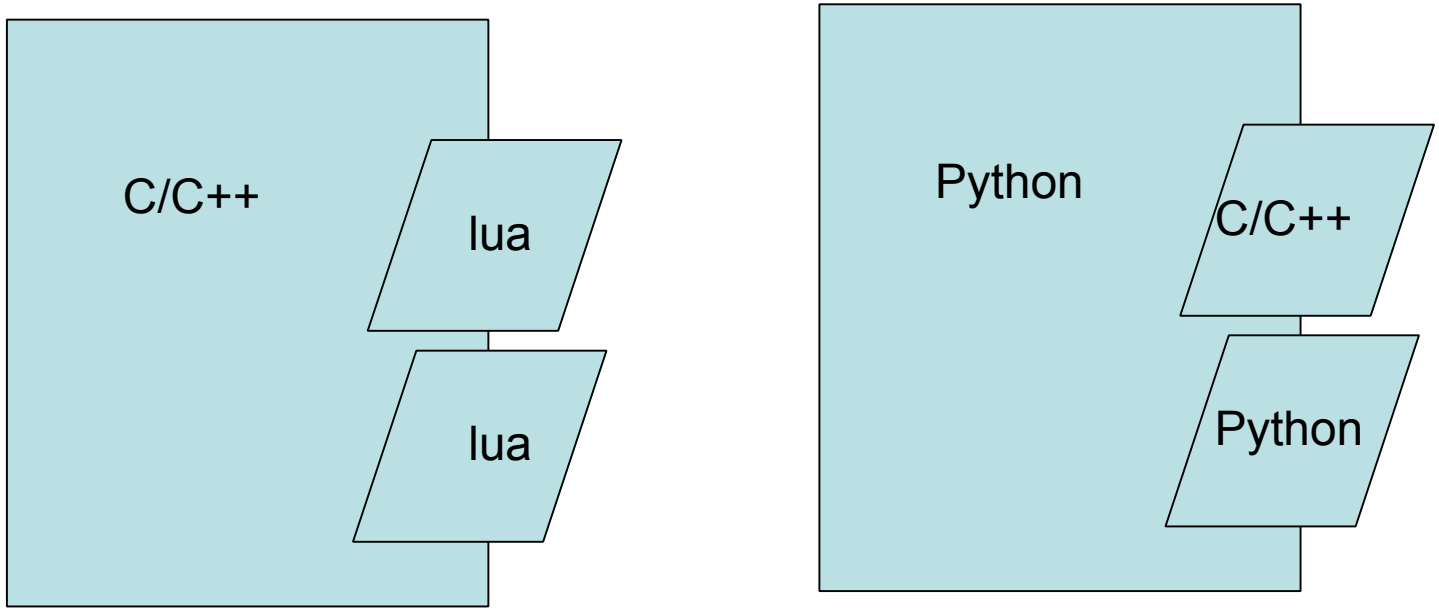




- 棋牌OnWeb
  - QQgame copy cat
- http://qp-demo.laiyonghao.com/client/
- 服务器端完全使用 Python 开发
- 2009.01~2009.03

