Type uWSGI;
Press Enter;
What Happens?

Philip James — @phildini
DjangoCon US 2017

#typeuwsgi

uWSGI…?

The uWSGI project

The uWSGI project aims at developing a full stack for building hosting services.

Application servers (for various programming languages and protocols), proxies, process managers and monitors are all implemented using a common api and a common configuration style.

Thanks to its pluggable architecture it can be extended to support more platforms and languages.

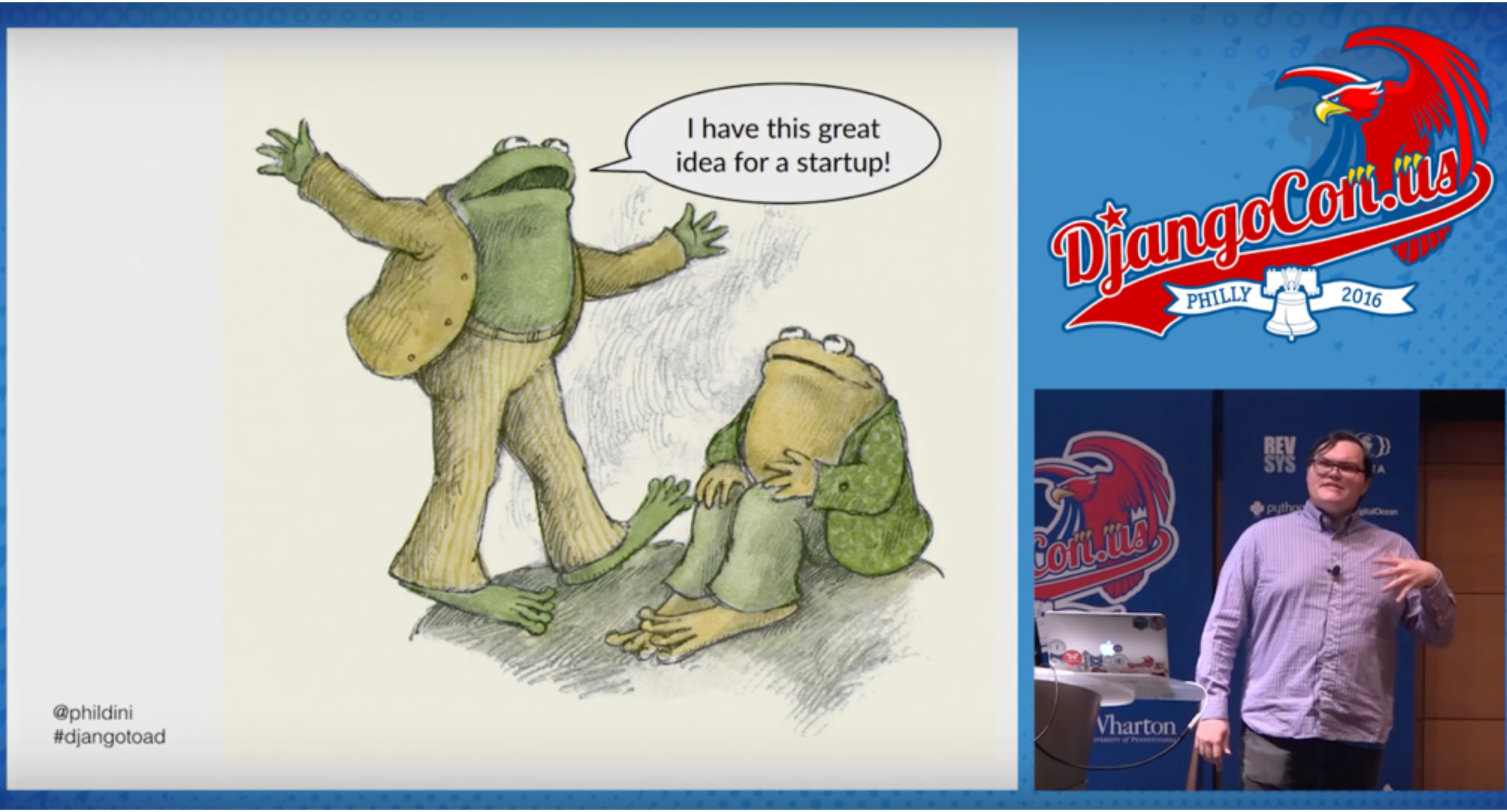
Currently, you can write plugins in C, C++ and Objective-C.

The "WSGI" part in the name is a tribute to the namesake Python standard, as it has been the first developed plugin for the project.

Versatility, performance, low-resource usage and reliability are the strengths of the project (and the only rules followed).

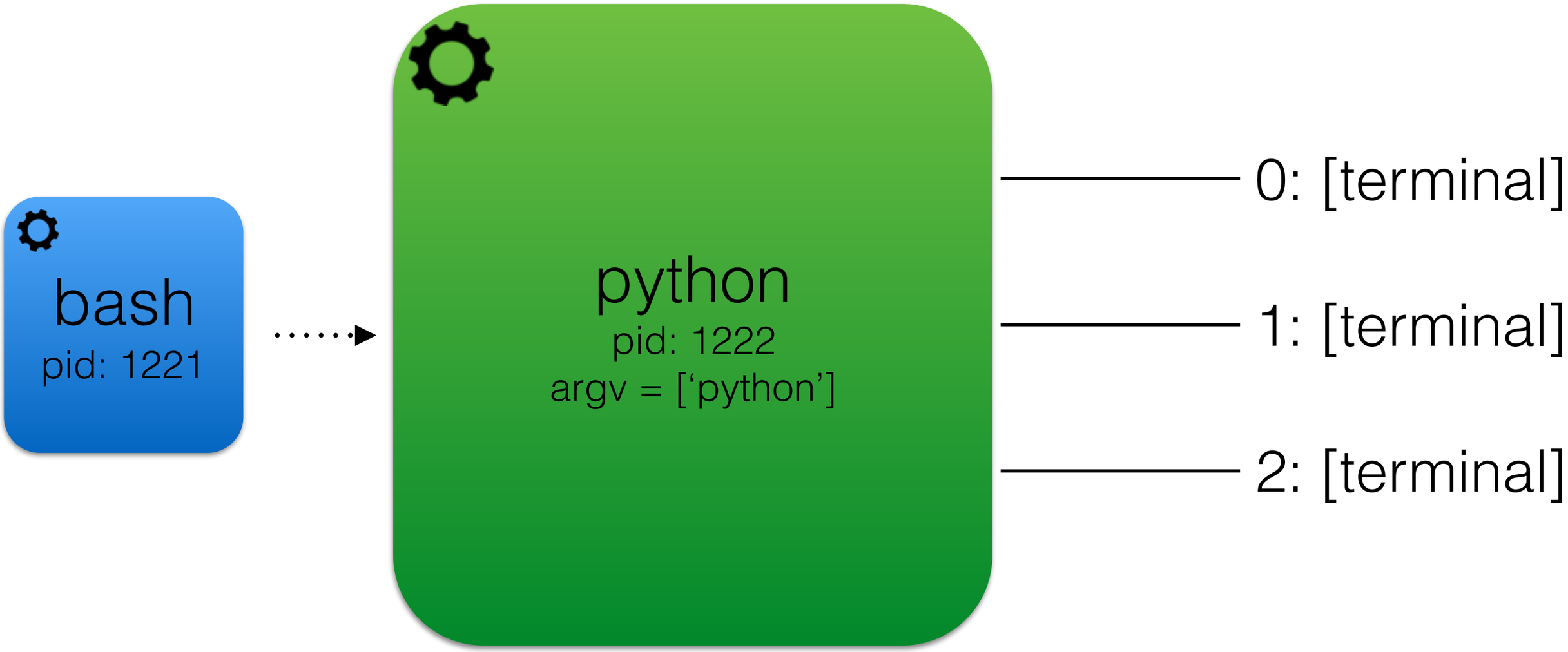
Included components (updated to latest stable release)

- How does uWSGI handle processes?
- How does uWSGI handle networking?
- Why use uWSGI?


