

FreeSWITCH-driven routing in OpenSIPS

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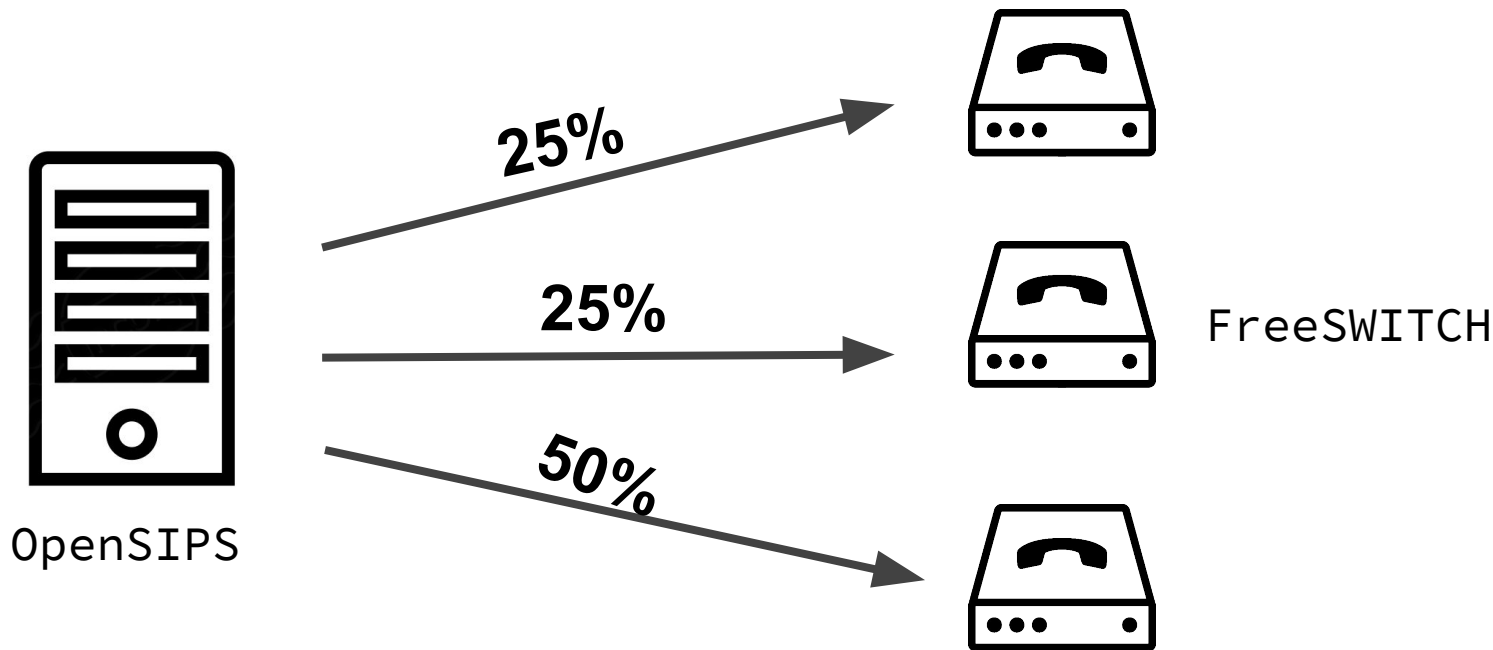
-
- introduction
 - limitations
 - solutions
 - FreeSWITCH ESL
 - dispatcher + load_balancer

