芯雲流程引擎

使用Python协程解决阻塞问题

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Service Orchestration

DNS 系统	接入层 系统
告警 系统	配置管理 系统
Game Server	SA 系统
IaaS 系统	官网 系统

Python with @task

```python
# -*- coding: utf-8 -*-
from bpm.kernel import *
from bk import http
from bk import cc
from bk import gslb
from bk import res
from bk import ijobs

@task
def expand_capacity():
    ip = res.request_new_server(model='B6')
    cc.update_module(ip, module='GameSvr')
    ijobs.exec_job(ip, job_name='deploy')
    gslb.add_ip_to_domain(domain='abc.com', ip=ip)
```

阻塞问题

result = call_func()

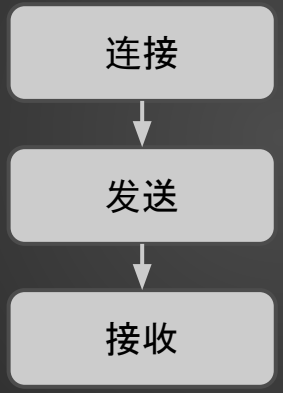
result 无法立即获得，所谓“阻塞”

I/O 阻塞

bytes = tcp_socket.recv(4096)

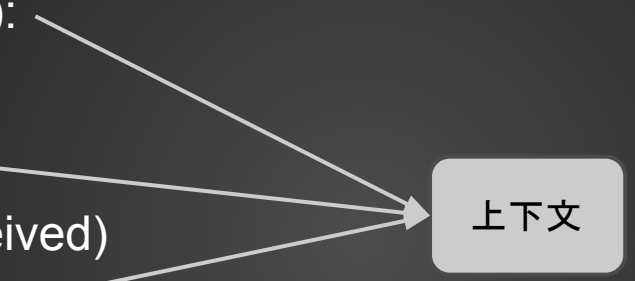
网络I/O操作需要时间，所谓“I/O 阻塞”

例子



回调

```
def on_received(bytes):
    …..
def on_sent(sock):
    sock.recv(on_received)
def on_connect(sock):
    sock.send(‘xxx’, on_sent)
connect(‘a.b.c.d’, on_connect)
```



CALLBACK HELL

Logic Locality

最小化开发人员阅读流程代码的眼球移动距离

协程可以表达I/O阻塞


```
def some_process():
  sock = connect(‘a.b.c.d’, on_connect)
  sock.send(‘xxx’)
  bytes = sock.recv(on_received)
  ….
```

流程阻塞

ip = res.request_new_server(model=’B6’)

调用“外部系统”需要时间，所谓“流程阻塞”

流程阻塞

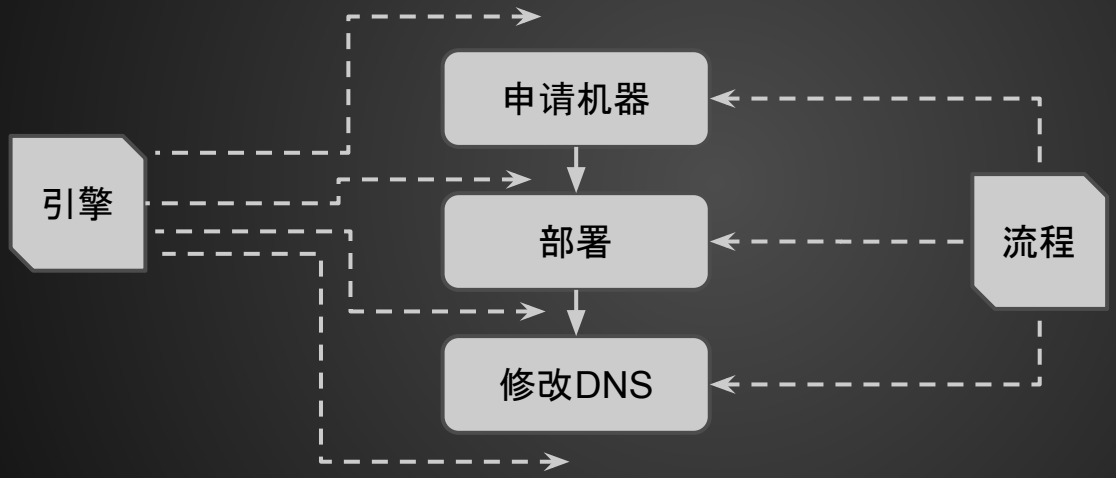
yes_no = smcs.wechat_approve(‘reboot?’)