I have this great idea for a startup!
@phildini
#djangotoad
DjangoCon.us
PHILLY
2016
REV SYS
Wharton

#typeuwsgi

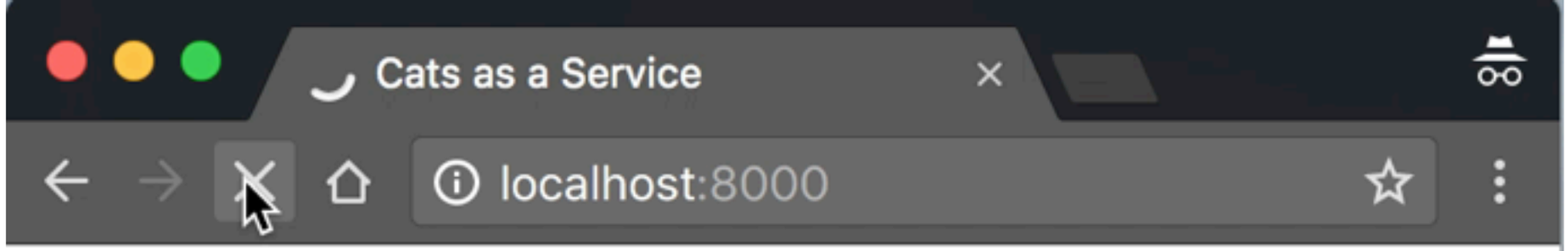
```
pythonista@conf:~ $ python
Python 3.5.2 (default, Oct 11 2016, 05:05:28)
[GCC 4.2.1 Compatible Apple LLVM 8.0.0
(clang-800.0.38)] on darwin
Type "help", "copyright", "credits" or "license"
for more information.
>>>
```


bash
pid: 1221
python
pid: 1222
argv = [‘python’]
0: [terminal]
1: [terminal]
2: [terminal]

- How does uWSGI handle processes?
- How does uWSGI handle networking?
- Why use uWSGI?

Catserve: Cats as a Service

https://github.com/phildini/catserve


Cats as a Service
localhost:8000

Processes

```
me@conf:~ $ uwsgi --master --http :8000 --module catserve.wsgi

*** Starting uWSGI 2.0.15 (64bit) on [Thu May 11 10:09:35 2017] ***

. . .

uWSGI http bound on :8000 fd 4
spawned uWSGI http 1 (pid: 1220)
uwsgi socket 0 bound to TCP address 127.0.0.1:52891
(port auto-assigned) fd 3
Python version: 3.5.2 (default, Oct 11 2016, 05:05:28)  [GCC 4.2.1
Compatible Apple LLVM 8.0.0 (clang-800.0.38)]

. . .

spawned uWSGI worker 1 (and the only) (pid: 1221, cores: 1)
```

Processes

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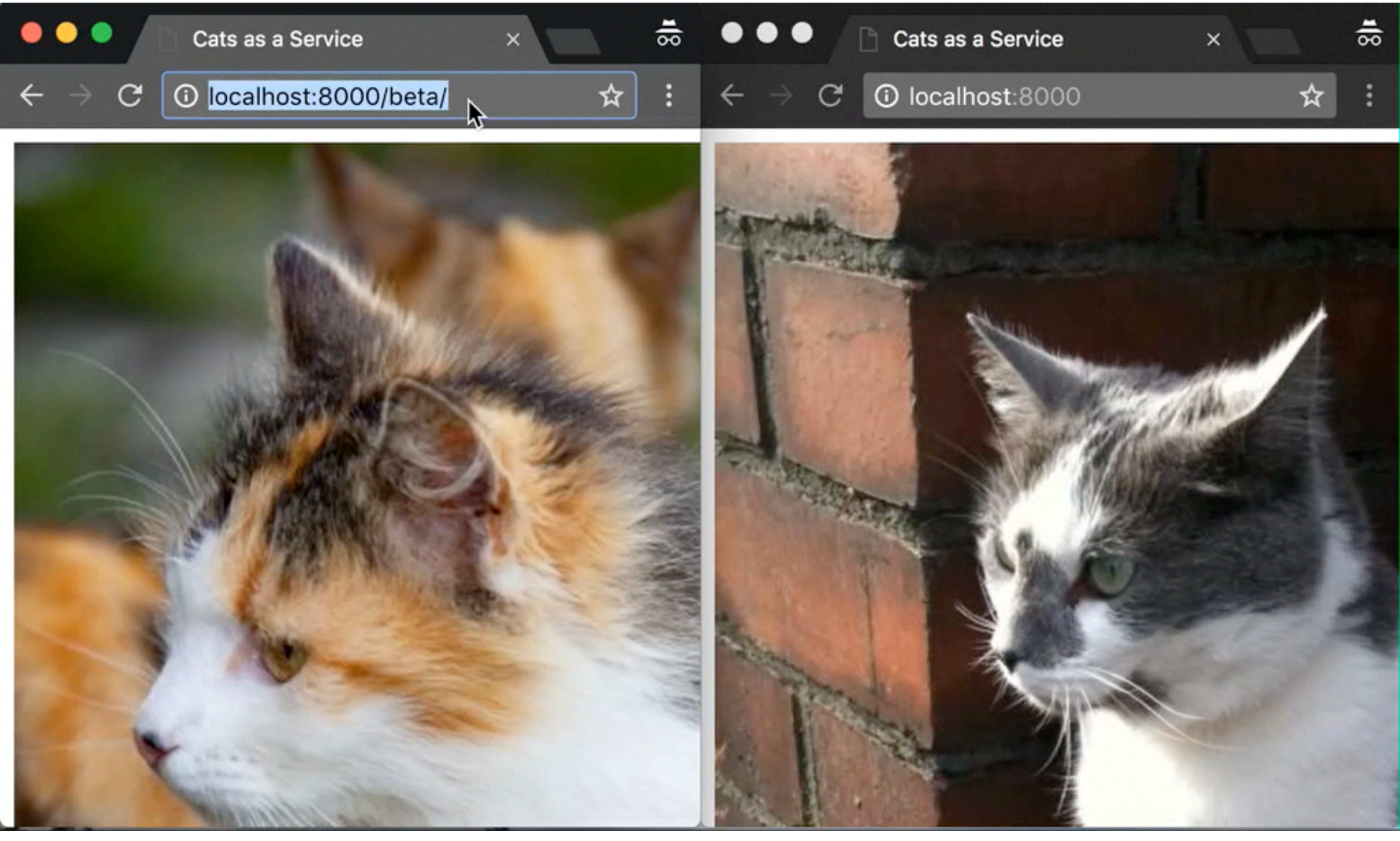
```


uwsgi
pid: 1220


Cats as a Service
localhost:8000/beta/
Cats as a Service
localhost:8000

#typeuwsgi

Processes

```
me@conf:~ $ uwsgi --master --http :8000 --module catserve.wsgi -p 2

*** Starting uWSGI 2.0.15 (64bit) on [Thu May 11 10:09:35 2017] ***

. . .