Introduction



callcentrehelper.com

Stateless routing



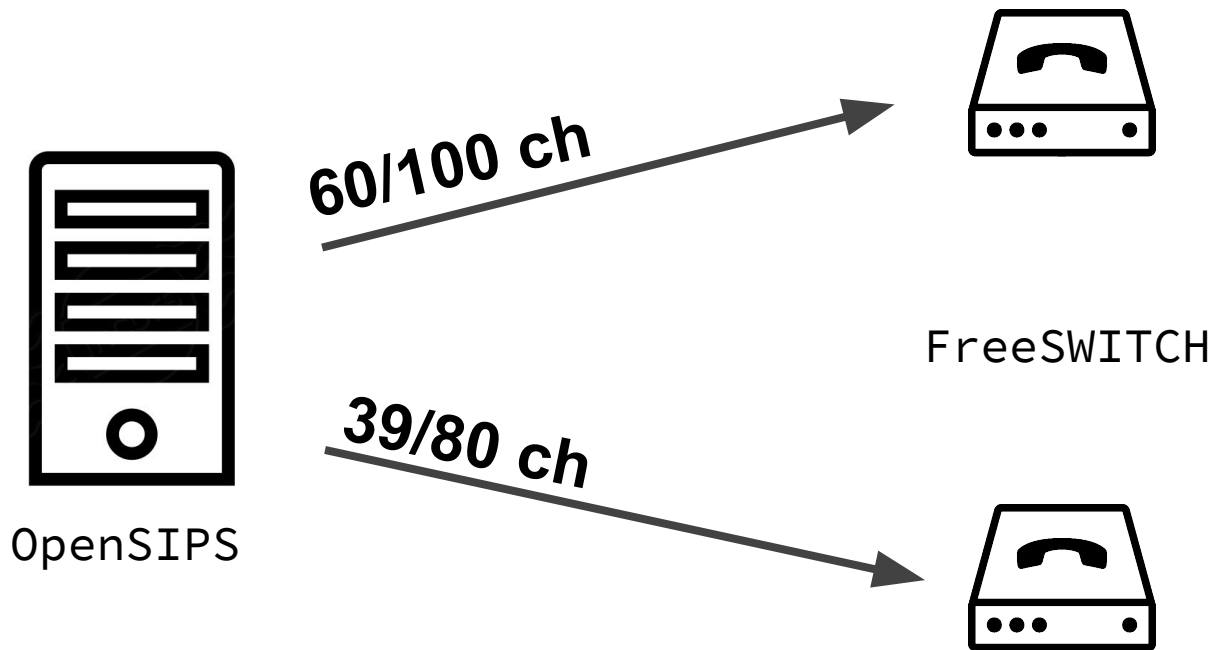
Pros

- fast
- easy to set up
- unlimited channels

Cons

- uneven call distribution
- uneven resource distribution

Stateful routing



- channel aware
- even call distribution
- extra provisioning

Limitation

SIP

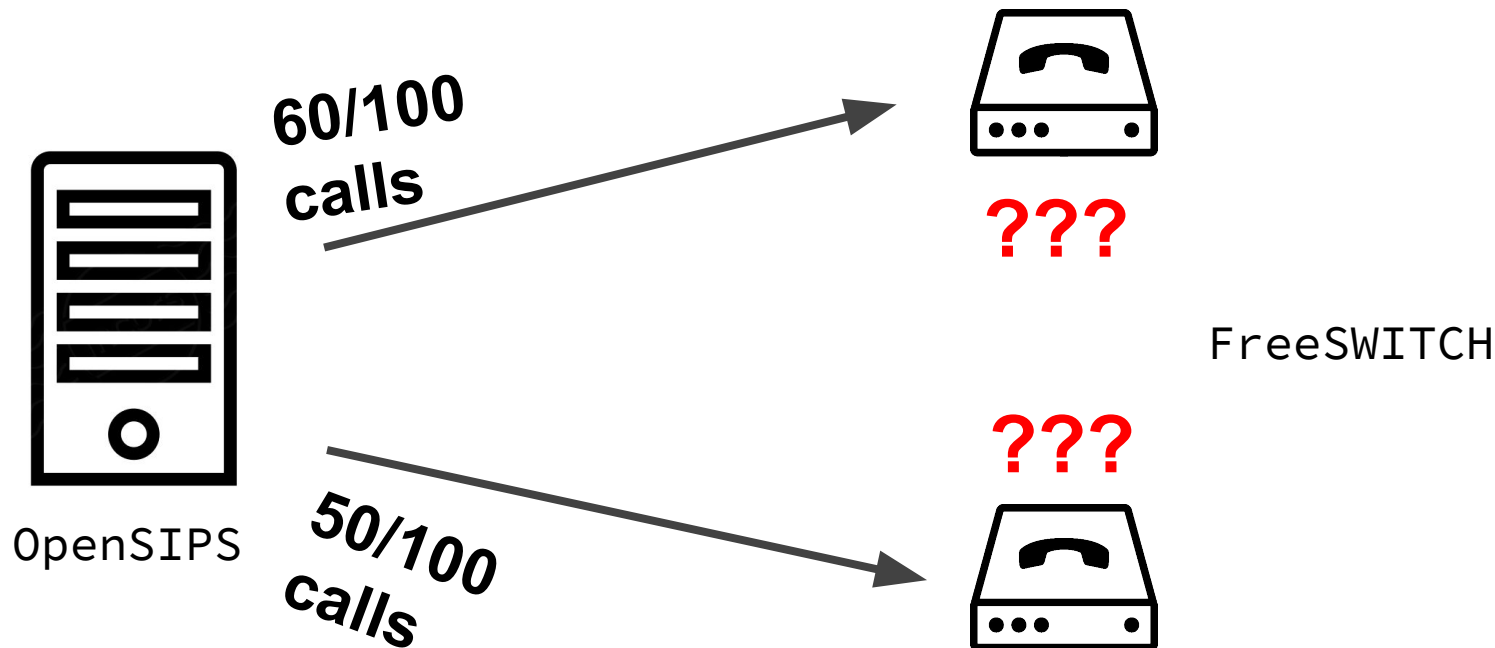
Websocket

“All load balancers are the same!”

