



Interactive Development in the Age of Kubernetes

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Ridge Cloud

Ridge is a massively distributed cloud.
Powered by a global data centers & CSP
network, Ridge provides developers a public
cloud experience at the edge.

- | | | |
|--------------|--------------|--------------|
| Porto Alegre | Hong Kong | Jaipur |
| Hamilton | Amsterdam | Ludhiana |
| Porirua | Singapore | Mumbai |
| Wellington | London | Mumbai |
| Sydney | San Jose | Sydney |
| Toronto | Dallas | Frankfurt |
| Toronto | New Jersey | Tokyo |
| Vancouver | Chicago | Amsterdam |
| Frankfurt | New York | |
| Frankfurt | Lagos | |
| Singapore | Abuja | |
| Slough | Karlskrona | |
| Reading | Haifa | |
| Seattle | Zagreb | |
| Sterling | Sydney | |
| Sterling | Melbourne | |
| Santa Clara | Toronto | |
| Secaucus | Hong Kong | |
| Chicago | Frankfurt | |
| Frankfurt | Amsterdam | |
| Stockholm | Hamilton | |
| London | Serangoon | Ashburn |
| Buffalo | Johannesburg | Dallas |
| Petah Tikva | London | Parsippany |
| Bogor Jawa | Ashburn | Chicago |
| Barat | Santa Clara | Los Angeles |
| Mumbai | Bangalore | Sunnyvale |
| Nashik | Bangalore | Toronto |
| Brasov | Ahmedabad | Johannesburg |
| Bucharest | Faridabad | Cape Town |
| Montreal | Ghaziabad | Hong Kong |

81+

EDGE LOCATIONS
ONE CLOUD
ONE API

Select Edge Data Center Partners



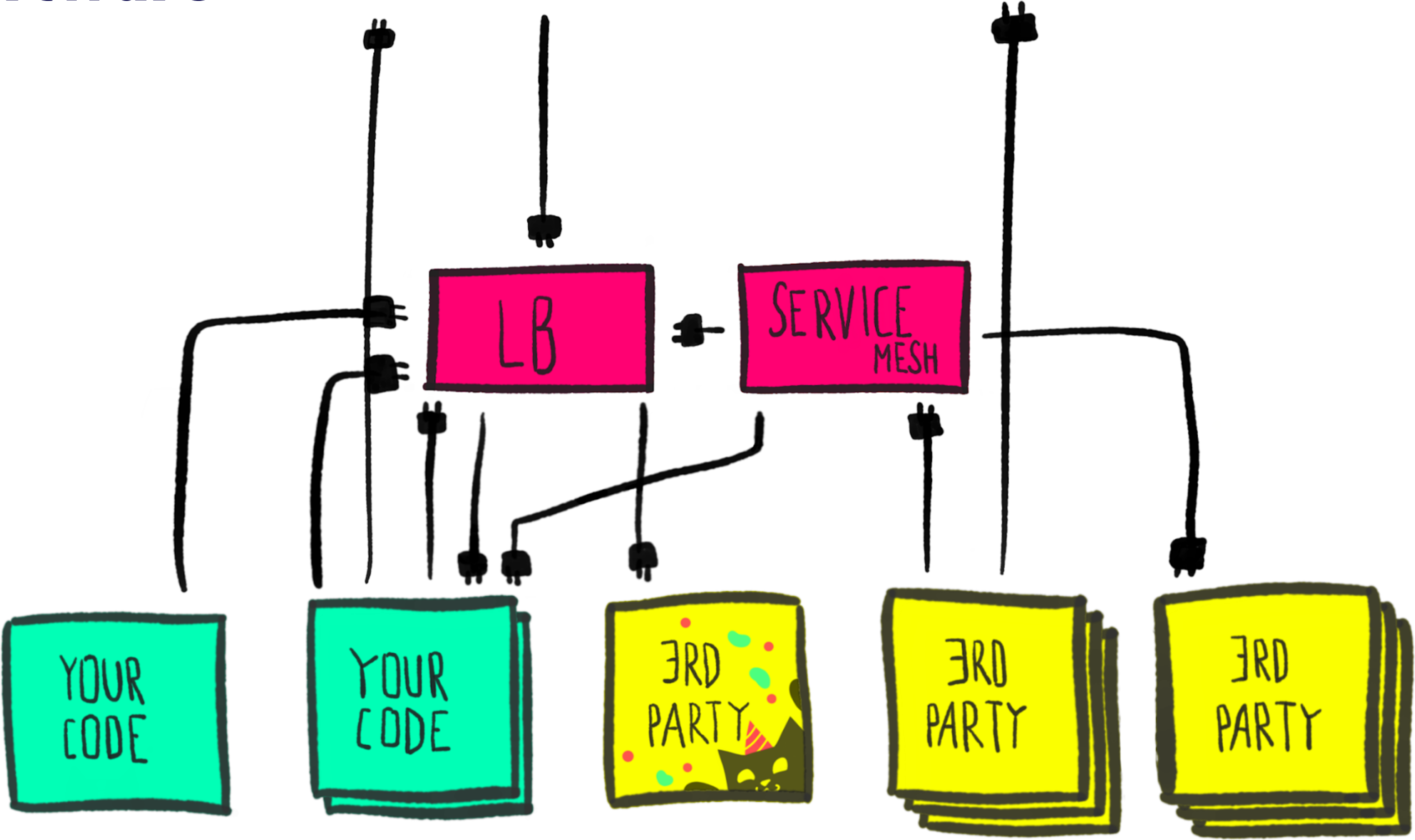
Interactive development, 80s style



```
ПК8000 BASIC 1987 версия 1.2
46873 Bytes free
Ok
10 PRINT "Hello wolrd!"
20 END
RUN
Hello wolrd!
Ok
10 PRINT "Hello world!"
RUN
Hello world!
Ok
█
```

color auto goto list run

Modern software



Ridge experience: development tools & problems

- Minikube et al
- Development clusters in cloud
- In-container debugging
- Slow edit-run-test loop
- Hard to start afresh
- Hard to debug
- Hard to manipulate state