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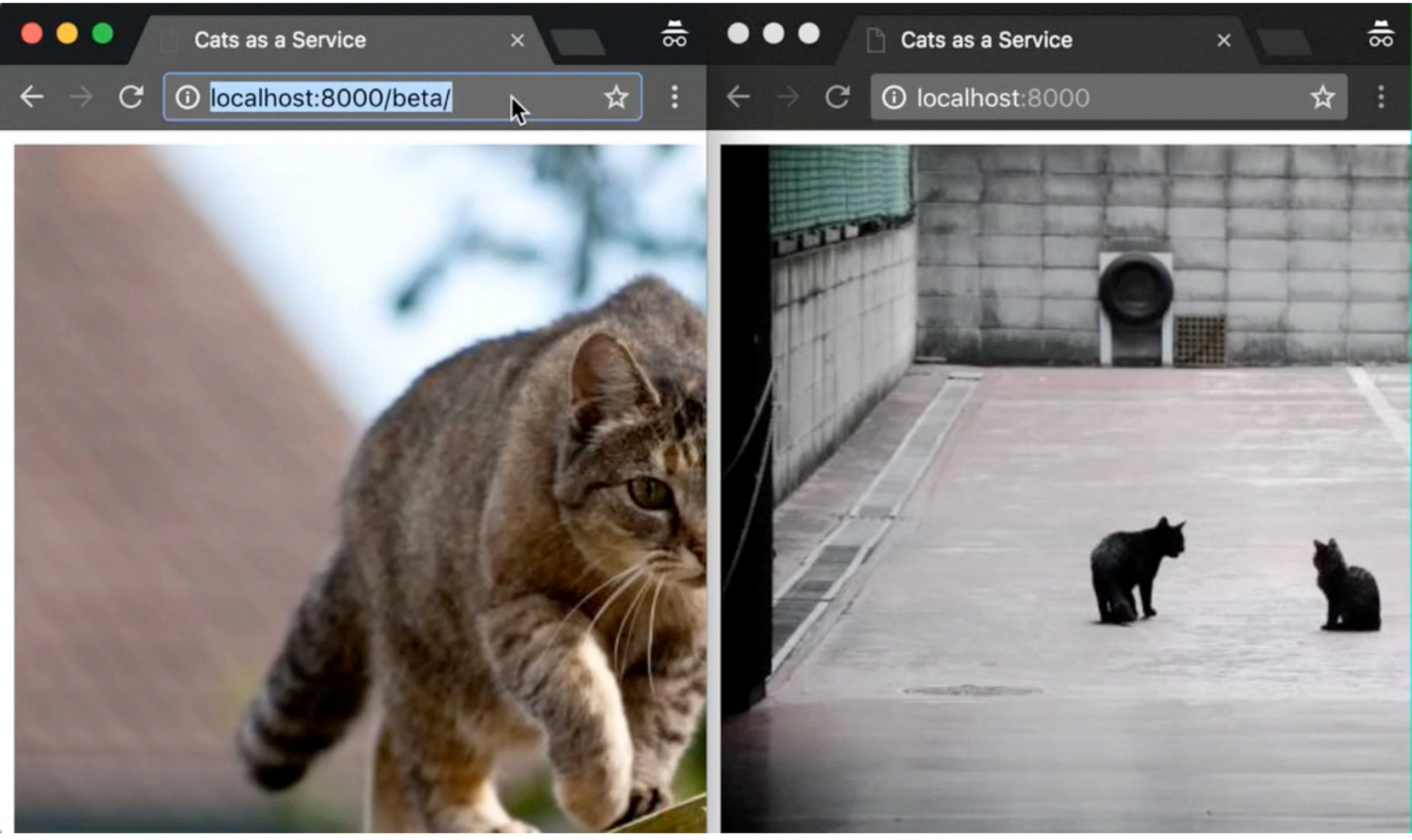
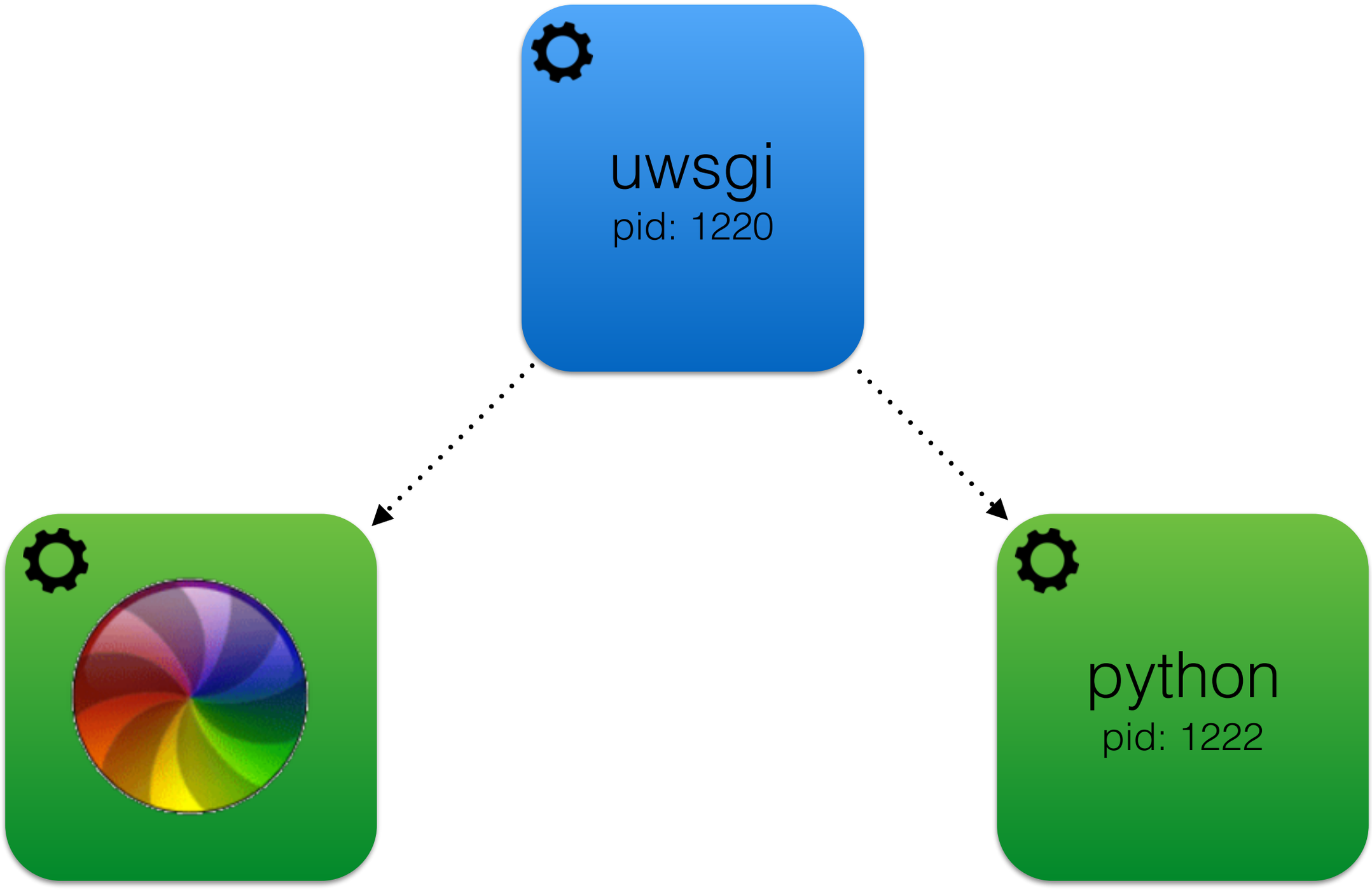
spawned uWSGI http 1 (pid: 1220)
uwsgi socket 0 bound to TCP address 127.0.0.1:52891
(port auto-assigned) fd 3
Python version: 3.5.2 (default, Oct 11 2016, 05:05:28)  [GCC 4.2.1
Compatible Apple LLVM 8.0.0 (clang-800.0.38)]

. . .

spawned uWSGI worker 1 (pid: 1221, cores: 1)
spawned uWSGI worker 2 (pid: 1222, cores: 1)
```


Cats as a Service
localhost:8000/beta/
Cats as a Service
localhost:8000

#typeuwsgi


uwsgi
pid: 1220
python
pid: 1222

- How does uWSGI handle processes?
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Networking

```
me@conf:~ $ uwsgi --master --http :8000 --module catserve.wsgi -p 2

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. . .