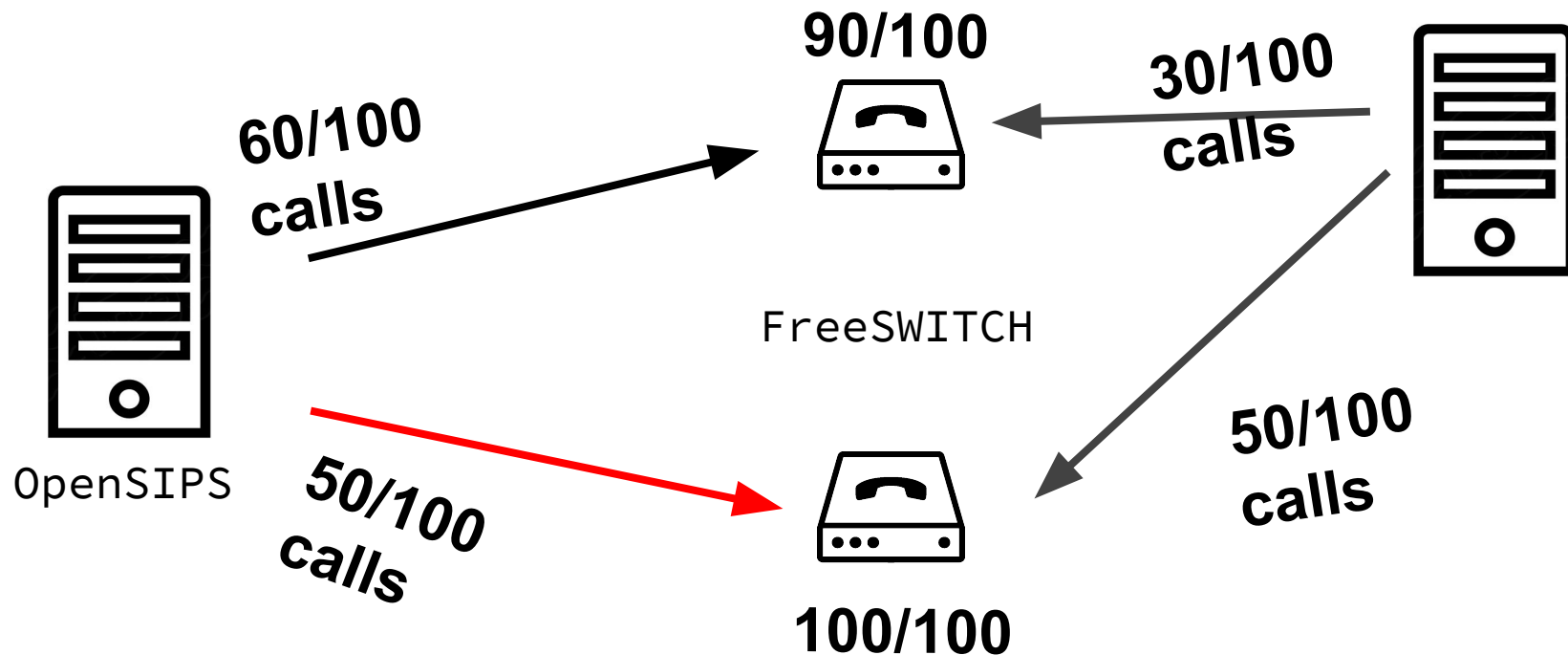
HTTP

DNS

Limitations