人工审批需要时间，所谓“流程阻塞”

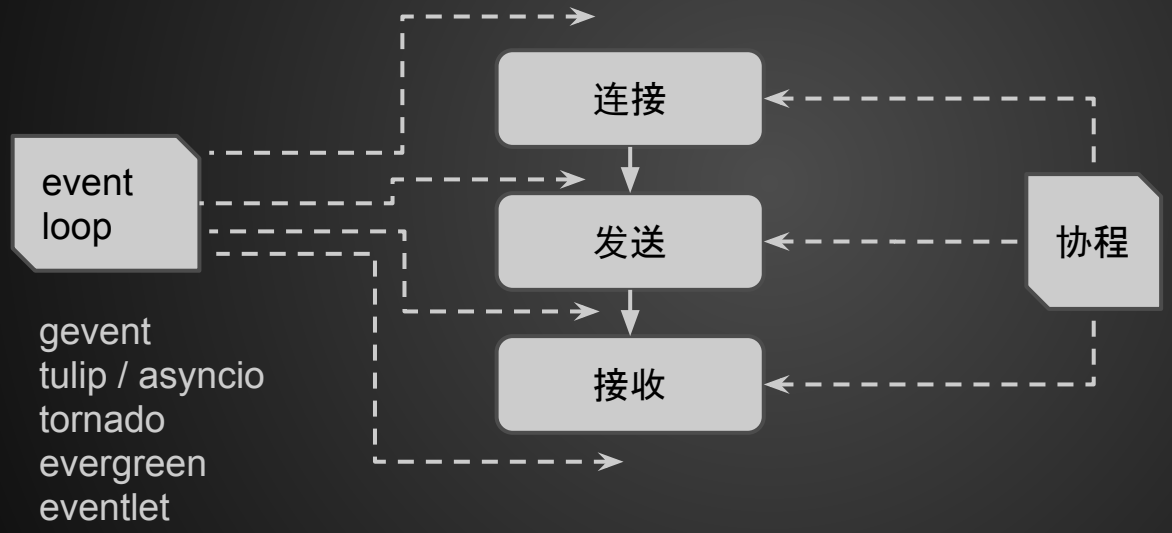
协程也可以表达流程阻塞

```
def some_process():
  ip = res.request_new_server(model=’B6’)
  yes_no = smcs.wechat_approve(‘deploy %s?’ % ip)
  if yes_no:
    ijobs.exec_job(‘deploy’, ip)
```