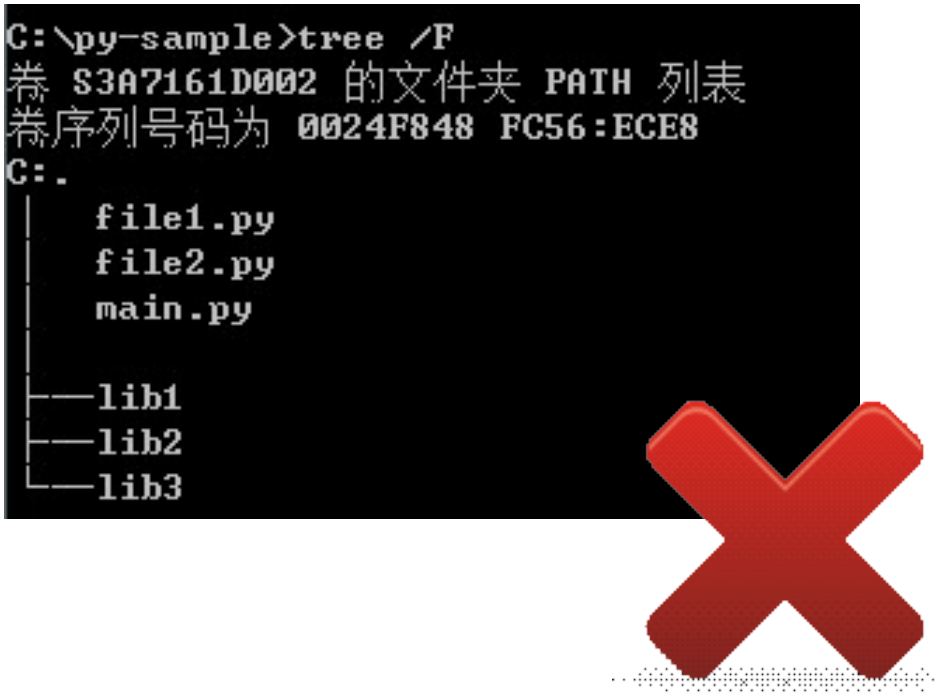
library

Python 在 Python 项目中的位置



大中型 Python 项目

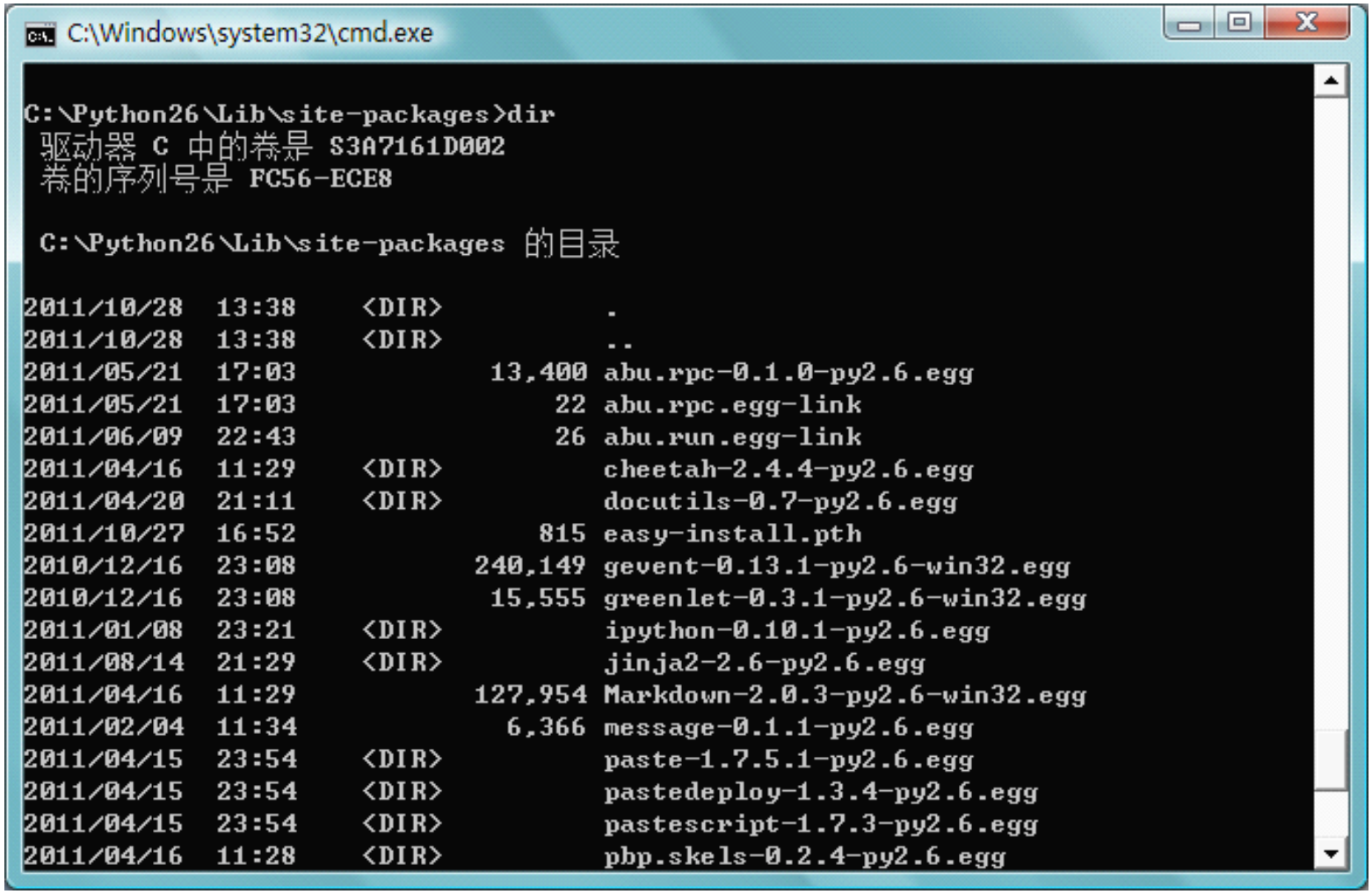
大中型 Python 项目



大中型 Python 项目

```
C:\py-sample>tree /F
卷 S3A7161D002 的文件夹 PATH 列表
卷序列号码为 0024F848 FC56:ECE8
C:.
|   file1.py
|   file2.py
|   main.py
```

lib 应该在 Lib/site-packages 目录



要整这么复杂吗？

就一个 setup.py 而已……

- 避免手写 setup.py
- 如何建立命名空间包

神器 paster

```
C:\abu\abu.rpc>paster help
Usage: paster-script.py [paster_opt

Options:
  --version          show program's
  --plugin=PLUGINS   Add a plugin to
                     specs; will als
  -h, --help         Show this help

Commands:
  create        Create the file layo
  help          Display help
  make-config   Install a package an
  points        Show information abo
  post          Run a request for th
  request       Run a request for th
  serve         Serve the described
  setup-app     Setup an application
```

- http://pypi.python.org/pypi/PasteScript
- 创建、安装、测试、部署、运行
- Many different kinds of projects have created skeletons for their projects (Pylons, TurboGears, ZopeSkel, and others).
- http://pypi.python.org/pypi/PasteDeploy

基本用法

```
C:\abu\abu.rpc>paster create --list-template
Available templates:
  basic_package:     A basic setuptools-enabled package