Running distributed applications locally



Ideal

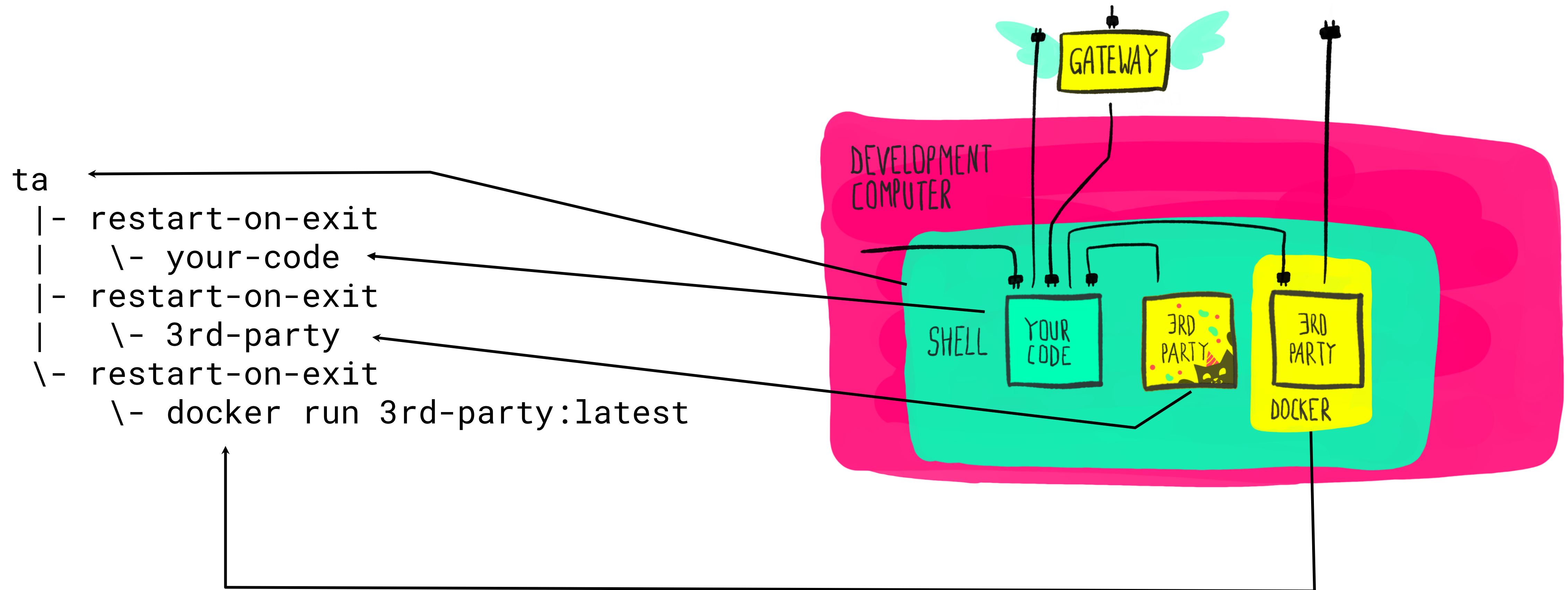
```
PK8000 BASIC 1987 версия 1.2
46873 Bytes free
Ok
10 PRINT "Hello wolrd!"
20 END
RUN
Hello wolrd!
Ok
10 PRINT "Hello world!"
RUN
Hello world!
Ok
█
```