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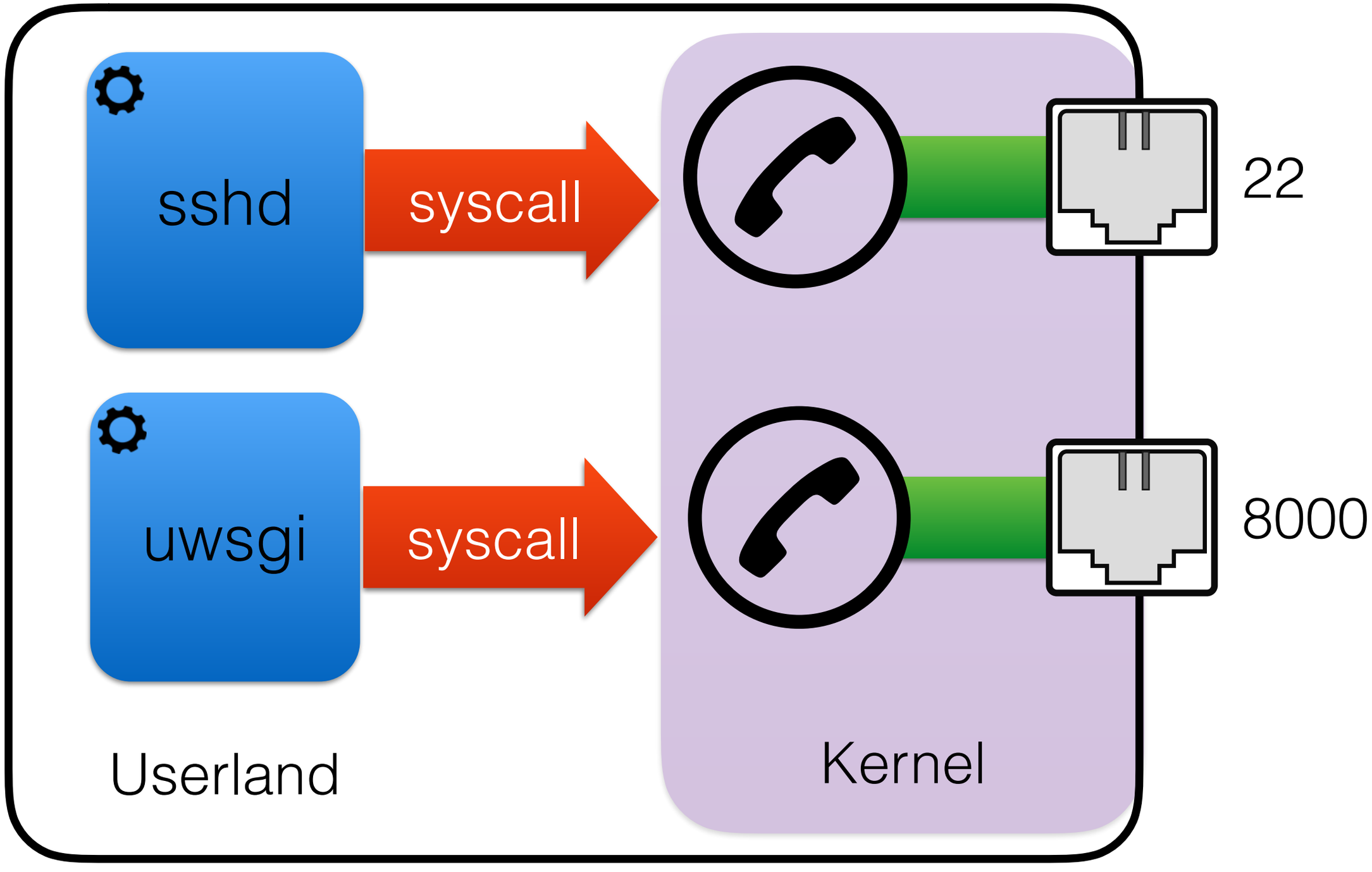
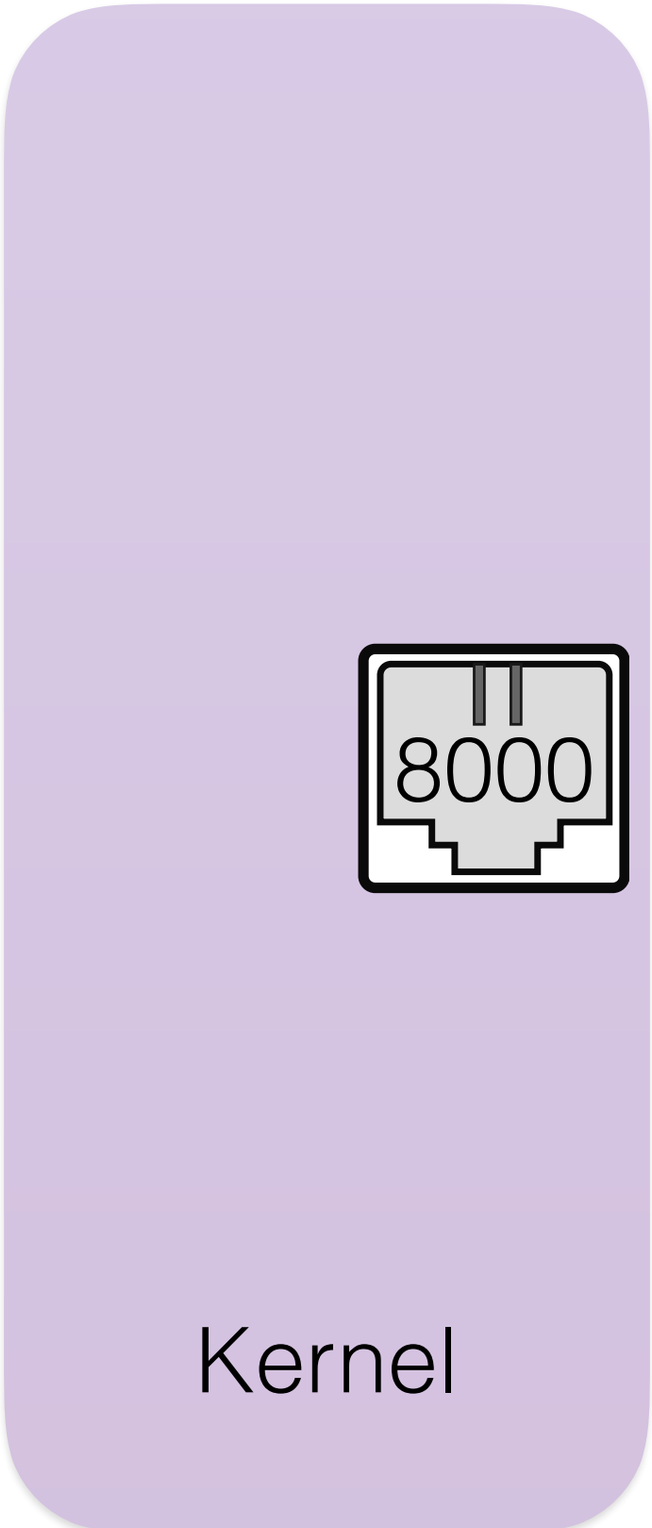
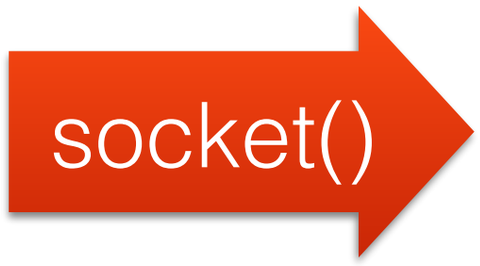
```

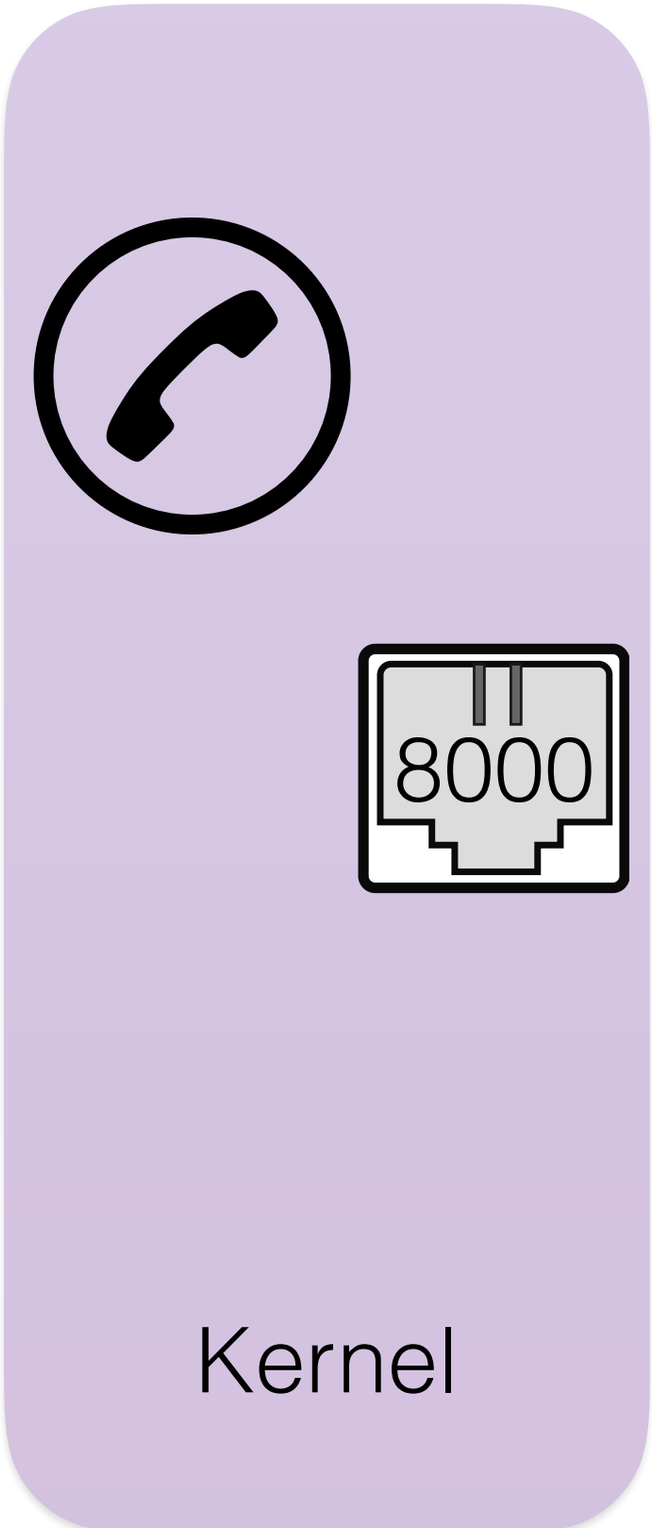

sshd
syscall
22
uwsgi
syscall
8000
Userland
Kernel

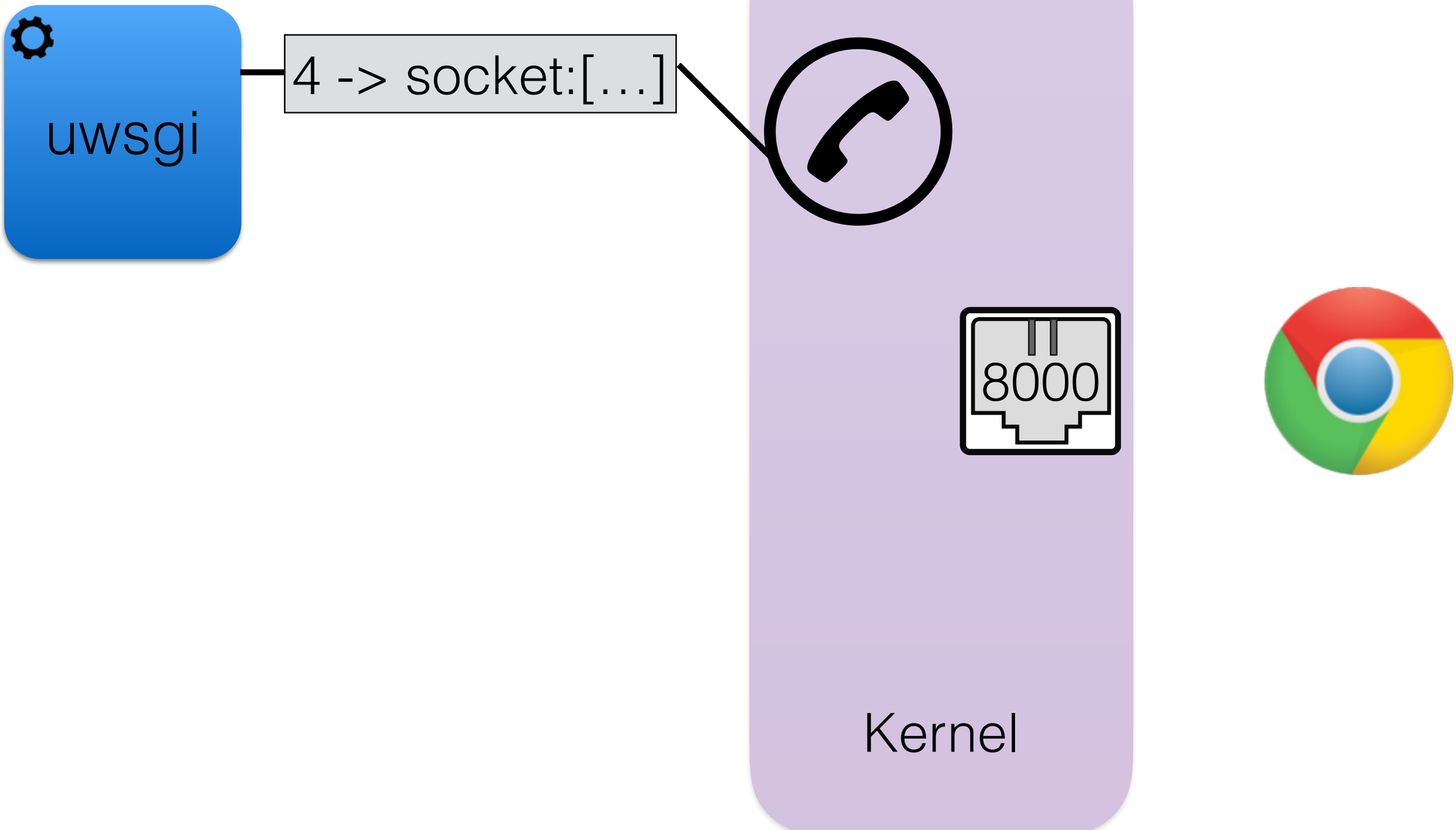

uwsgi

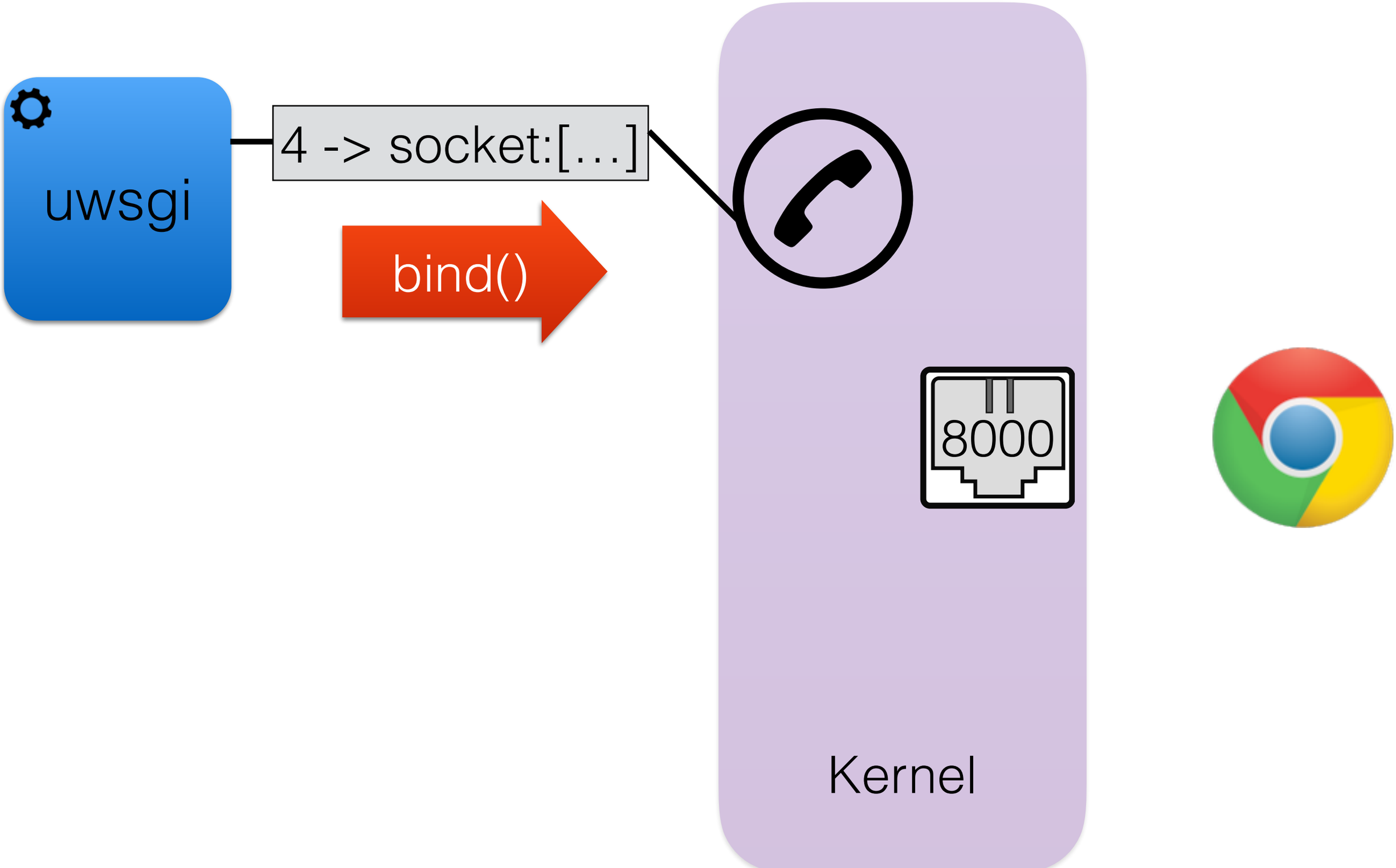

8000
Kernel

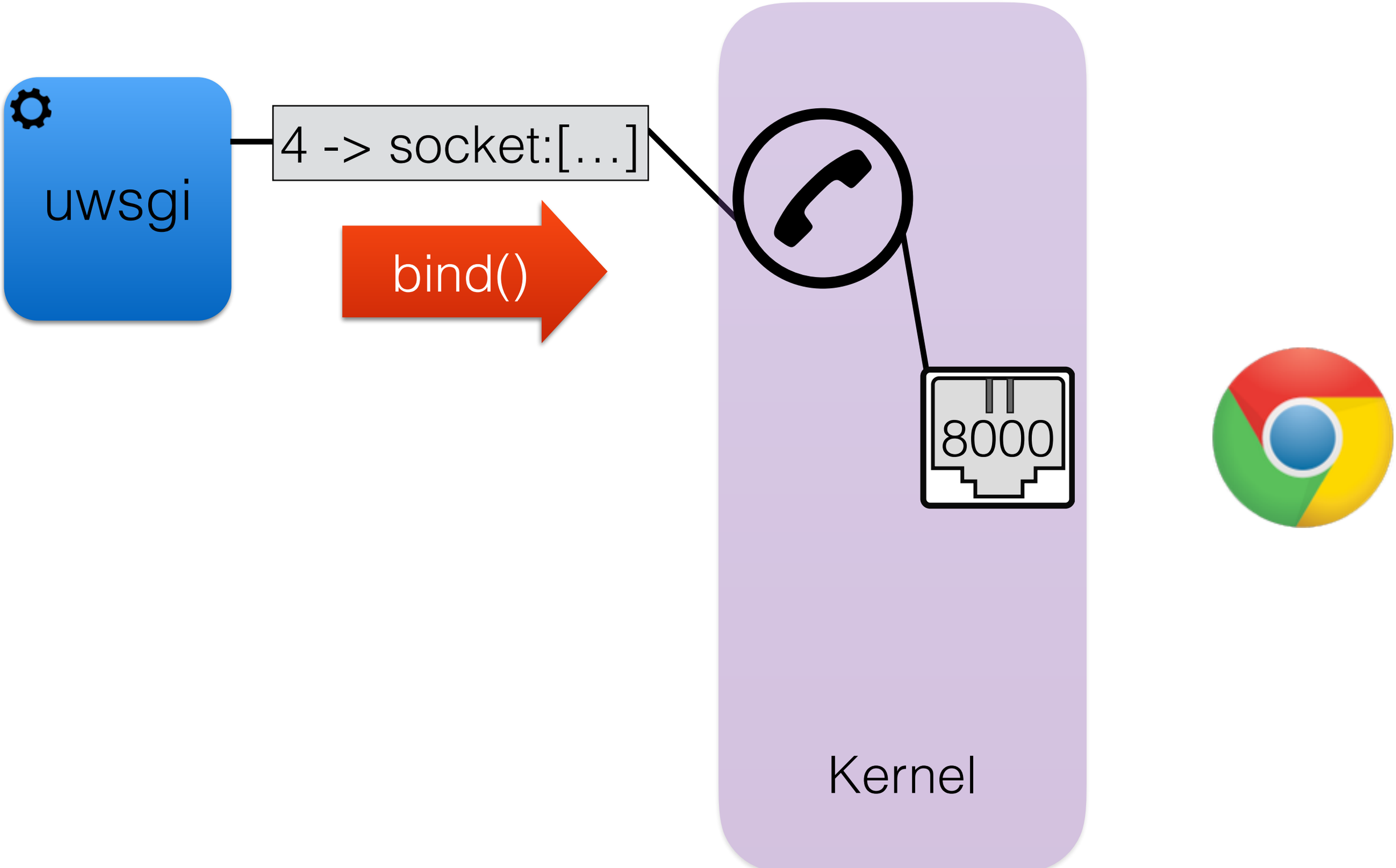