  paste_deploy:      A web application deployed through paste.deploy
```

```
C:\abu\abu.rpc>paster create -t basic_package my_pkg
Selected and implied templates:
  pastescript#basic_package  A basic setuptools-enabled package

Variables:
  egg:       my_pkg
  package:   my_pkg
  project:   my_pkg
Enter version (Version (like 0.1)) ['']:
```

pbp.skels

- http://pypi.python.org/pypi/pbp.skels
- pbp.skels is a collection of templates to speed up the creation of standardized, boiler-plate code.

```
C:\abu\abu.rpc>paster create --list-template
Available templates:
  basic_package:     A basic setuptools-enabled package
  paste_deploy:      A web application deployed through paste.deploy
  pbp_design_doc:    A Design document
  pbp_module_doc:    A Module helper document
  pbp_package:       A namespaced package
  pbp_recipe_doc:    A recipe document
  pbp_tutorial_doc:  A Tutorial document
```

- paster create -t pbp_package my.package

http://lucasmanual.com/mywiki/PythonPaste

编写自己的 templates, commands

开发、测试、打包、更新

- python setup.py develop
- python setup.py test
- python setup.py bdist
- python setup.py sdist --formats=gztar,zip
- python setup.py register
- python setup.py upload

virtualenv

- http://pypi.python.org/pypi/virtualenv
- Virtual Python Environment builder
- 《Python于Web 2.0网站的应用》介绍过了