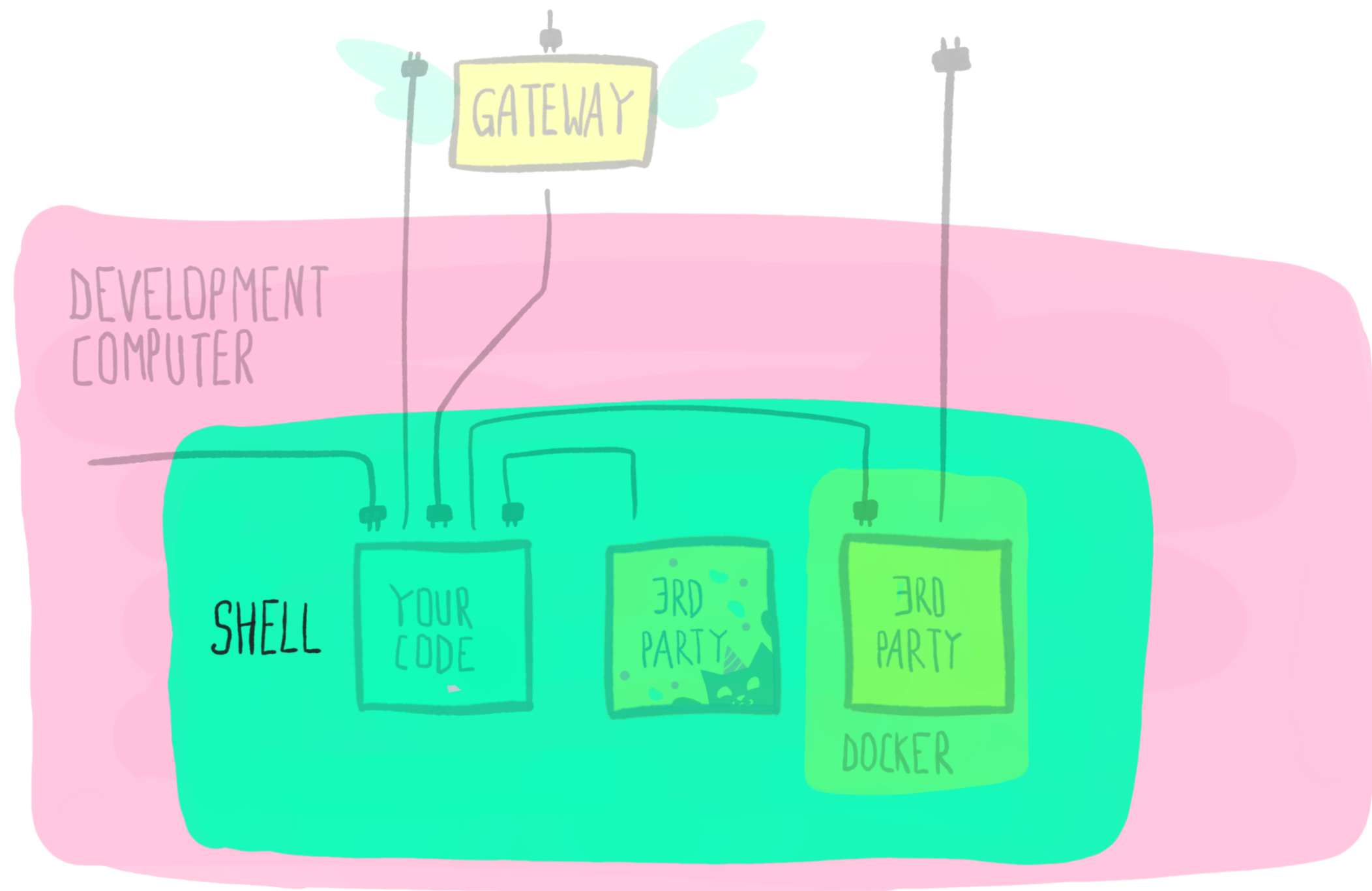
color auto goto list run

Realistically achievable

```
SunOS solaris 5.10 Generic_147147-26 sun4u sparc
SUNW,Sun-Fire-V210
  7:40pm up 80 day(s),  2:15,  3 users,  load
average: 0.03, 0.02, 0.02
dottedma@solaris$ vi hello.c
"hello.c" 6 lines, 75 characters
dottedma@solaris$ cc hello.c
dottedma@solaris$ ./a.out
Hello wordl!
dottedma@solaris$ vi hello.c
"hello.c" 6 lines, 75 characters
dottedma@solaris$ cc hello.c
dottedma@solaris$ ./a.out
Hello world!
dottedma@solaris$
```


Running distributed applications locally (2)





```
$ ta start
$ ta stop
$ ta destroy
$ ta attach
$ ta detach
```

```
[zsh@bohr:~/interactive/ta]% ./ta

Welcome to test application for interactive development.

URL:          http://127.0.0.1:8080/

Common keys:
Ctrl-] 0..9      Select window 0..9
Ctrl-] p,n       Select previous, next window
Ctrl-] w         Select window interactively
Ctrl-] [         Enter scrollbar/copy mode (ESC to exit)
Ctrl-s          to search in scrollbar in this mode
Ctrl-] d         Detach from the terminal (keep running in background)

CLI command is 'ta', run 'ta -h' for help.

This is tmux(1), so `man tmux` is useful.

Dealing with windows:

* Exited programs will be marked in status line.

* Ctrl-C sends SIGINT. It will stop the program inside, you can run your
  own (e.g. under debugger).

:
<Test Application> 0:help 1:static 2:traefik 3:backend-with-db[exited] 4:d>
```