uwsgi

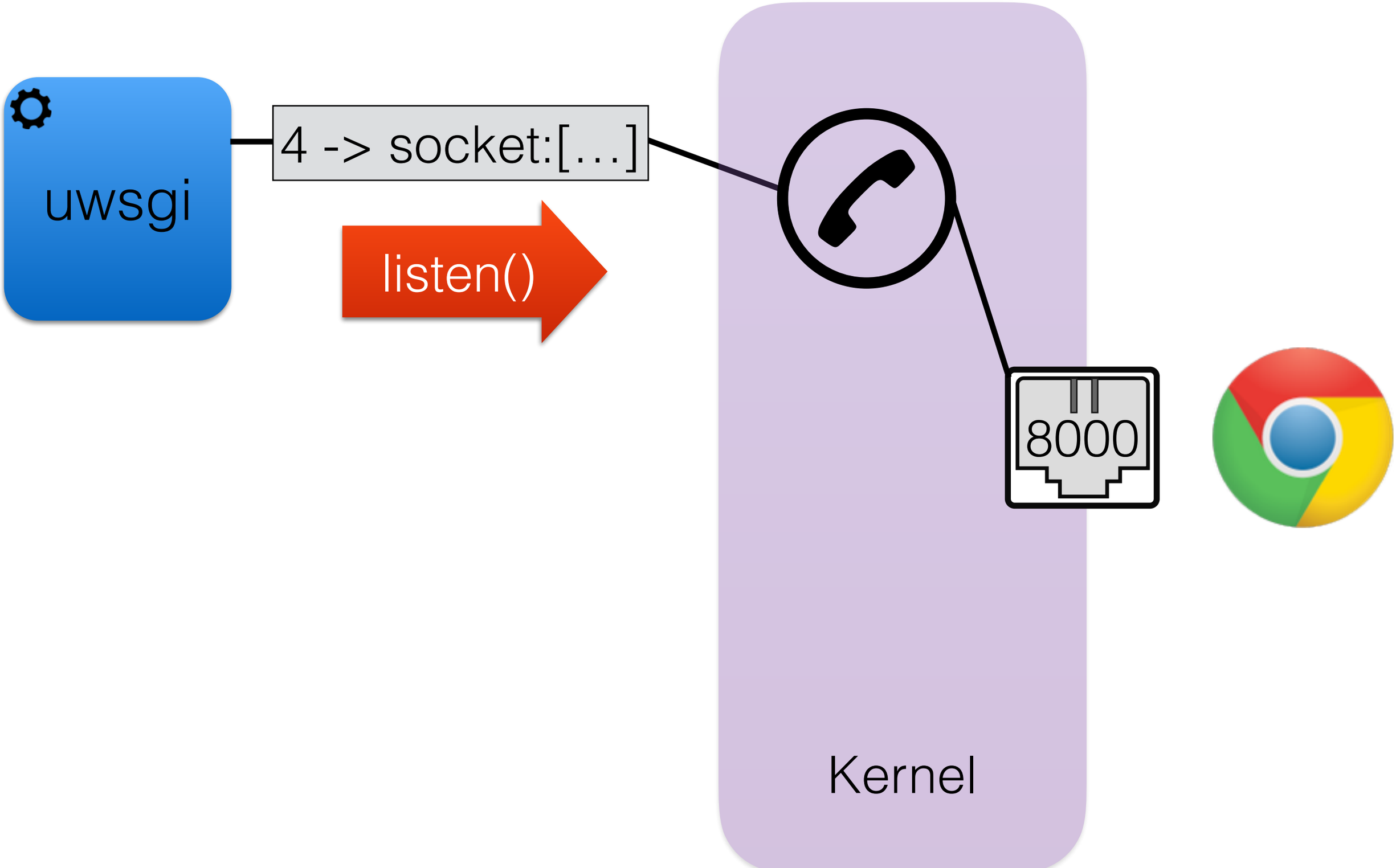

socket()

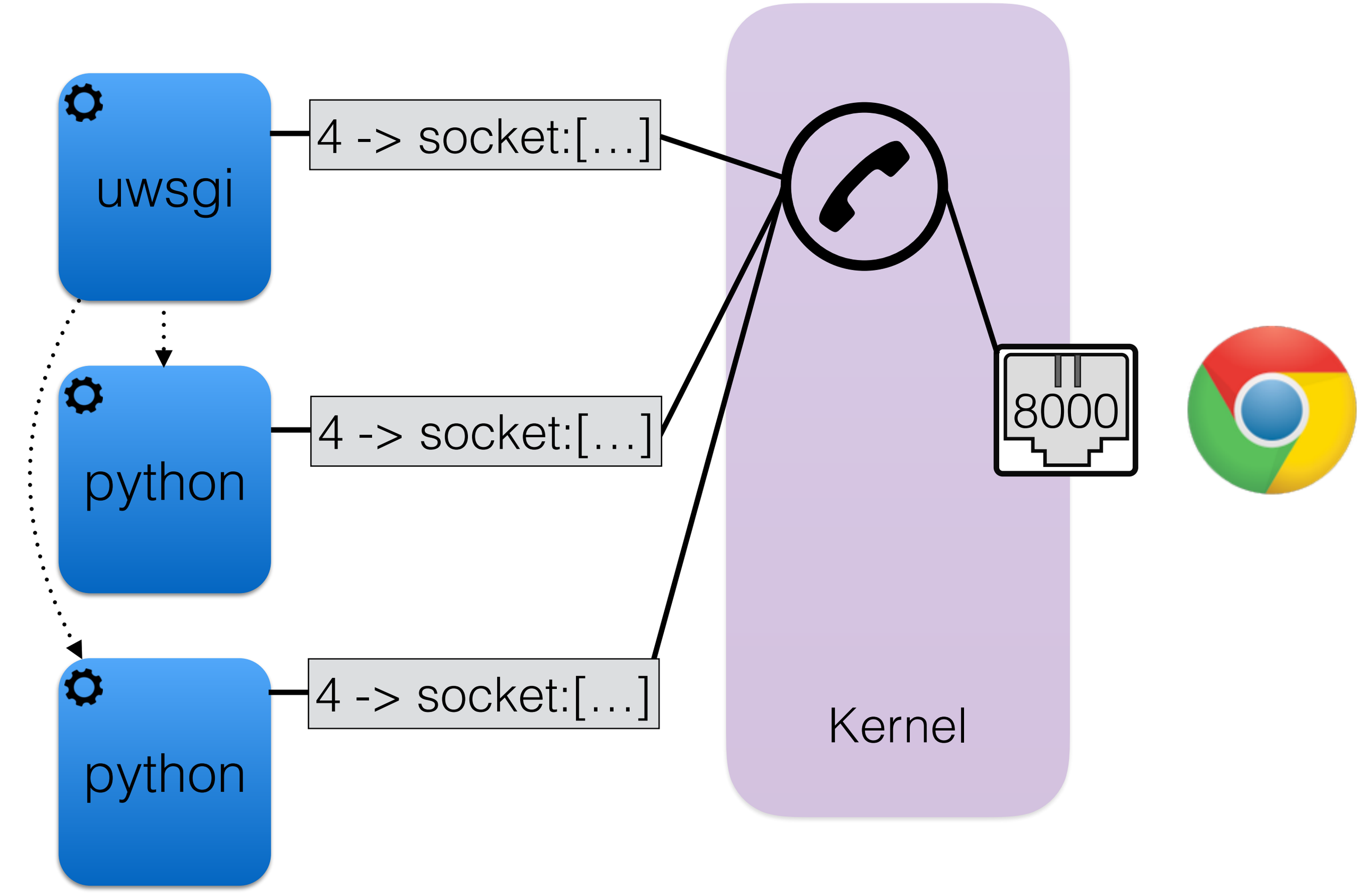

8000
Kernel


uwsgi
4 -> socket:[...]
8000
Kernel

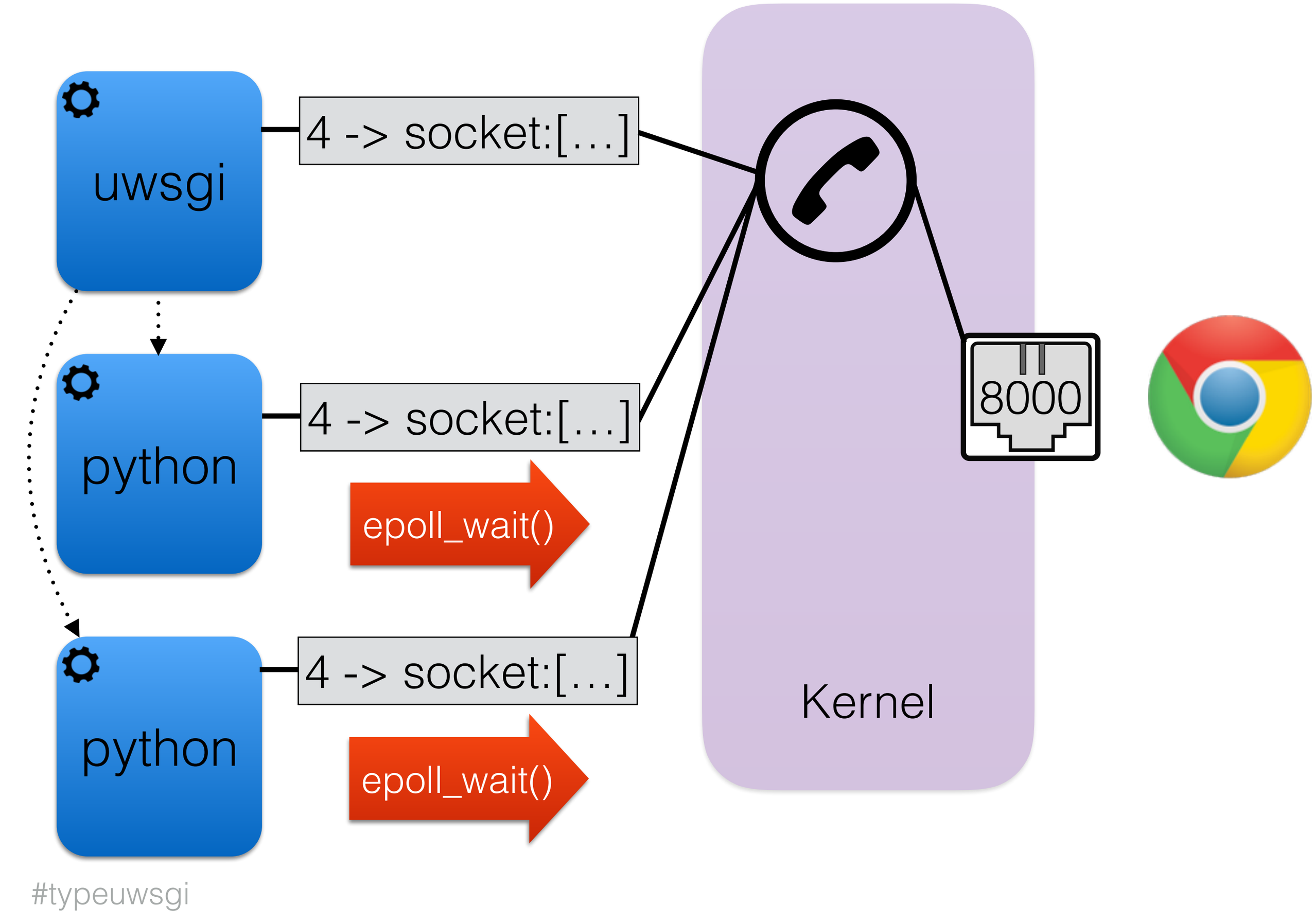

uwsgi
4 -> socket:[...]
bind()
8000
Kernel


uwsgi
4 -> socket:[...]
bind()
8000
Kernel


uwsgi
4 -> socket:[...]
listen()
8000
Kernel



#typeuwsgi


uwsgi
4 -> socket:[…]
python
4 -> socket:[…]
epoll_wait()