plugin

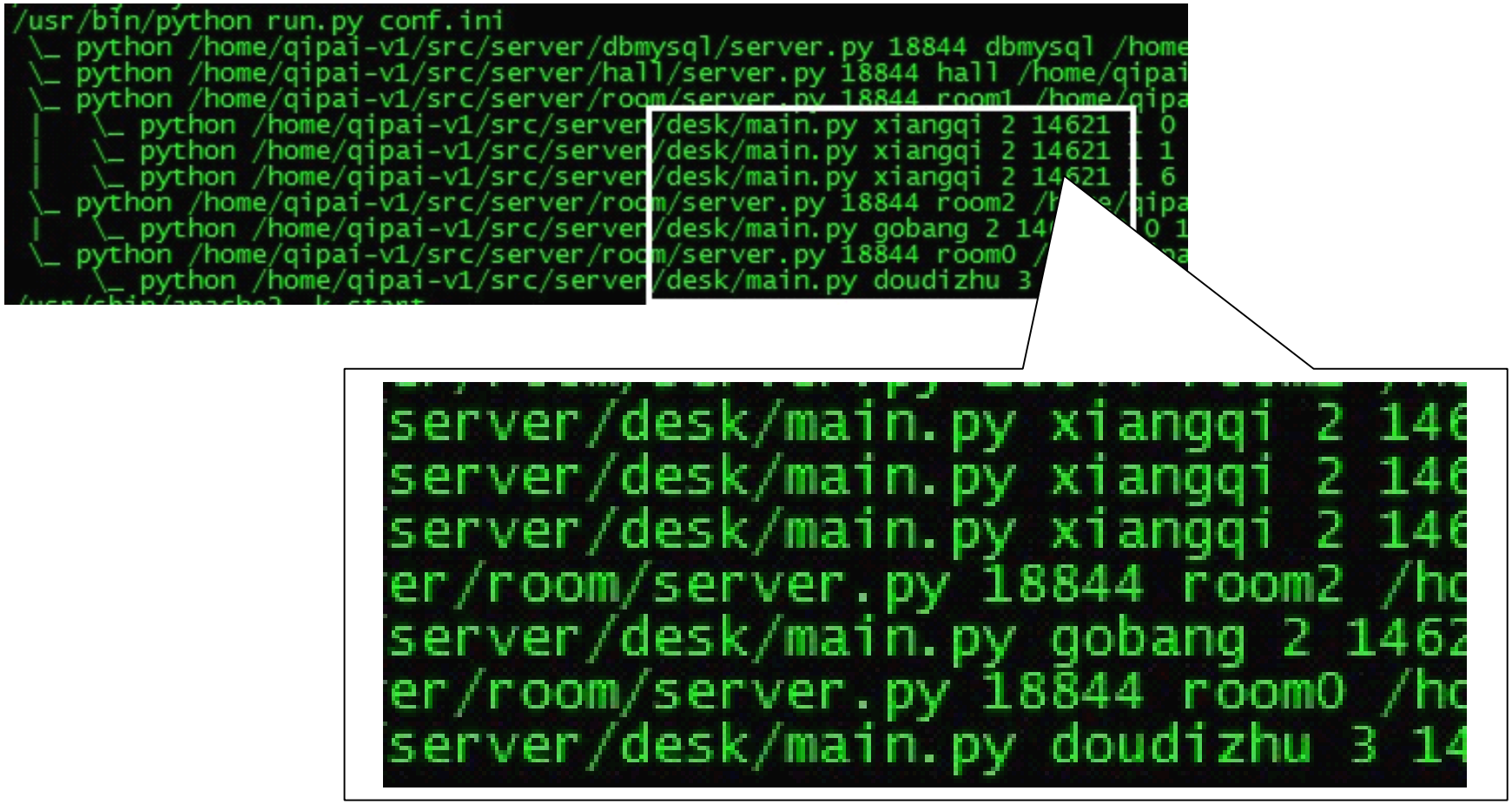
what is the difference between plugin and library?

- A plugin extends the capabilities of a larger application.
- A library is a collection of subroutines or classes used to develop software.

- http://stackoverflow.com/a/2792342

以《棋牌OnWeb》为例……

到后台看看.....


/usr/bin/python run.py conf.ini
_ python /home/qipai-v1/src/server/dbmysql/server.py 18844 dbmysql /home
_ python /home/qipai-v1/src/server/hall/server.py 18844 hall /home/qipai
_ python /home/qipai-v1/src/server/room/server.py 18844 room1 /home/qipa
_ python /home/qipai-v1/src/server/desk/main.py xiangqi 2 14621 1 0
_ python /home/qipai-v1/src/server/desk/main.py xiangqi 2 14621 1 1
_ python /home/qipai-v1/src/server/desk/main.py xiangqi 2 14621 1 6
_ python /home/qipai-v1/src/server/room/server.py 18844 room2 /home/qipa
_ python /home/qipai-v1/src/server/desk/main.py gobang 2 14 0 1
_ python /home/qipai-v1/src/server/room/server.py 18844 room0 /
_ python /home/qipai-v1/src/server/desk/main.py doudizhu 3
server/desk/main.py xiangqi 2 146
server/desk/main.py xiangqi 2 146
server/desk/main.py xiangqi 2 146
er/room/server.py 18844 room2 /ho
server/desk/main.py gobang 2 1462
er/room/server.py 18844 room0 /ho
server/desk/main.py doudizhu 3 14