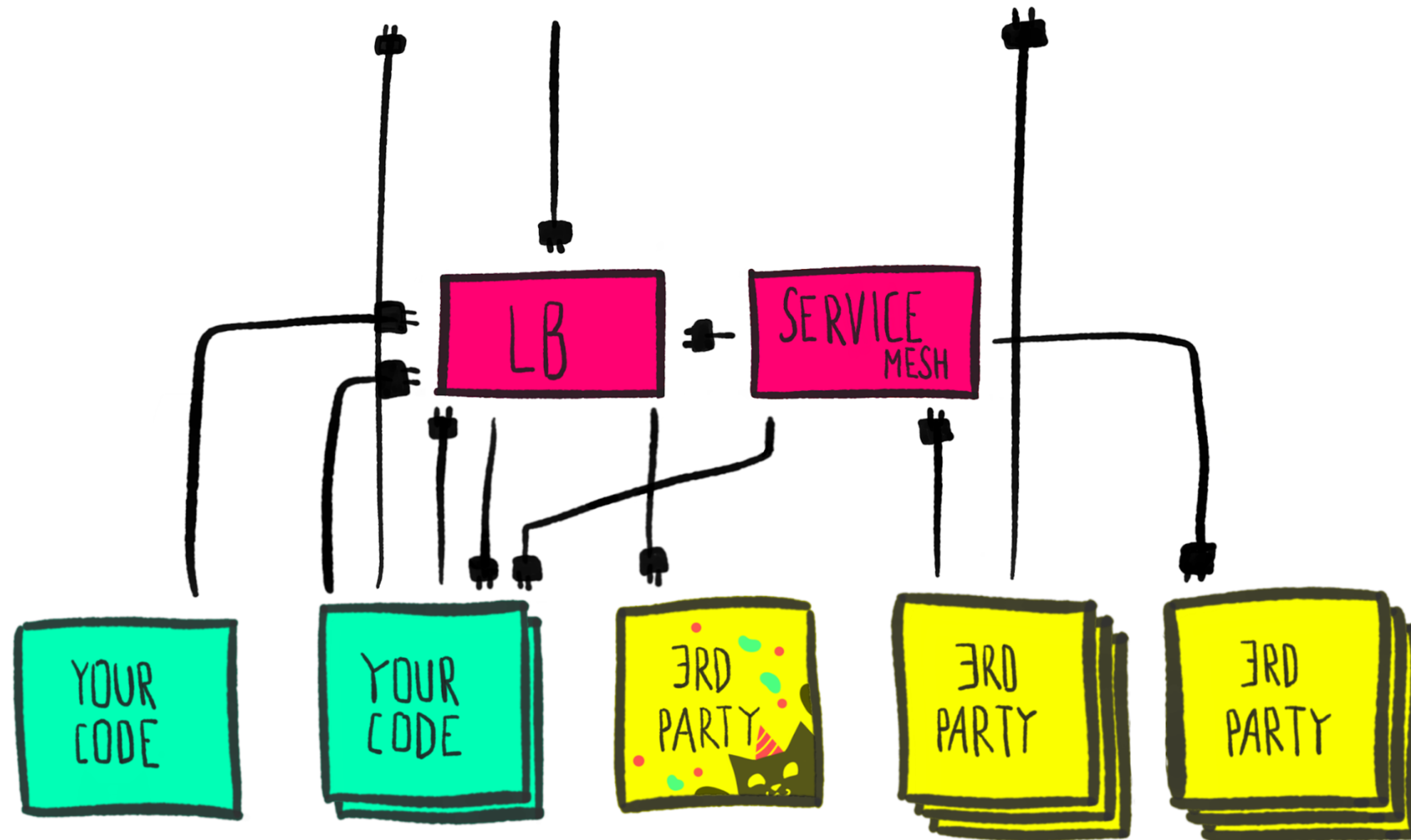
```
[zsh@bohr:~/interactive/ta]% ./ta

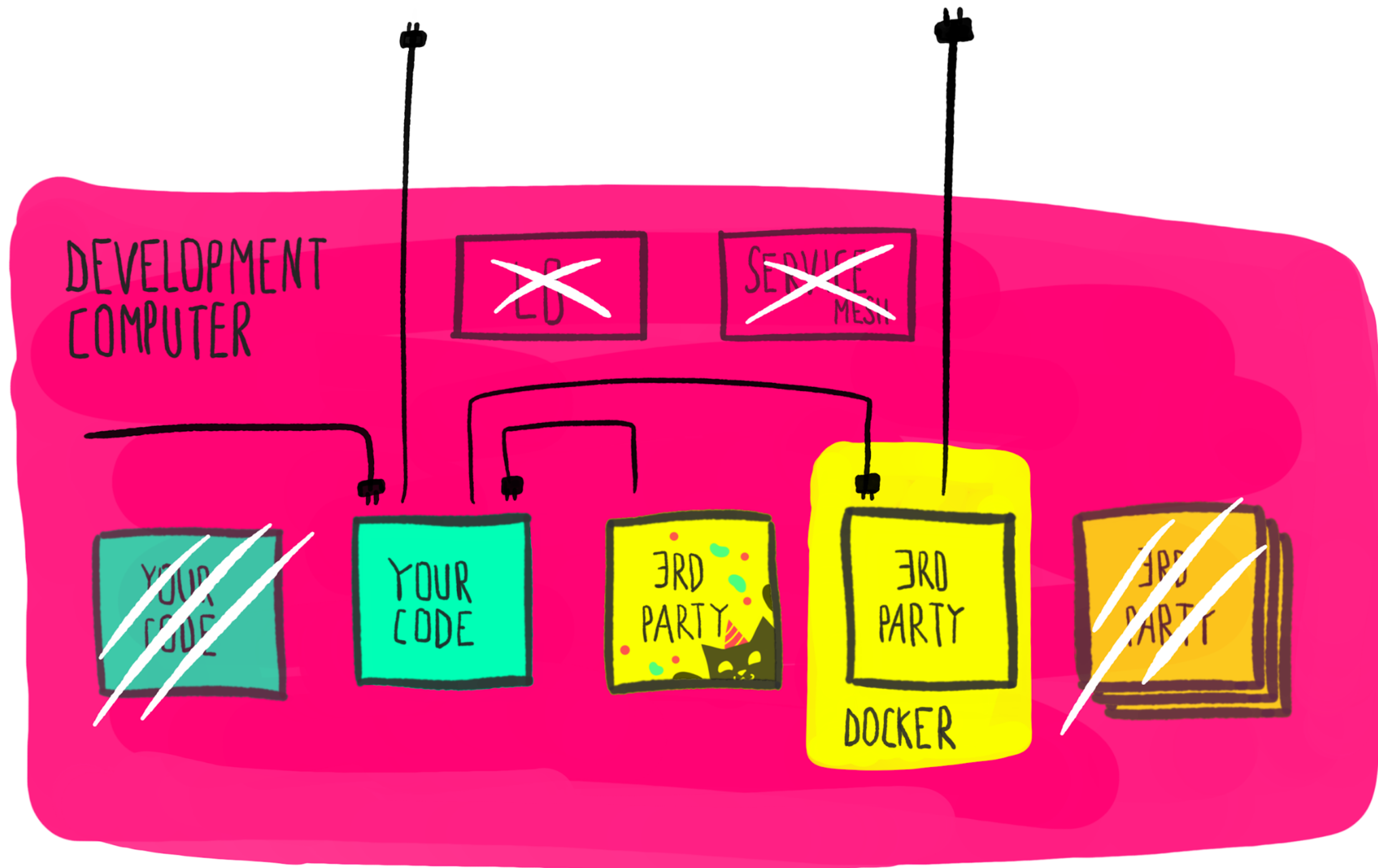
(0) - ta: 7 windows (attached)
(1) -> 0: help* (1 panes) "bohr.malta.dottedmag.net"
(2) -> 1: static (1 panes) "bohr.malta.dottedmag.net"
(3) -> 2: traefik (1 panes) "bohr.malta.dottedmag.net"