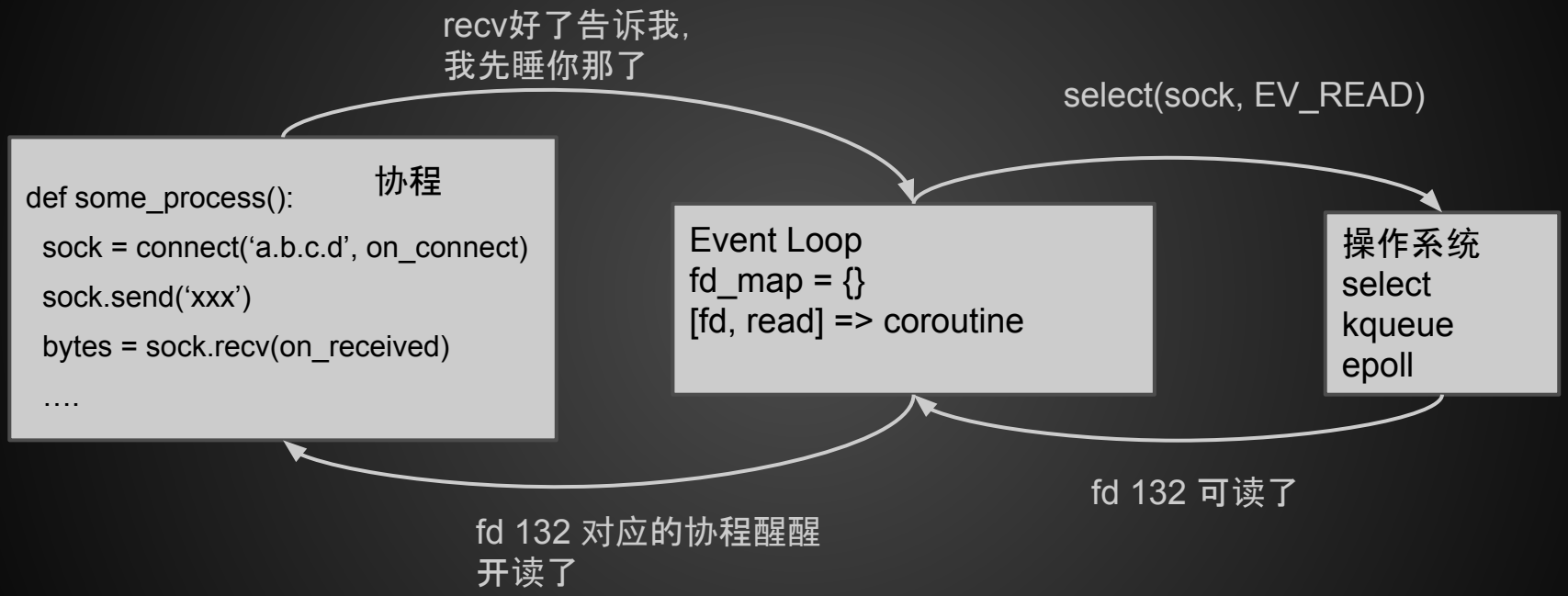
流程引擎



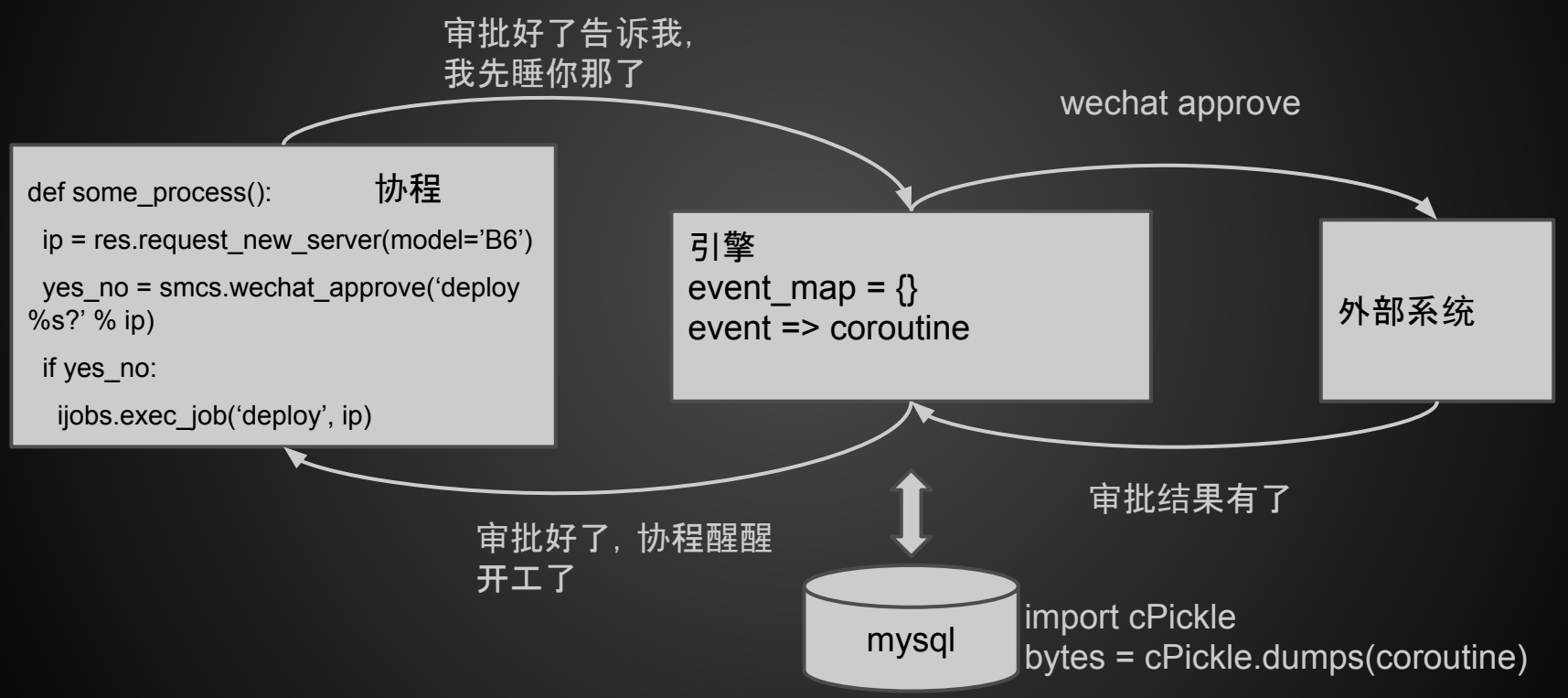
各式Event Loop



所谓Event Loop



协程可以存数据库的


审批好了告诉我，
我先睡你那了
wechat approve
def some_process():
协程
ip = res.request_new_server(model='B6')
yes_no = smcs.wechat_approve('deploy %s?' % ip)
if yes_no:
ijobs.exec_job('deploy', ip)
引擎
event_map = {}
event => coroutine
外部系统
审批结果有了
审批好了，协程醒醒
开工了
mysql
import cPickle
bytes = cPickle.dumps(coroutine)

Python协程实现

- yield
- stackless python / pypy
- greenlet / python-fibers / stacklet / libgevent

Ultimate Coroutine Scheduler

- 语言：Java for true parallelism
- 协程：co-routine with bytecode weaver
- I/O阻塞：包装NIO
- 流程阻塞：event map，持久化可选

https://github.com/taowen/daili

协程大法好

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