神器 setuptools

```
C:\qipai-v1\src\server\games\doudizhu>tree /F
卷 S3A7161D002 的文件夹 PATH 列表
卷序列号码为 0022F6E0 FC56:ECE8
C:.
    setup.cfg
    setup.py

└──doudizhu
        ask_rule.py
        ask_status.py
        card.py
        ddz_const.py
        game_impl.py
        game_status.py
        msg_template.py
        player.py
        rule.py
        user.py
        __init__.py
```

setup.py

```
entry_points="""
# -*- Entry points: -*-
[qipaionweb.games]
doudizhu = doudizhu.game_impl:GameImpl
"""
```

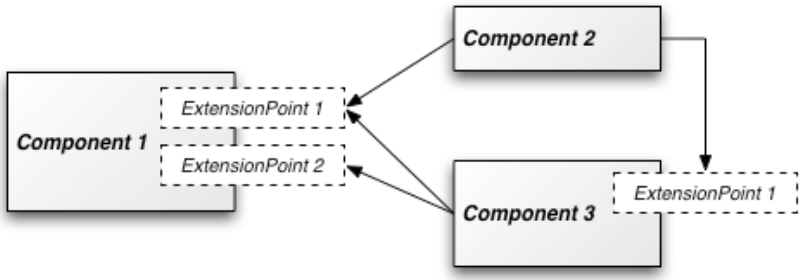
```
def get_game_impl_class(game_name):
    group = 'qipaionweb.games'
    prj = game_name
    return pkg_resources.load_entry_point(
        prj,
        group,
        game_name)
```

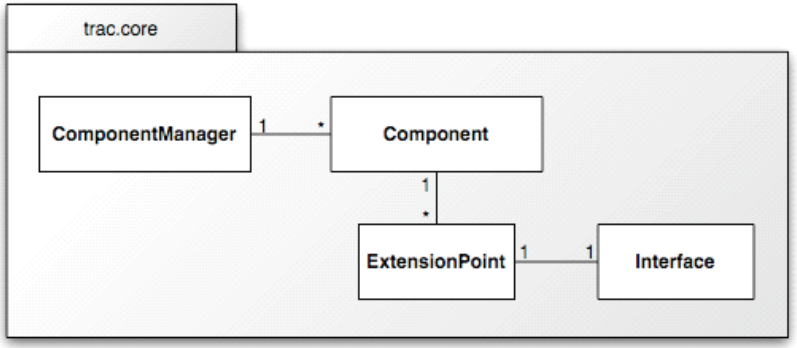
接口与实现

- game_interface
  - 与房间进程交互
  - 通用功能（踢人）
  - 计时器管理
  - 定义接口
- game_impl
  - 实现接口
  - 实现业务逻辑
  - 不接触网络
  - 不接触数据库
  - 单线程

进阶：Trac Component Architecture

- trac.core.ComponentManager
- trac.core.Component
- trac.core.ExtensionPoint
- trac.core.Interface





http://trac.edgewall.org/wiki/TracDev/ComponentArchitecture
http://trac.edgewall.org/wiki/TracDev/PluginDevelopment

参考：ulipad

- http://code.google.com/p/ulipad/source/browse/trunk/modules/Mixin.py
- 另一种 plugin 机制

I/O

I/O needs to be done differently.

```
db.query("select..", function (result) {
  // use result
});
```