(4) -> 3: backend-with-db[exited] (1 panes) "bohr.malta.dottedmag.net"
(5) -> 4: db[exited] (1 panes) "bohr.malta.dottedmag.net"
(6) -> 5: backend-without-db[exited] (1 panes) "bohr.malta.dottedmag.net"
(7) -> 6: init[done] (1 panes) "bohr.malta.dottedmag.net"

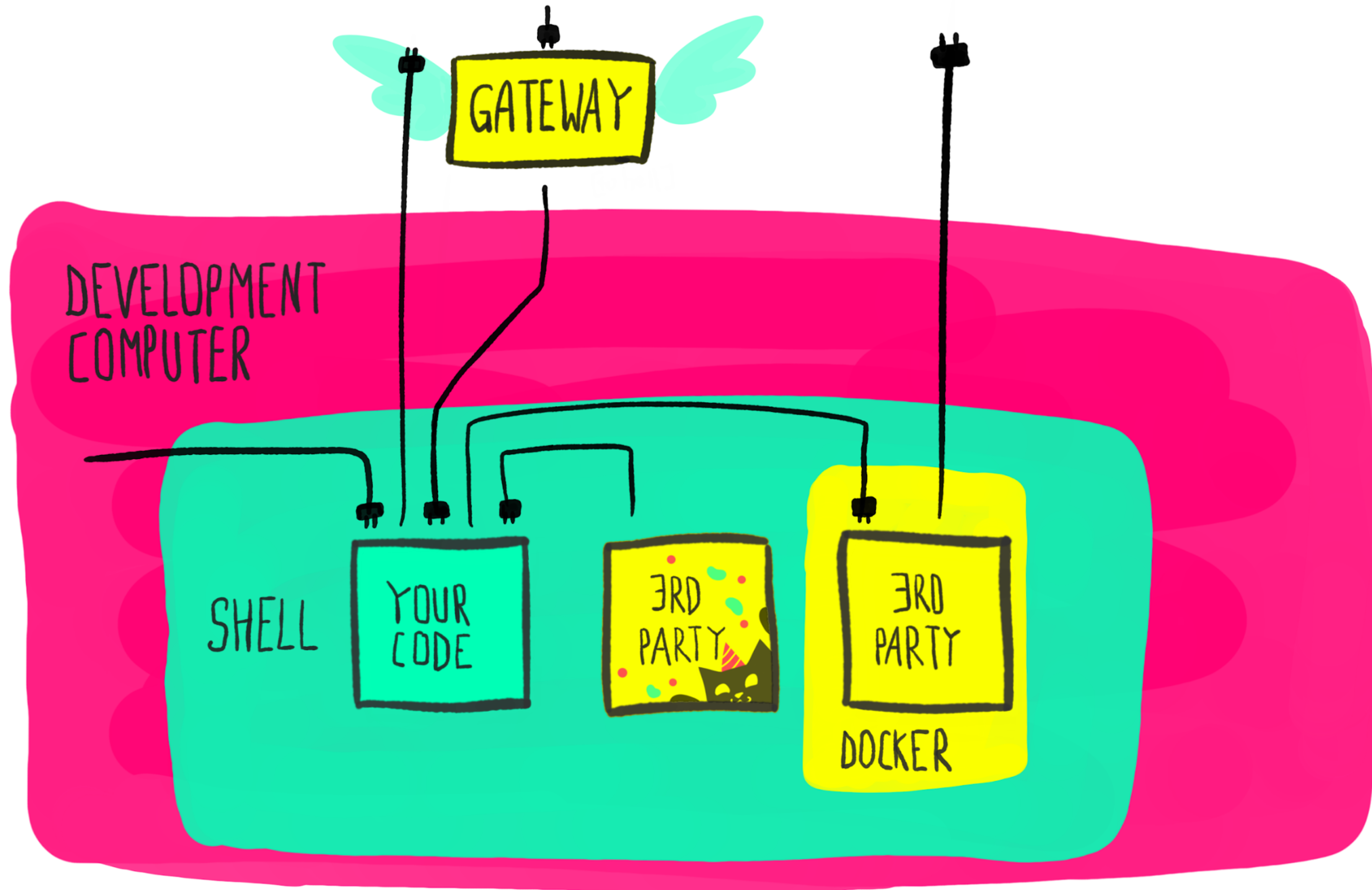
2 (sort: index)-----