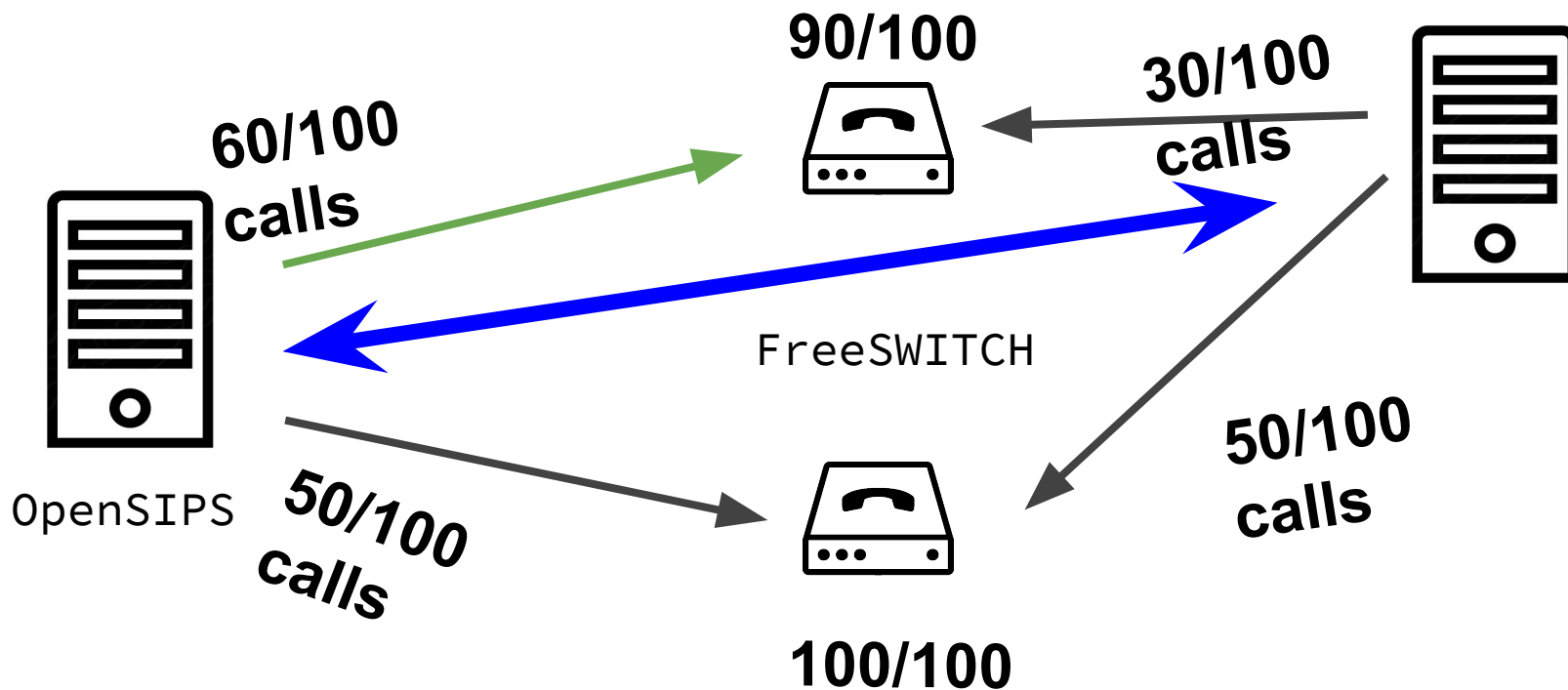


Limitations



Solutions

Solution #1



Solution #1:

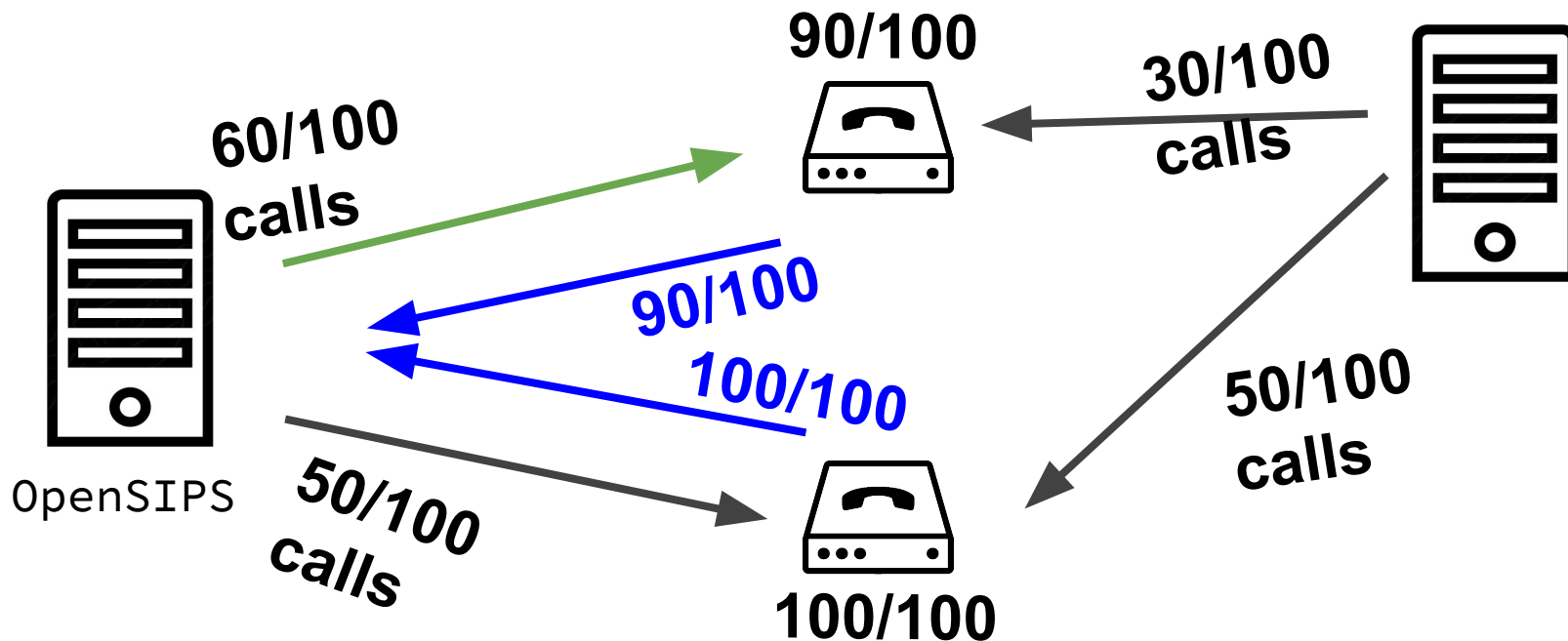


full awareness between all SIP endpoints

Cons:

- incompatibilities between softswitches
- complicates platform scaling

Solution #2



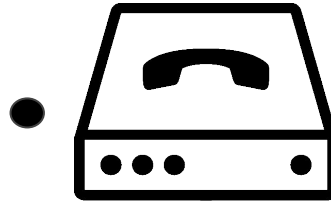
awareness & communication with the backend layer

Pros:

- one-time provisioning per backend node
- allows platform to grow easily

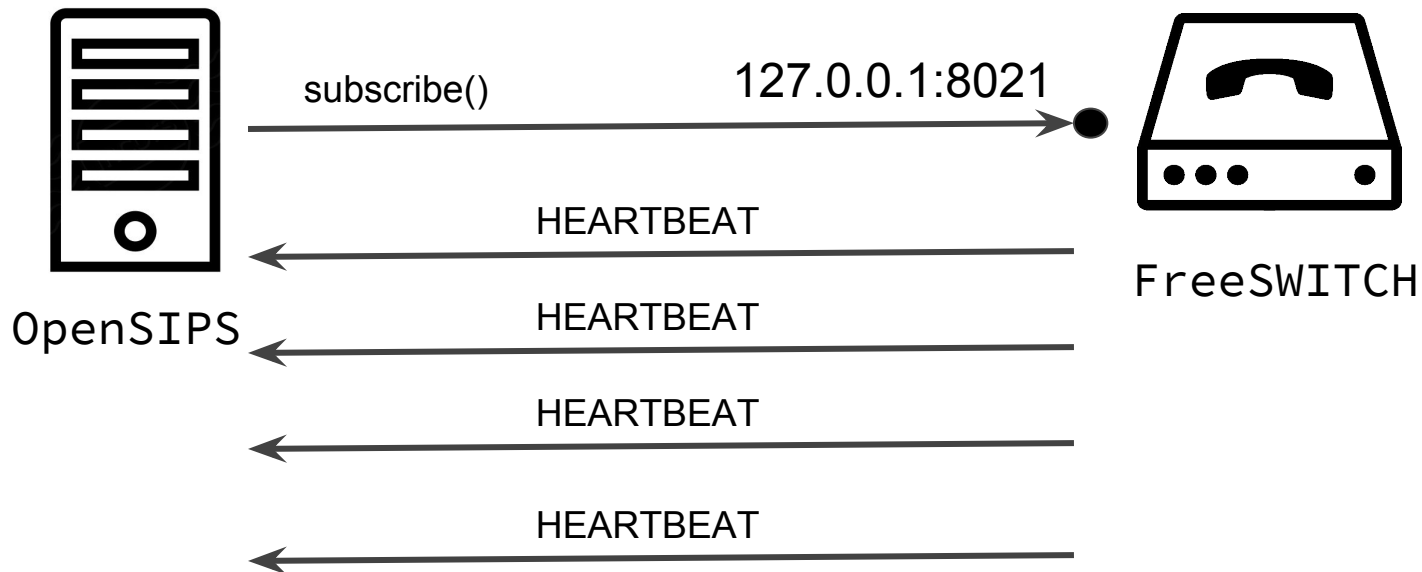
The FreeSWITCH ESL

127.0.0.1:8021



FreeSWITCH

ESL Heartbeats

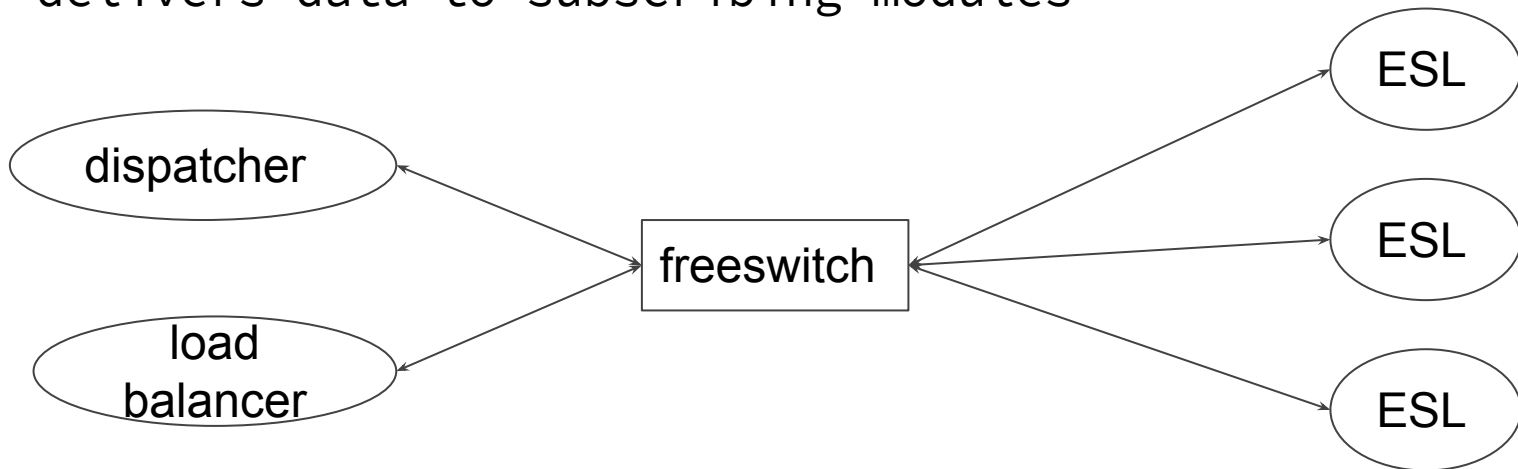


```
{  
  ...  
  "Event-Date-GMT": "Mon, 30 Jan 2017 14:44:00 GMT",  
  "Event-Name": "HEARTBEAT",  
  "FreeSWITCH-Hostname": "pbx2",  
  "FreeSWITCH-IPv4": "172.17.0.3",  
  "Idle-CPU": "78.400000",  
  "Max-Sessions": "1000",  
  "Session-Count": "0",  
  ...  
}
```

the “freeswitch” OpenSIPS module



- starting with OpenSIPS 2.3
- driver for the FS ESL
- delivers data to subscribing modules



dispatcher

The OpenSIPS “dispatcher”



- Stateless balancing
- High traffic volume
- Unconstrained routing

- random
- weighted round-robin
- hashing (Call-ID, From, To, R-URI)

“If you require dumb load balancing,
dispatcher is the smartest module that can do it”

Dispatcher: enable FreeSWITCH stats



```
loadmodule "freeswitch.so"
```

```
modparam("dispatcher", "fetch_freeswitch_stats", 1)
```

Dispatcher: provisioning



```
mysql> SELECT * FROM dispatcher;
```

id	setid	destination	weight	priority
1	1	sip:192.168.1.38	fs://:ClueCon@192.168.1.38	0
2	1	sip:192.168.1.39	fs://:ClueCon@192.168.1.39	0
2	2	sip:192.168.1.50	10	0
2	2	sip:192.168.1.51	10	0