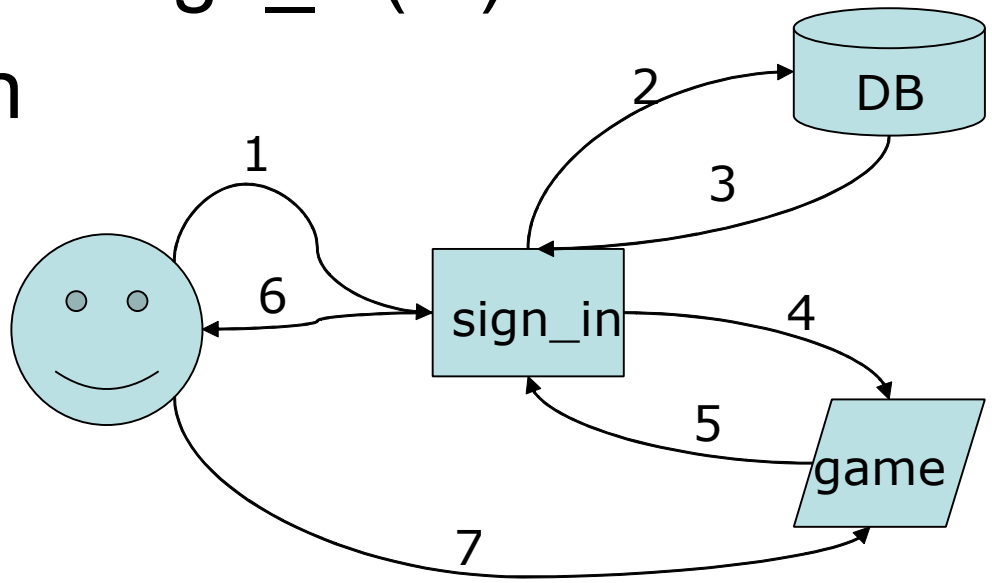
This is how I/O should be done.

http://s3.amazonaws.com/four.livejournal/20091117/jsconf.pdf

协程才是未来！

This is how I/O should be done.

```
def sign_in(username, password):
    result = db.query('select ...')
    if len(result) == 1:
        token = game.sign_in(...)
        return token
```



gevent

gevent = libevent + greenlet

libevent

- 提供指定文件描述符事件发生时调用回调函数的机制
- timeouts, signals

greenlet

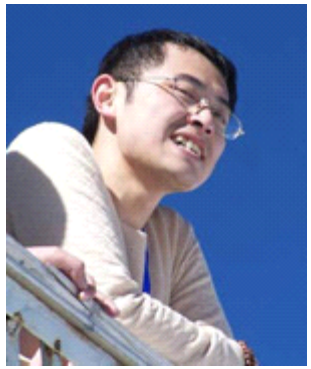
- green thread
  - user space
  - pseudo-concurrently
  - scheduled by VM
  - http://en.wikipedia.org/wiki/Green_threads
- greenlet = python's green thread

echo server

```
from gevent.server import StreamServer
def echo(socket, address):
    fileobj = socket.makefile()
    while True:
        line = fileobj.readline()
        if not line:
            break
        if line.strip().lower() == 'quit':
            print ("client quit")
            break
        fileobj.write(line)
        fileobj.flush()
if __name__ == '__main__':
    server = StreamServer(('0.0.0.0', 6000), echo)
    print ('Starting echo server on port 6000')
    server.serve_forever()
```

参考：eurasia

- http://code.google.com/p/eurasia/



```
from eurasia.web import httpserver, mainloop
def handler(httpfile):
    httpfile.start_response('200 OK', [('Content-Type', 'text/plain')])
    httpfile.sendall('hello world!')
    httpfile.close()

httpd = httpserver('0.0.0.0:8080', handler)
httpd.start()
mainloop()
```