64 --configfile=../src/traefik/traefik.toml --log=true --log.level=debug
time="2020-08-19T20:02:37+02:00" level=info msg="Configuration loaded from f
/Users/dottedmag/interactive/src/traefik/traefik.toml"

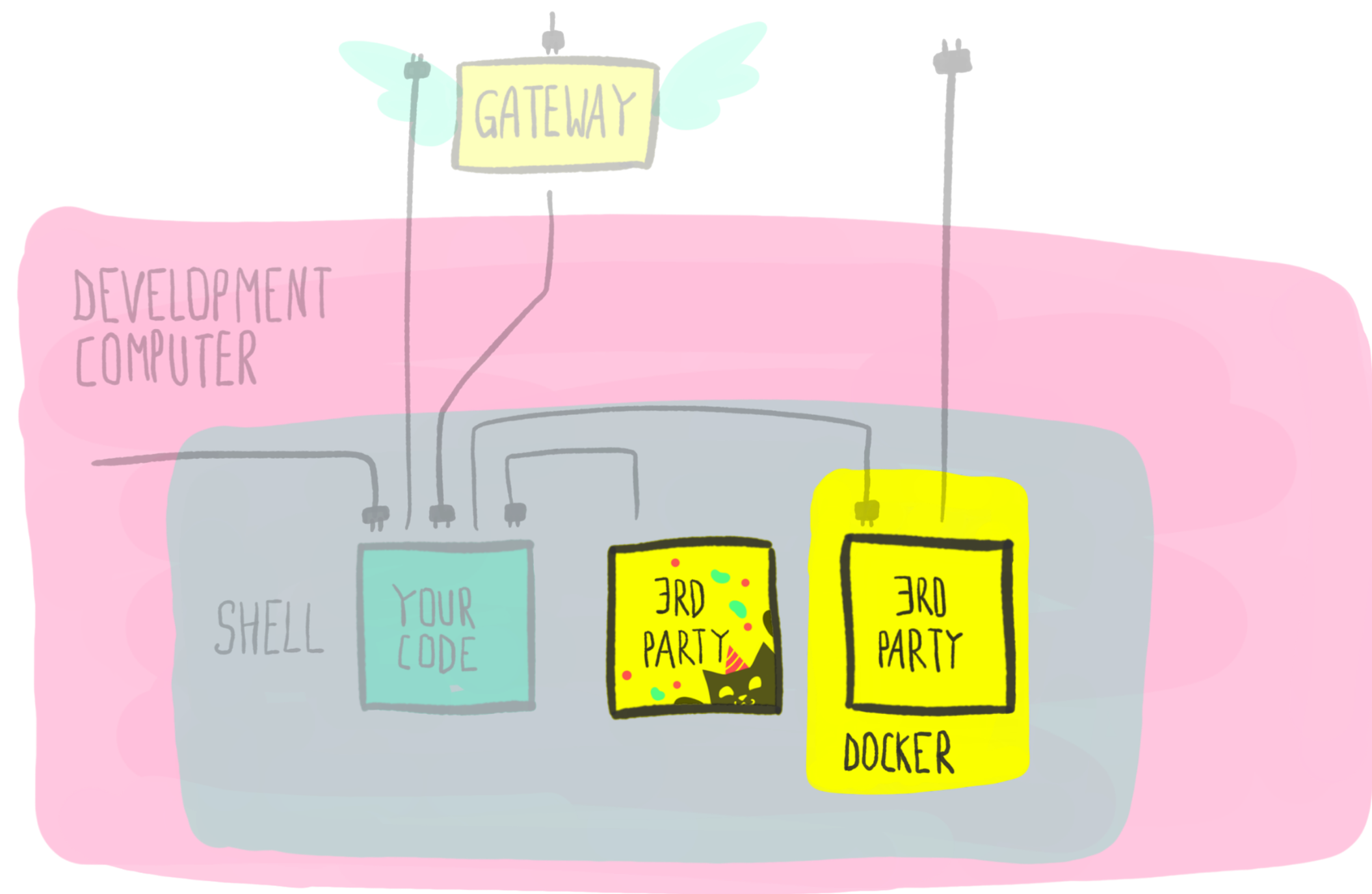
0

<Test Application> 0:help 1:static 2:traefik 3:backend-with-db[exited] 4:d>
```







