寻找自我的博客

python网络编程-底层网络

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简单python客户端程序

```
#!/usr/bin/env python
# --coding: utf-8 --
#简单的Gopher Client

import socket,sys

port = 70           #默认端口 70
host = sys.argv[1]
filename = sys.argv[2]

s= socket.socket(socket.AF_INET,socket.SOCK_STREAM)
s.connect((host,port))

s.sendall(filename + "\r\n")

while 1:
  buf = s.recv(2048)
  if not len(buf):
    break
  sys.stdout.write(buf)
```

改进：

```
#!/usr/bin/env python
# --coding: utf-8 --
#简单的Gopher Client

import socket,sys

port = 70           #默认端口 70
host = sys.argv[1]
filename = sys.argv[2]

s= socket.socket(socket.AF_INET,socket.SOCK_STREAM)

try:
  s.connect((host,port))
except socket.gaierror,e:
  print "Error connecting to server:%s" % e
  sys.exit(1)

s.sendall(filename + "\r\n")

while 1:
  buf = s.recv(2048)
  if not len(buf):
    break
  sys.stdout.write(buf)
```

文件类接口重写：

```
#!/usr/bin/env python
# --coding: utf-8 --
#简单的Gopher Client

import socket,sys

port = 70           #默认端口 70
host = sys.argv[1]
filename = sys.argv[2]

s= socket.socket(socket.AF_INET,socket.SOCK_STREAM)
s.connect((host,port))

fd = s.makefile('rw',0)

fd.write(filename + "\r\n")

for line in fd.readline():
  sys.stdout.write(line)
```

简单的服务器程序：

```
#! /usr/bin env python

import socket

host=''
porr=51423

s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
s.setsockopt(socket.SOL_SOCKET,socket.SO_REUSEADDR,1)
s.bind((host,porr))
s.listen(1)

print "server is runing on port %d" % port

while 1:
  clientsock,clientaddr=s.accept()
  clientfile=clientsock.makefile('rw',0)
  clientfile.write("welcome," + str(clientaddr) + "\n")
  clientfile.write("please enter a string:")
  line = clientfile.readline().strip()
  clientfile.write("you enter %d char"  % len(line)  )
  clientfile.close()
  clientsock.close()
```

用urllib实现多种文件下载：

```
#!/usr/bin/env python

import urllib,sys

f=urllib.urlopen(sys.argv[1])

while True:
  buf = f.read(2048)
  if not len(buf):
    break
  sys.stdout.write(buf)
```

连接客户端：

```
#!/usr/bin env python

import socket

print "create socket"
s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
print "done"


print "connecting to the host"
s.connect(('localhost',8888))
print  "done"
```

连接客户端的改进：使用端口名

```
#!/usr/bin env python

import socket

print "create socket"
s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
print "done"

print "look up port number"
port=socket.getservbyname('http','tcp')
print "done"


print "connecting to the host on port %d" % port
s.connect(("www.baidu.com",port))
print  "done"
```

连接客户端的改进：得到信息

```
#!/usr/bin env python

import socket
```

```
print "create socket"
s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
print "done"

print "look up port number"
port=socket.getservbyname('http','tcp')
print "done"


print "connecting to the host on port %d" % port
s.connect(("www.baidu.com",port))
print  "done"

print "connected from",s.getsockname()
print "connected to",s.getpeername()
```

错误处理：

```
#!/usr/bin env python

import socket,sys

host=sys.argv[1]
textport=sys.argv[2]
filename=sys.argv[3]

try:
  s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
except socket.error,e:
  print "strange erroe create socket %s" % e
  sys.exit(1)


try:
  port = int(textport)
except ValueError:
  try:
    port=socket.getservbyname(textport,'tcp')
  except socket.error,e:
    print "could find you port %s" % e
    sys.exit(1)
```

使用UDP的例子：

```
#! /usr/bin env python

import socket,sys

host=sys.argv[1]
textport=sys.argv[2]

s=socket.socket(socket.AF_INET,socket.SOCK_DGRAM)

try:
  port=int(textport)
```

```
except ValueError:
  port=socket.getservbyname(textport,'udp')


s.connect((host,port))

print "enter data to tranmit:"

data=sys.stdin.readline().strip()
s.sendall(data)

print "looking for replies;"

while 1:
  buf=s.recv(2048)
  if not len(buf):
    break
  sys.stdout.write(buf)
```

打印socket属性：

```
#!/usr/bin env python

import socket

solist = [x for x in dir(socket) if x.startswith('SO_') ]
solist.sort()

for x in solist:
  print x
```