fs://:ClueCon@192.168.1.38

Better platform throughput

- less retransmissions
- less re-tries

Better service quality

- lower PDD

load_balancer

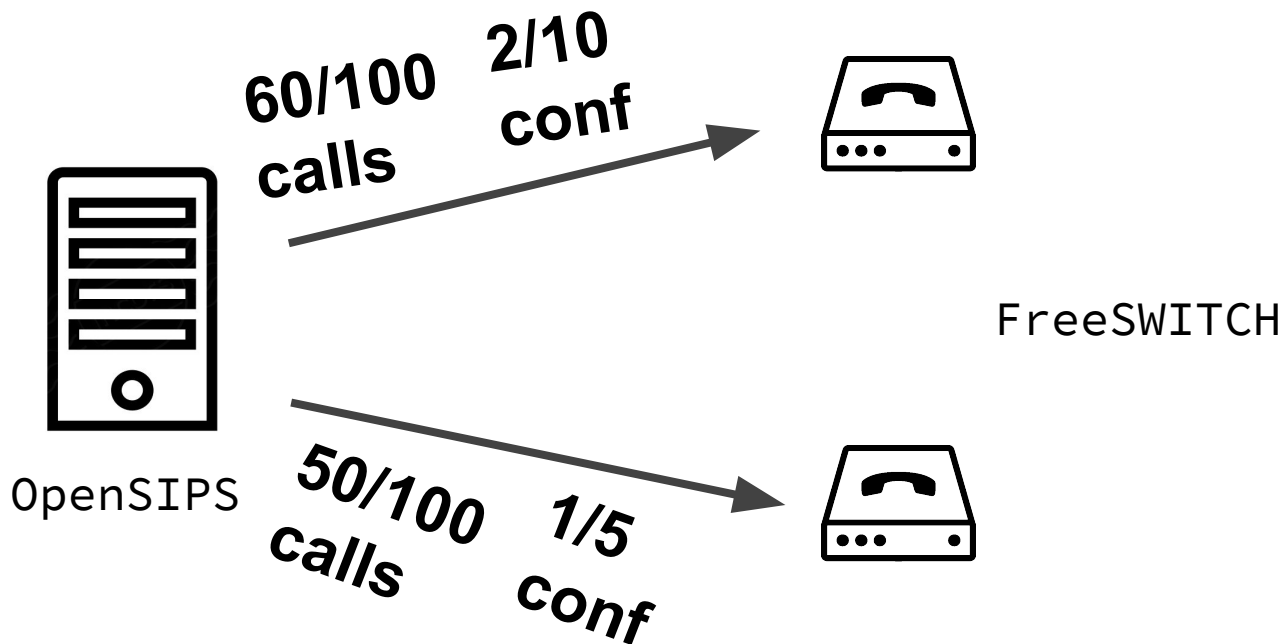
The OpenSIPS “load_balancer”



- Stateful balancing
- High traffic volume
- Easily manage overlapping, limited resources

channels / video-conf / audio-conf / etc.

Load_balancer operation



Load_balancer: enable FreeSWITCH stats



```
loadmodule "freeswitch.so"
```

```
modparam("load_balancer", "fetch_freeswitch_stats", 1)
```

Load_balancer: provisioning



```
mysql> SELECT * FROM opensips.load_balancer;
```

id	group_id	dst_uri	resources
1	1	sip:10.0.0.237	ch=fs://:ClueCon@10.0.0.237;conf=10
2	1	sip:10.0.0.238	ch=fs://:ClueCon@10.0.0.238;chan=75
3	1	sip:10.0.0.239	ch=fs://:ClueCon@10.0.0.239

ch=fs://:ClueCon@10.0.0.237;conf=10

Better system throughput

- less retransmissions
- less re-tries

Better service quality

- lower PDD

Deployment Tips

OpenSIPS: Library dependencies



- no additional library dependencies
- plug and play

ESL port 8021, TCP


```
autoload_configs/switch.conf.xml
```

- **max-sessions = 1000 !**
- event-heartbeat-interval

`autoload_configs/event_socket.conf.xml`

- `listen-ip`
- `password`
- `apply-inbound-acl`

https://freeswitch.org/confluence/display/FREESWITCH/mod_event_socket

Freeswitch module doc:

<http://www.opensips.org/html/docs/modules/2.4.x/freeswitch.html>

dispatcher / load_balancer docs:

<http://www.opensips.org/html/docs/modules/2.4.x/dispatcher.html>

http://www.opensips.org/html/docs/modules/2.4.x/load_balancer.html

Tutorial:

<https://blog.opensips.org/2017/03/01/freeswitch-driven-routing-in-opensips-2-3/>

Future developments



- Asterisk ARI
- others?

Take-Away Message

FreeSWITCH-driven balancing is easy to enable,
and will improve service quality

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