Remove

Run natively

Replace it

Container

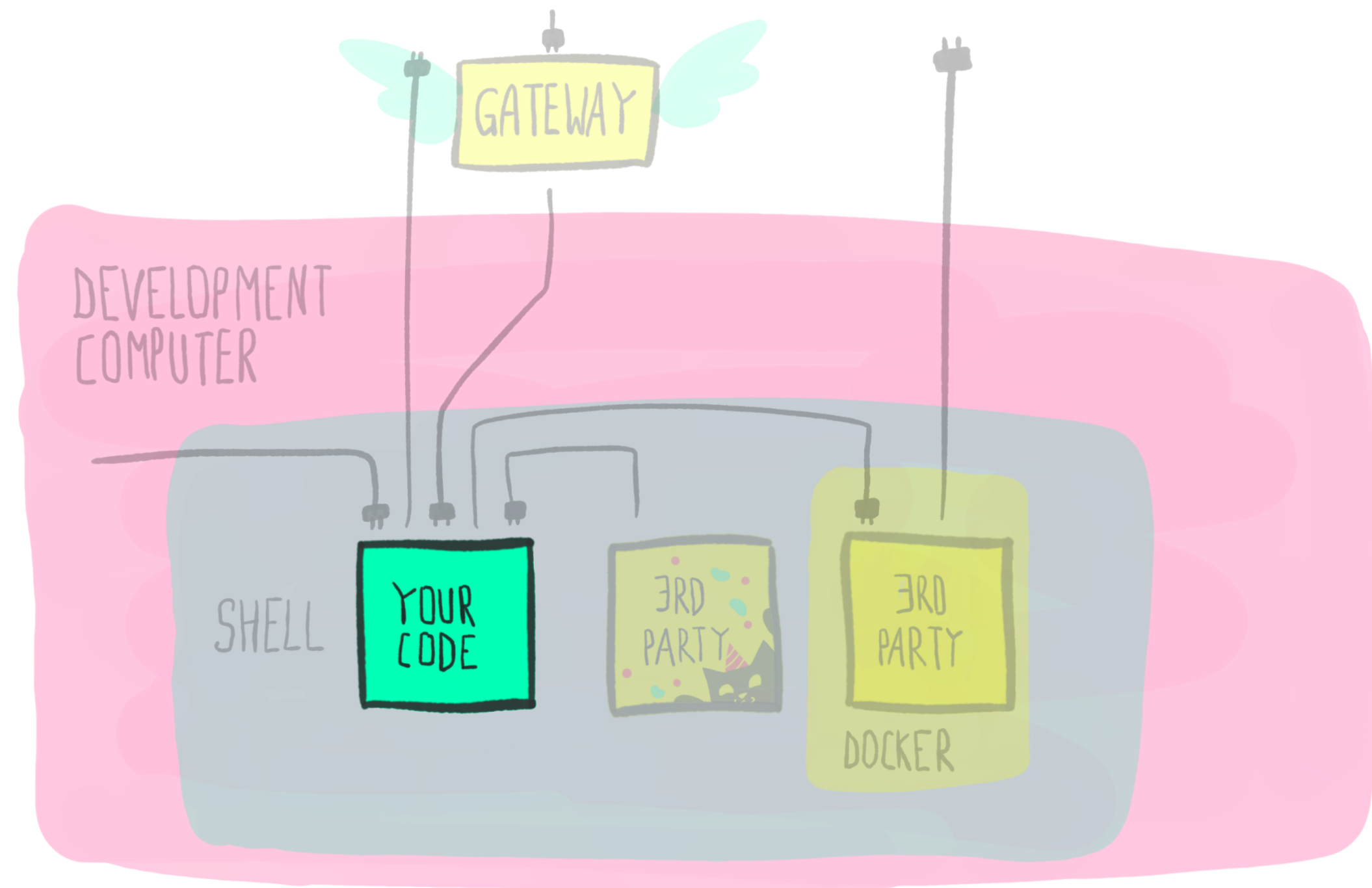
Example in test app

—

Træfik

PostgreSQL → BoltDB

PostgreSQL



```
[zsh@bohr:~/interactive/ta]% ./ta
Current directory is /Users/dottedmag/interactive/ta
Running parts/010-backend-with-db.service

+ cd ../src/backend
+ exec ta-gorun backend --boltdb-file=/Users/dottedmag/interactive/ta/_ta/data/b
ackend.db
+ name=backend
+ shift
+ go build -o /var/folders/bw/6hyp_vyj68v973qbhlbcv1cr0000gn/T//ta/backend .
+ exec /var/folders/bw/6hyp_vyj68v973qbhlbcv1cr0000gn/T//ta/backend --boltdb-fil
e=/Users/dottedmag/interactive/ta/_ta/data/backend.db
unknown flag: --boltdb-file
Usage of /var/folders/bw/6hyp_vyj68v973qbhlbcv1cr0000gn/T//ta/backend:
  --boltdb-file string      BoltDB file
  --listen string           listen address (default ":44444")
  --postgresql-url string   PostgreSQL URL to connect
unknown flag: --boltdb-file

<<exited with code 2>>

Press Enter to restart

<Test Application> <atic 2:traefik 3:backend-with-db[exited] 4:db[exited] 5>
```

fix code → press “Enter” → done

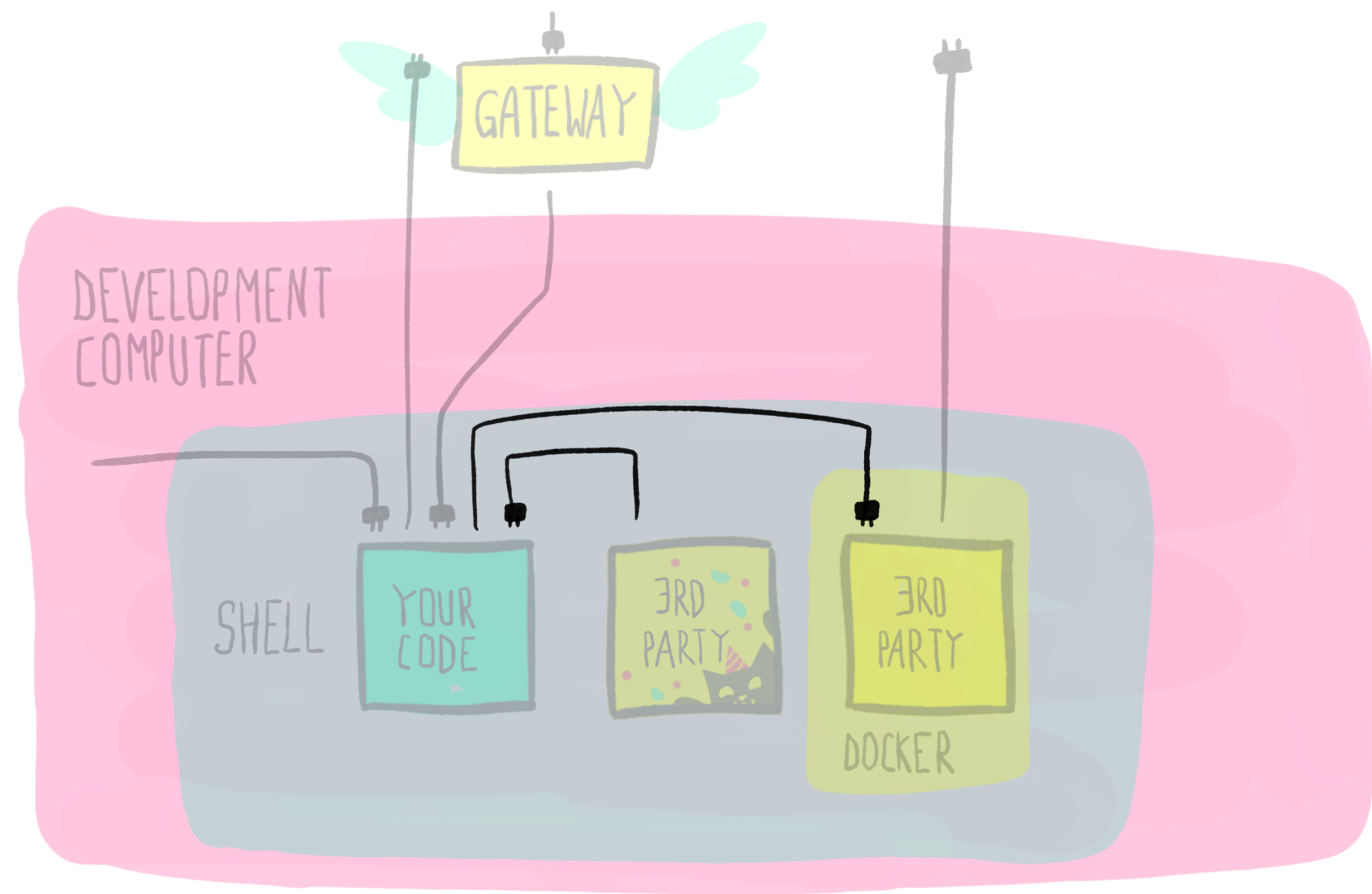
```
[zsh@bohr:~/interactive/ta]% ./ta
Current directory is /Users/dottedmag/interactive/ta
Running parts/010-backend-with-db.service

+ cd ../src/backend
+ exec ta-gorun backend --boltdb-file=/Users/dottedmag/interactive/ta/_ta/data/b
ackend.db
+ name=backend
+ shift
+ go build -o /var/folders/bw/6hyp_vyj68v973qbhlbcv1cr0000gn/T//ta/backend .
+ exec /var/folders/bw/6hyp_vyj68v973qbhlbcv1cr0000gn/T//ta/backend --boltdb-fil
e=/Users/dottedmag/interactive/ta/_ta/data/backend.db

<Test Application> <1:static 2:traefik 3:backend-with-db 4:db[exited] 5:bac>
```