基本的服务器程序：

```
#!/usr/bin env python

import socket

host=''
port=8888

s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
s.setsockopt(socket.SOL_SOCKET,socket.SO_REUSEADDR,1)
s.bind((host,port))
print "waiting for connect..."
s.listen(1)

while 1:
  clientsock,clientaddr=s.accept()
  print "Go connection from ,", clientsock.getpeername()
  clientsock.close()
```

UDP的echo服务器：

```
#!/usr/bin env python

import socket,traceback
```

```
host=''
port=8888

s=socket.socket(socket.AF_INET,socket.SOCK_DGRAM)
s.setsockopt(socket.SOL_SOCKET,socket.SO_REUSEADDR,1)
s.bind((host,port))

while 1:
  try:
    message,address=s.recvfrom(8192)
    print "Go data from",address
    s.sendall(message,address)
  except (keyboardInterrupt,SystemExit):
    raise
  except:
    traceback.print_exc()
```

python的syslog的用法：

```
#!/usr/bin env python
#!--coding: utf-8--

import syslog,StringIO,sys,os,traceback

def logexception(includetraceback=0):
  exctype,exception,exctraceback=sys.exc_info()
  excclass=str(exception.__class__)
  message=str(exception)

  if not includetraceback:
    syslog.syslog(syslog.LOG_ERR,"%s: %s" % (excclass,message))
  else:
    excfd=StringIO.StringIO()
    traceback.print_exception(exctype,exception,exctraceback,None,excfd)

    for line in excfd.getvalue().split("\n"):
      syslog.syslog(syslog.LOG_ERR,line)

def initsyslog():
  syslog.openlog("%s[%d]" % (os.path.basename(sys.argv[0]),os.getpid()),0,
    syslog.LOG_DAEMON)
  syslog.syslog("started.")


initsyslog()
try:
  raise RuntimeError, "Exception 1"
except:
  logexception(0)

try:
  raise RuntimeError, "Exception 2"
except:
  logexception(1)

syslog.syslog("I am a terimiting.")
```

TCP的echo服务器：

```
#!/usr/bin env python
#!--coding: utf-8 --

import socket,traceback

host=''
port=8888

s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
s.setsockopt(socket.SOL_SOCKET,socket.SO_REUSEADDR,1)
s.bind((host,port))
s.listen(1)

while 1:
  try:
    clientsock,clientaddr=s.accept()
  except KeyboardInterrupt:
    raise
  except:
    traceback.print_exc()
    continue

  try:
    print "Got connection from " ,clientsock.getpeername()
    while 1:
      data= clientsock.recv(4096)
      if not len(data):
        break
      clientsock.sendall(data)
  except (KeyboardInterrupt,SystemExit):
    raise
  except:
    traceback.print_exc()
    try:
      clientsock.close()
    except KeyboardInterrupt:
      raise
    except:
      traceback.print_exc()
```

TCP的echo客户端：这里出现的问题涉及到死锁。请参看资料。

```
#!/usr/bin env python

import sys,socket

host='localhost'
port=8888

data="x"*1024

s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
s.connect((host,port))
```

```
bytewritten=0
while bytewritten < len(data):
  startpos=bytewritten
  endpos=min(bytewritten + 1024,len(data))
  bytewritten += s.send(data[startpos:endpos])
  sys.stdout.write("write %d bytes\r" % bytewritten)
  sys.stdout.flush()

s.shutdown(1)

print "All data sent"
while 1:
  buf=s.recv(1024)
  if not len(buf):
    break
  sys.stdout.write(buf)
```

根据域名查ip：

```
#!/usr/bin env python

import socket,sys

s=socket.getaddrinfo(sys.argv[1],None,0,socket.SOCK_STREAM)

counter=0
for i in s:
  print "%d %s" % (counter,s[counter][4])
  counter += 1
```

根据host查地址：

```
#!/usr/bin env python

import sys,socket

try:

  s=socket.gethostbyaddr(sys.argv[1])

  print "hostname:"
  print " "+ s[0]

  print "\nAddress:"
  for i in s[2]:
    print " " + i

except socket.herror,e:
  print "can not look up name:",e
```

DNS模块使用：

```
#!/usr/bin env python

import sys,DNS

query=sys.argv[1]
DNS.DiscoverNameServers()

reqobj=DNS.Request()

answerobj=reqobj.req(name=query,qtype=DNS.Type.ANY)
if not len(answerobj.answers):
  print "not find"
for i in answerobj.answers:
  print "%-5s %s " % (i['typename'],i['data'])
```

获取操作系统信息：

```
#!/usr/bin env pythhon

import sys,socket

def getipaddrs(hostname):
  s=socket.getaddrinfo(hostname,None,0,socket.SOCK_STREAM)
  return [x[4][0] for x in s]

hostname=socket.gethostname()
print "Host name:",hostname

print "full-name:",socket.getfqdn(hostname)
try:
  print "IP address:",", ".join(getipaddrs(hostname))
except socket.gaierror,e:
  print "can not get ip address",e
```