protocol

google protobuf

- http://code.google.com/p/protobuf/
- 协议描述语言
- C++、java、Python and more

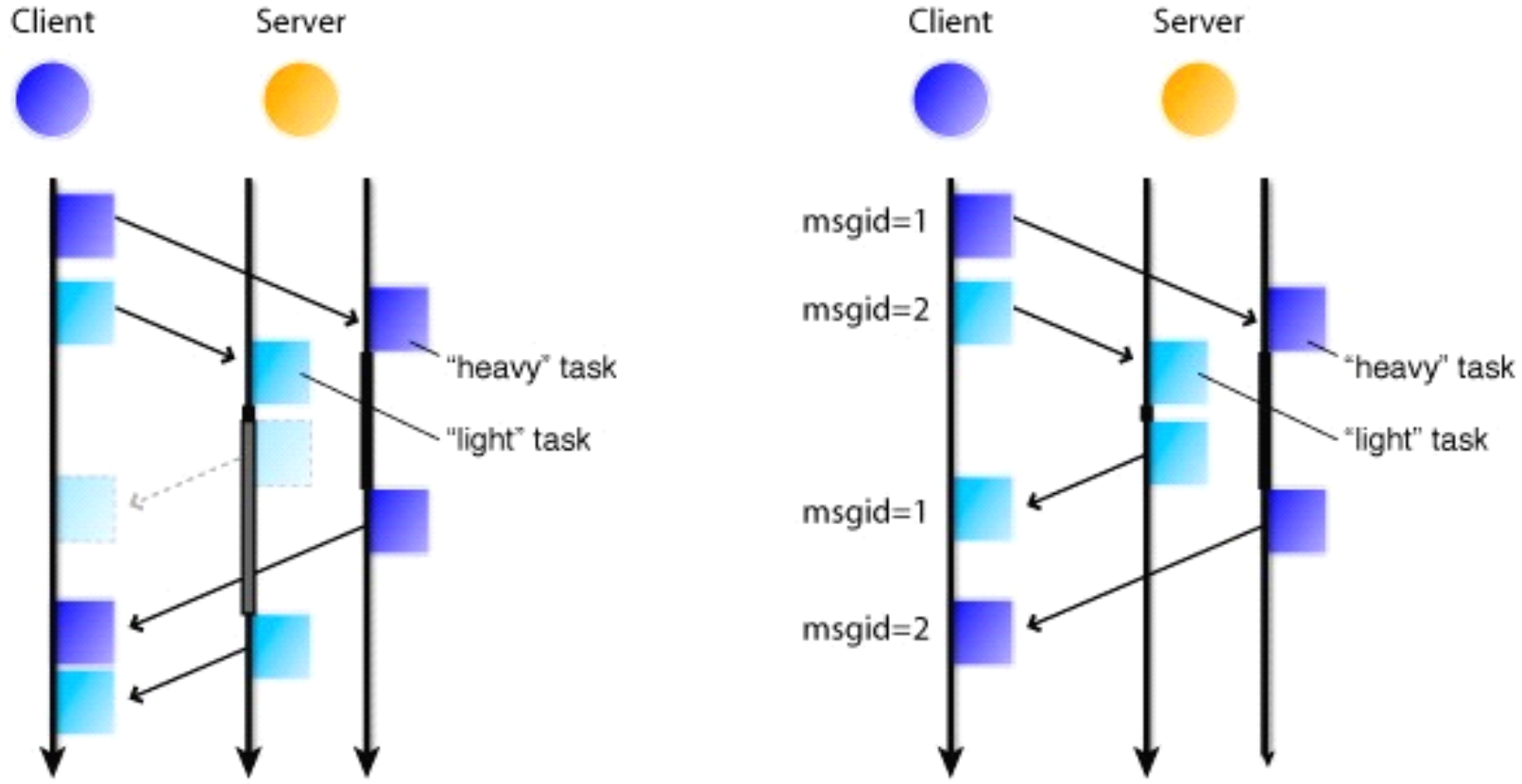
RPC

abu.RPC = gevent + protobuf

abu.RPC

- 更小（得益于 google protobuf）
- 更快（得益于 libevent）
- 同步API（利益于 greenlet）
- 并行管线
- 双向调用

并行管线



http://wiki.msgpack.org/display/MSGPACK/Design+of+RPC

echo server

- import abu.rpc
- import echo_pb2 as echo
- class EchoService(echo.EchoService):
- @abu.rpc.send_return
- def echo(self, controller, request, done):
- return request
- server = abu.rpc.Server(('0.0.0.0', 10086),(EchoService(),))
- print 'serving...'
- server.serve_forever()

publish-subscribe

```
import message
def hello(context, name):
  print 'hello, %s.'%name
message.sub('greet', hello)
message.pub('greet', 'lai')
```

- hello, lai.

python-message

- http://pypi.python.org/pypi/message
- 进程内的 publish-subscribe 机制
- 受 falcon 编程语言启发而写
- http://www.slideshare.net/laiyonghao/pythonmessage010
- 应用于任务、邮件、好友等子系统

utils

absolute32

- http://pypi.python.org/pypi/absolute32
- [-2**31, 2**31-1]
- ubuntu 10.04 LTS 32-bit/64-bit
- python 2.6/3.1
- hash
- add
- crc
- adler

谢谢。
Q&A

http://laiyonghao.com