python
4 -> socket:[…]
epoll_wait()
8000
Kernel

#typeuwsgi

uwsgi

4 -> socket:[…]

python

4 -> socket:[…]

epoll_wait()

4 -> socket:[…]

5 -> […]

accept()

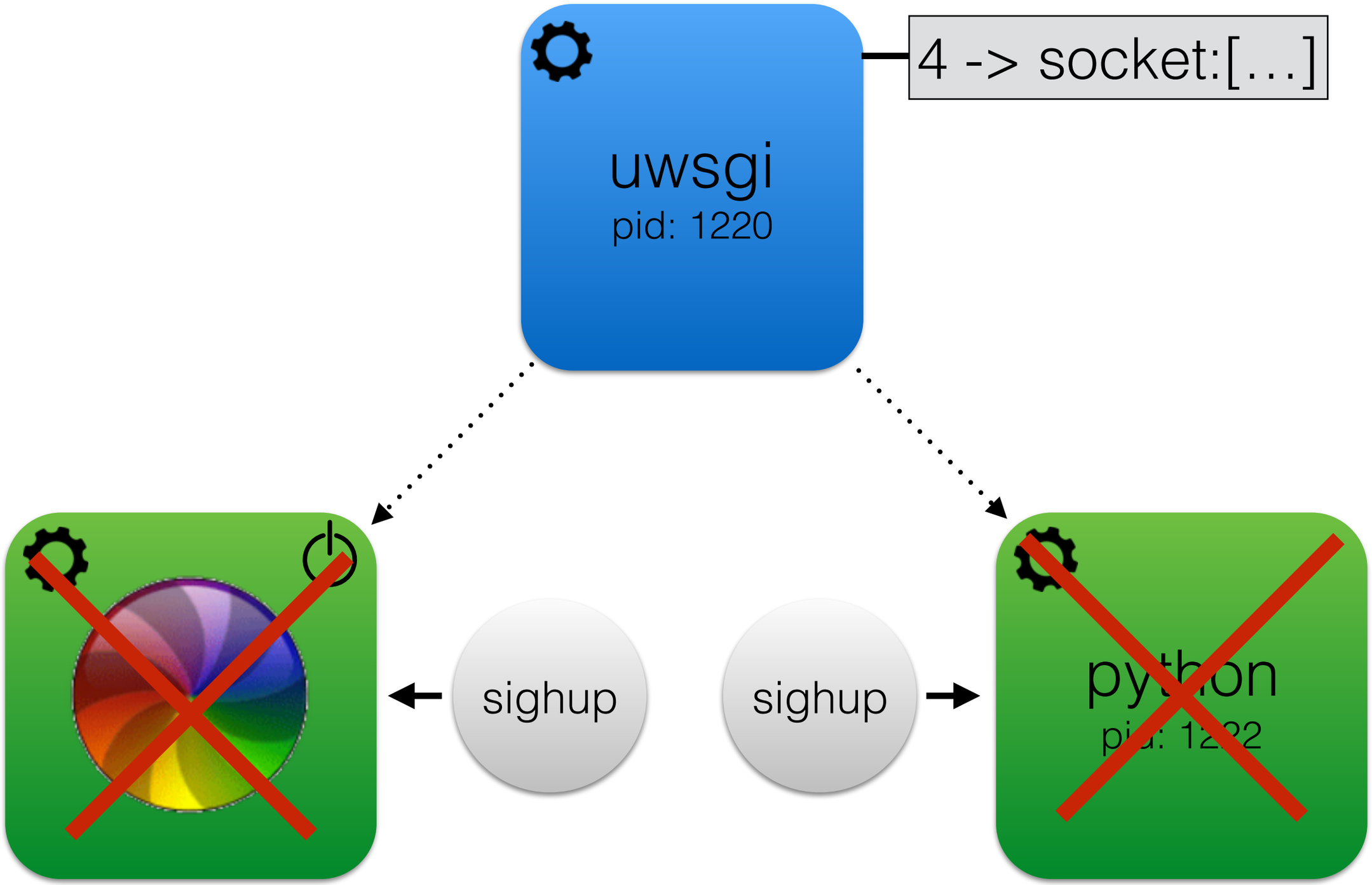
Kernel

8000

#typeuwsgi

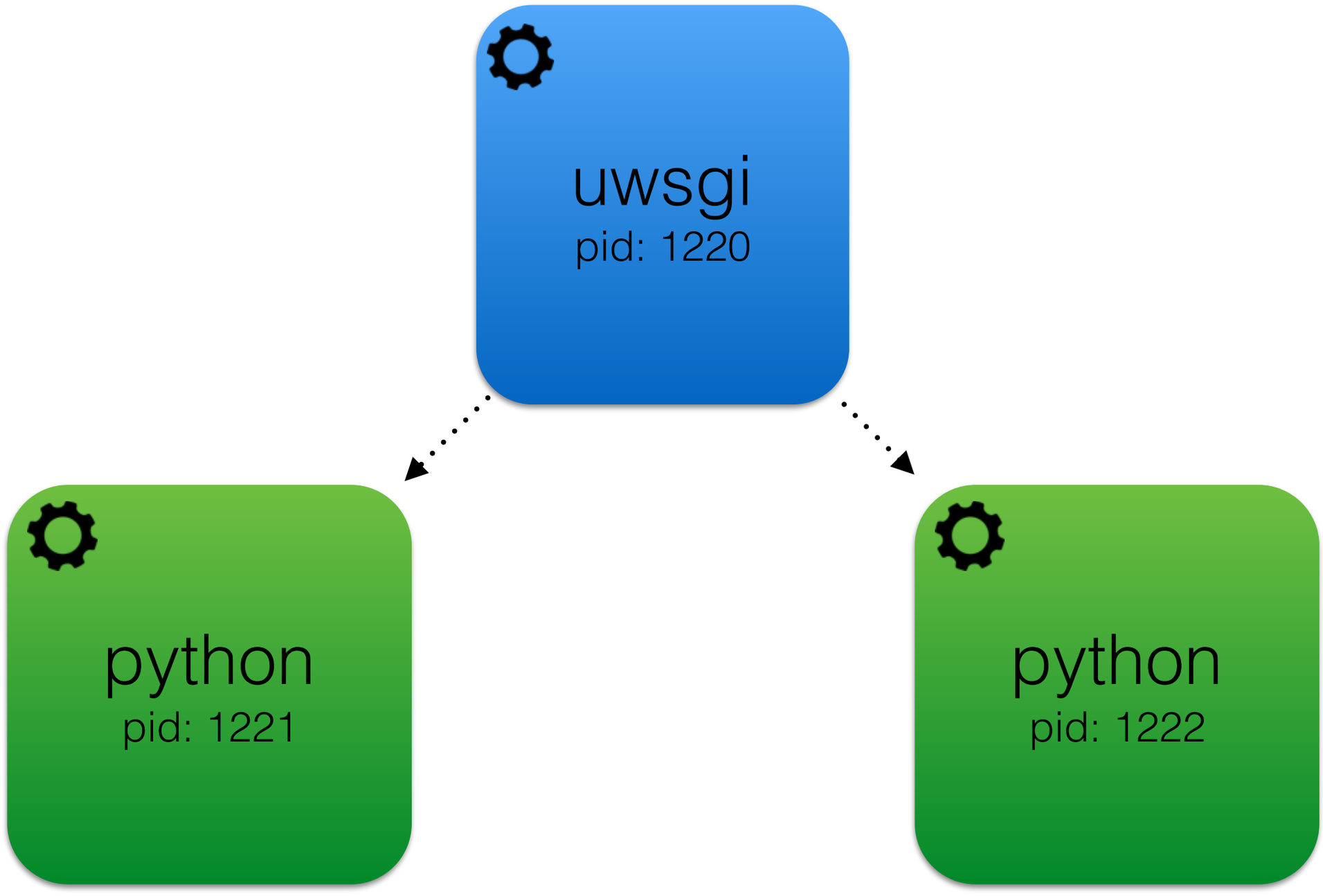
- How does uWSGI handle processes?
- How does uWSGI handle networking?
- Why use uWSGI?

Code Reloading



Tunability

```
me@conf:~ $ uwsgi --master --http :8000 --module catserve.wsgi -p 2
```



Security

```
GET / HTTP/1.1
Host: catserve.io
```

```
GET / HTTP/1.1
Host: catserve.io
Host: catserve.biz
```

"[runserver] has not gone through security audits…
and that's how it's gonna stay."

Config Files

```
me@conf:~ $ uwsgi --master --http :8000 --module catserve.wsgi -p 2
```

```
[uwsgi]
master = 1
http = 8000
module = catserve.wsgi
processes = 2
```

Features

- Static file serving
- Max requests per worker
- Queuing systems
- HTTPS support, HTTP2 support
- Harakiri
- uwsgitop
- memory-report
- async

Why uWSGI?

- Code Reloading
- Tunability
- Security
- Config Files
- Features

Thanks!
@unbit

Questions?

- How does uWSGI handle processes?
- How does uWSGI handle networking?
- Why use uWSGI?

Philip
James

phildini@phildini.net

@phildini

Consulting!