Project-specific. Ideally:

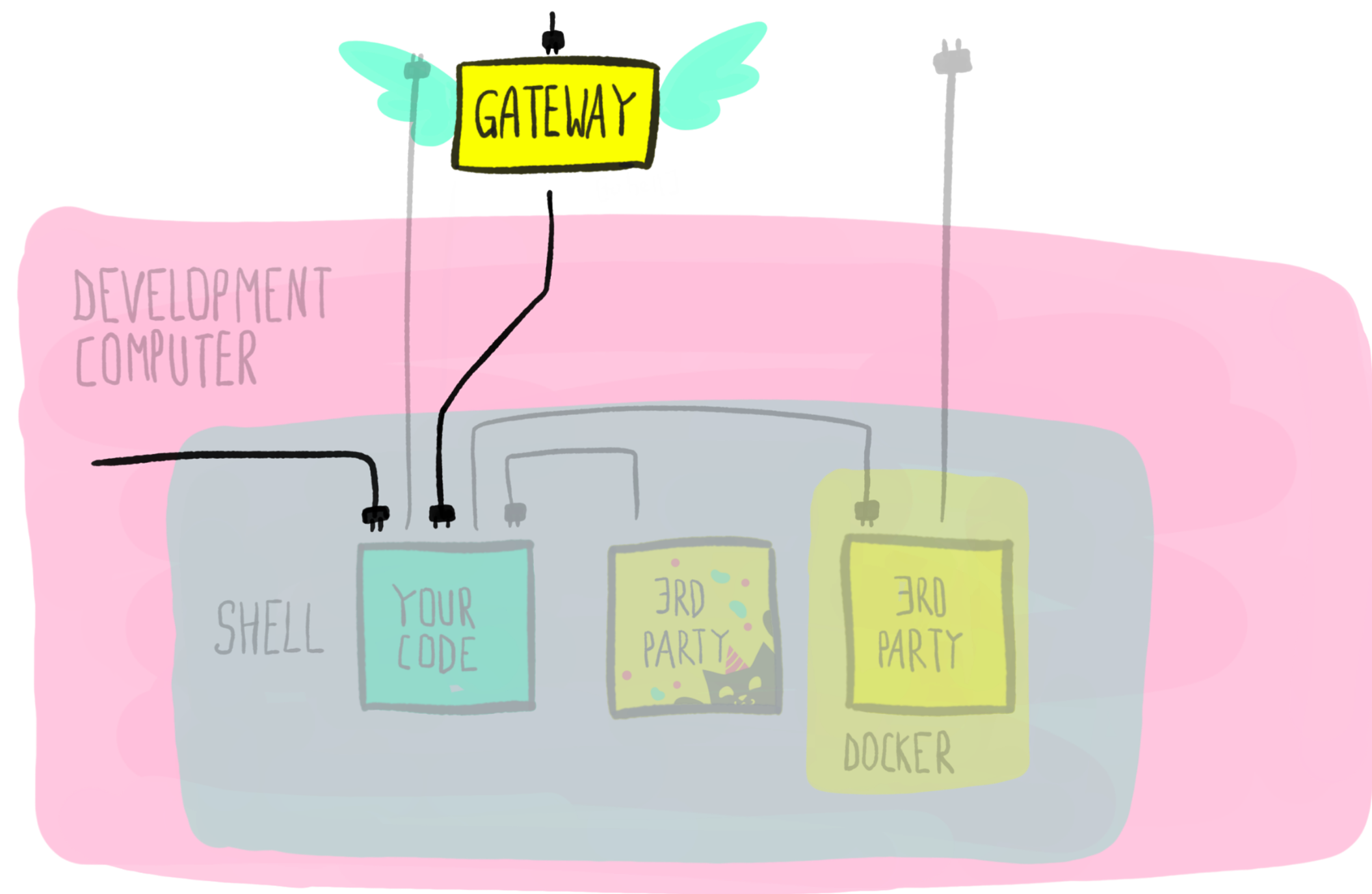
- go run
- hot code reload



```
serviceA --listen=:44444
```

```
serviceB --listen=:44445 --serviceA-url=http://localhost:4444/
```

```
frontend: listen on 8000, use http://localhost:44444/ and  
http://localhost:44445/
```

- Gateway VM + HTTP server + SSH forwarding
- Gateway VM + SSH forwarding
- ngrok.io or similar

State



- One dir
 - via configuration
 - via Docker mounts
 - Logs too
- `ta destroy` removes `_ta`



Sync with production configuration



- Sync manually
- Generate
 - Prod configs → dev configs
 - Abstract description → prod configs, dev configs



Q&A

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Test application

<https://github.com/ridge/interactive>

Kittens courtesy of 





Thanks