广播服务器：

```
#!/usr/bin env python

import sys,socket

dest=('<broadcast>',8888)

s=socket.socket(socket.AF_INET,socket.SOCK_DGRAM)
s.setsockopt(socket.SOL_SOCKET,socket.SO_BROADCAST,1)
s.sendto("hello",dest)

print "look for replies ...."
while 1:
  (buf,address)=s.recvfrom(2048)
  if not len(buf):
    break
  print "Recived from %s: %s" % (address,buf)
```

广播客户端：

```
#!/usr/bin env python

import socket,traceback

host=''
port=8888


s=socket.socket(socket.AF_INET,socket.SOCK_DGRAM)
s.setsockopt(socket.SOL_SOCKET,socket.SO_REUSEADDR,1)
s.setsockopt(socket.SOL_SOCKET,socket.SO_BROADCAST,1)
s.bind((host,port))

while 1:
  try:
    message,address=s.recvfrom(8192)
    print "Got data from",addrrss
    s.sendto("I am here",address)
  except (KeyboardInterrupt,SystemExit):
    raise
  except:
    traceback.print_exc()
```

字符串编码的问题：

```
#!/usr/bin env python

import struct,sys

def htons(num):
  return struct.pack('!H',num)

def htonl(num):
  return struct.pack('!I',num)

def ntohs(data):
  return struct.unpack('!H',data)[0]

def ntohl(data):
  return struct.unpack("!I",data)[0]

def sendstring(data):
  return htonl(len(data)) + data

print "Enter a string:"
str=sys.stdin.readline().rstrip()

print repr(sendstring(str))
```

使用poll()的客户端：

```
#!/usr/bin env python

import socket,sys,select
port=8888
host='localhost'
```

```
spinsize=10
spinpos=0
spindir=1

def spin():
  global spinsize,spinpos,spindir
  spinstr='.' * spinpos + '|'+'.'(spinsize-spinpos-1)
  sys.stdout.write('r'+ spinstr + ' ')
  sys.stdout.flush()

  spinpos += spindir
  if spinpos < 0:
    spindir=1
    spinpos=1
  elif spinpos >= spinsize:
    spinpos -= 2
    spindir = -1

s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
s.connect((host,port))

p=select.poll()
p.register(s.fileno(),select.POLLIN | select.POLLERR | select.POLLHUP)

while 1:
  results=p.poll(50)
  if len(results):
    if results[0][1] == select.POLLIN:
      data = s.recv(4096)
      if not len(data):
        print "Remote end closed connect"
        break
      sys.stdout.write("\rReceived:" + data)
      sys.stdout.flush()
    else:
      print "\rproblem occurred ; exiting"
      sys.exit(0)

spin()
```

使用select()的客户端：

```
#!/usr/bin env python

import socket,sys,select
port=8888
host='localhost'

spinsize=10
spinpos=0
spindir=1

def spin():
  global spinsize,spinpos,spindir
  spinstr='.' * spinpos + '|' +'.'*(spinsize-spinpos-1)
  sys.stdout.write('r'+ spinstr + ' ')
  sys.stdout.flush()
```

```
  spinpos += spindir
  if spinpos < 0:
    spindir=1
    spinpos=1
  elif spinpos >= spinsize:
    spinpos -= 2
    spindir = -1

s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
s.connect((host,port))

while 1:
  infds,outfds,errfds=select.select([s],[],[s],0.05)
  if len(infds):
    data=s.recv(4096)
  if not len(data):
    print "\rRemote end closed connection; exiting"
    break

  sys.stdout.write("\rRecived: " + data)
  sys.stdout.flush()

  if len(errfds):
    print "\r problem occurred; exiting"
    sys.exit(0)

spin()
```

测试poll和select的超时服务器：

```
#!/usr/bin env python

import socket,traceback,time

host=''
port=8888

s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
s.setsockopt(socket.SOL_SOCKET,socket.SO_REUSEADDR,1)
s.bind((host,port))

s.listen(1)


while 1:
  try:
    clientsock,clientaddr= s.accept()
```

```
  except KeyboardInterrupt:
    raise
  except:
    traceback.print_exc()
    continue

  try:
    print "get connect from",clientsock.getpeername()
    while 1:
      try:
        clientsock.sendall(time.asctime() + "\n")
      except:
        break
      time.sleep(5)
  except (KeyboardInterrupt,SystemExit):
    raise
  except:
    traceback.print_exc()
try:
  clientsock.close()
except KeyboardInterrupt:
  raise
except:
  traceback.print_exc()

try:
   clientsock.close()
except KeyboardInterrupt:
   raise
except:
  traceback.print_exc()
```