Golang, Micro Service, Continuous Delivery and Docker

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DAOCLOUD

README.md

Development Challenge

Solution of Challenge: **Micro Service**

Challenge of Solution of Challenge

Solution of Challenge of Solution: **Docker**

Demo

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Iteration 1

```go
func main() {
    http.HandleFunc("/", Hello)

    fmt.Println("Start listening...")

    err := http.ListenAndServe(":4040", nil)
    if err != nil {
        panic(err)
    }
}

func Hello(res http.ResponseWriter, req *http.Request) {
    fmt.Fprintln(res, getHelloMsg())
}

func getHelloMsg() string {
    return "Let's Shopping!"
}
```

Iteration 1

```go
func TestGetHelloMsg(t *testing.T) {
    msg := getHelloMsg()
    if msg != "Let's Shopping!" {
        t.Error("Get hello message error")
    }
}
```

> go install github.com/DaoCloud/shop

> go test github.com/DaoCloud/shop

CHEERS

Iteration 2

```go
func GetPerson() string {
    conn := "admin:admin@daocloud.io"

    session, err := mgo.Dial(conn)
    if err != nil {
        panic(err)
    }
    defer session.Close()
    session.SetMode(mgo.Monotonic, true)

    // Collection People
    c := session.DB(db).C("people")

    result := Person{}
    err = c.Find(bson.M{"name": "DaoCloud"}).Select(bson.M{"phone": 0}).One(&result)
    if err != nil {
        panic(err)
    }
    return fmt.Sprintf("%v", reflect.ValueOf(&result).Elem().Field(1))
}
```

Iteration 2

```
var _ = Describe("Shop", func() {
    Describe("Adding and retreving Person object from MongoDB", func() {
        Context("inspecting their name", func() {
            It("should result 'DaoCloud'", func() {
                Expect(GetResult()).To(Equal("DaoCloud"))
            })
        })
    })
})
```

```
> go install github.com/DaoCloud/shop
```

```
> go test github.com/DaoCloud/shop
```

NOT BAD

Iteration 3

Iteration 4

Iteration 5

Iteration 6

Iteration 7

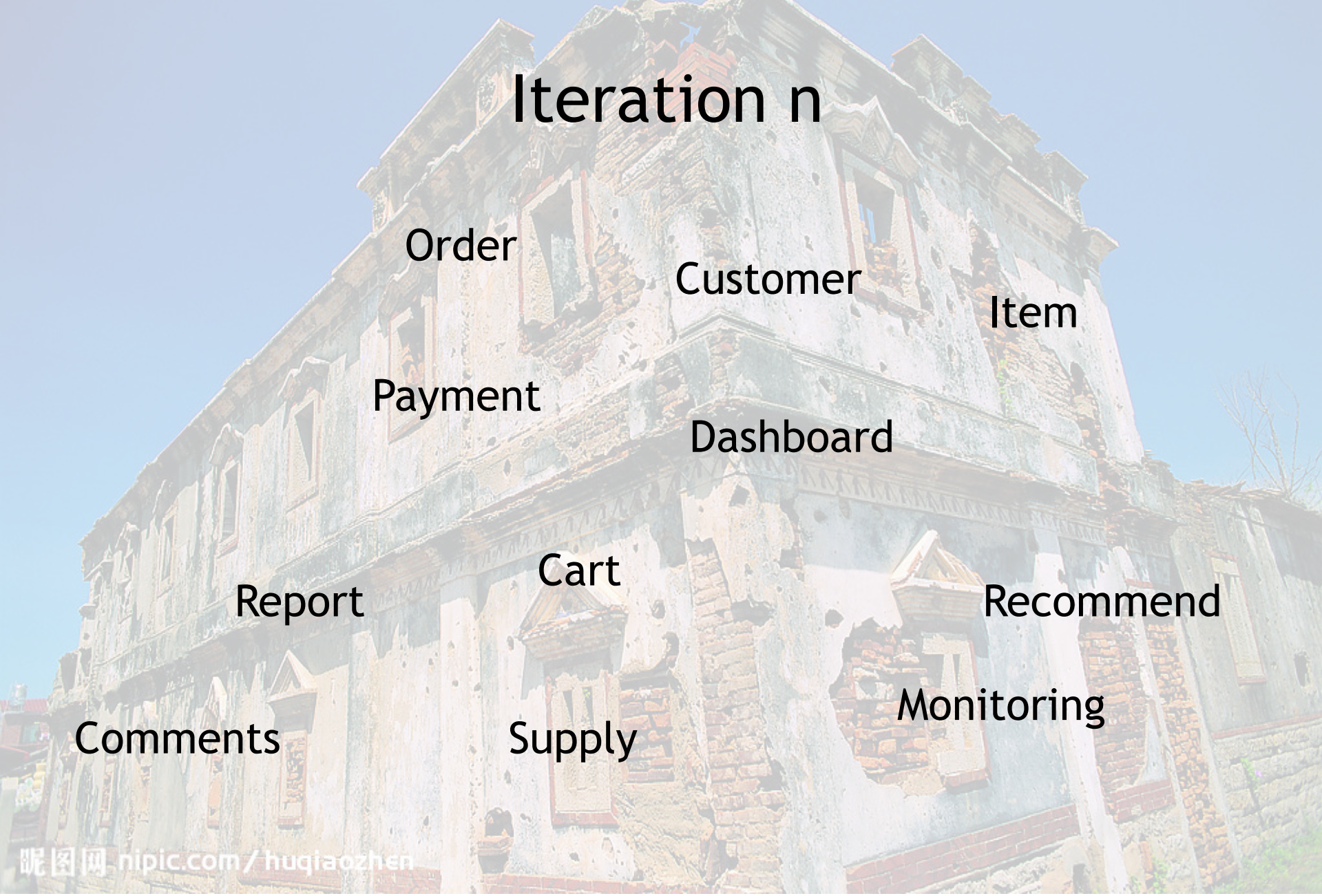
Iteration 8

Iteration 9

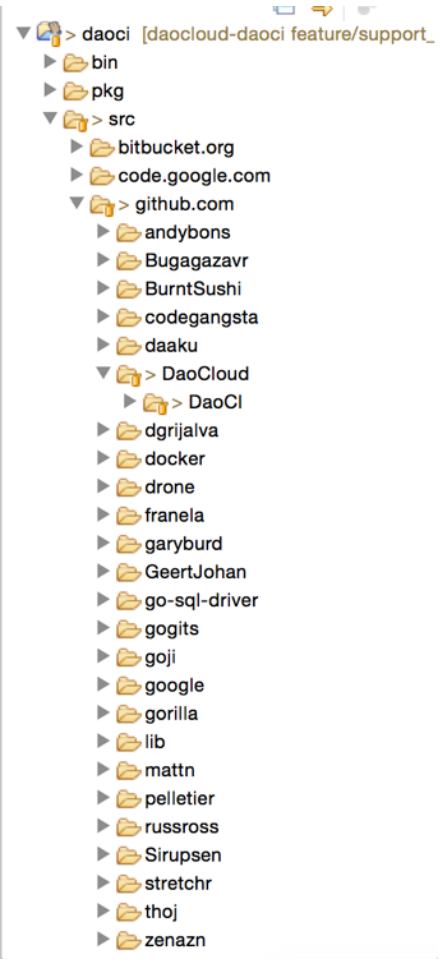
Iteration ...

GET CRAZY

Iteration n


Order
Customer
Item
Payment
Dashboard
Cart
Report
Recommend
Monitoring
Comments
Supply
昵图网 nipic.com/huqiaozhen

Intimidate Developers



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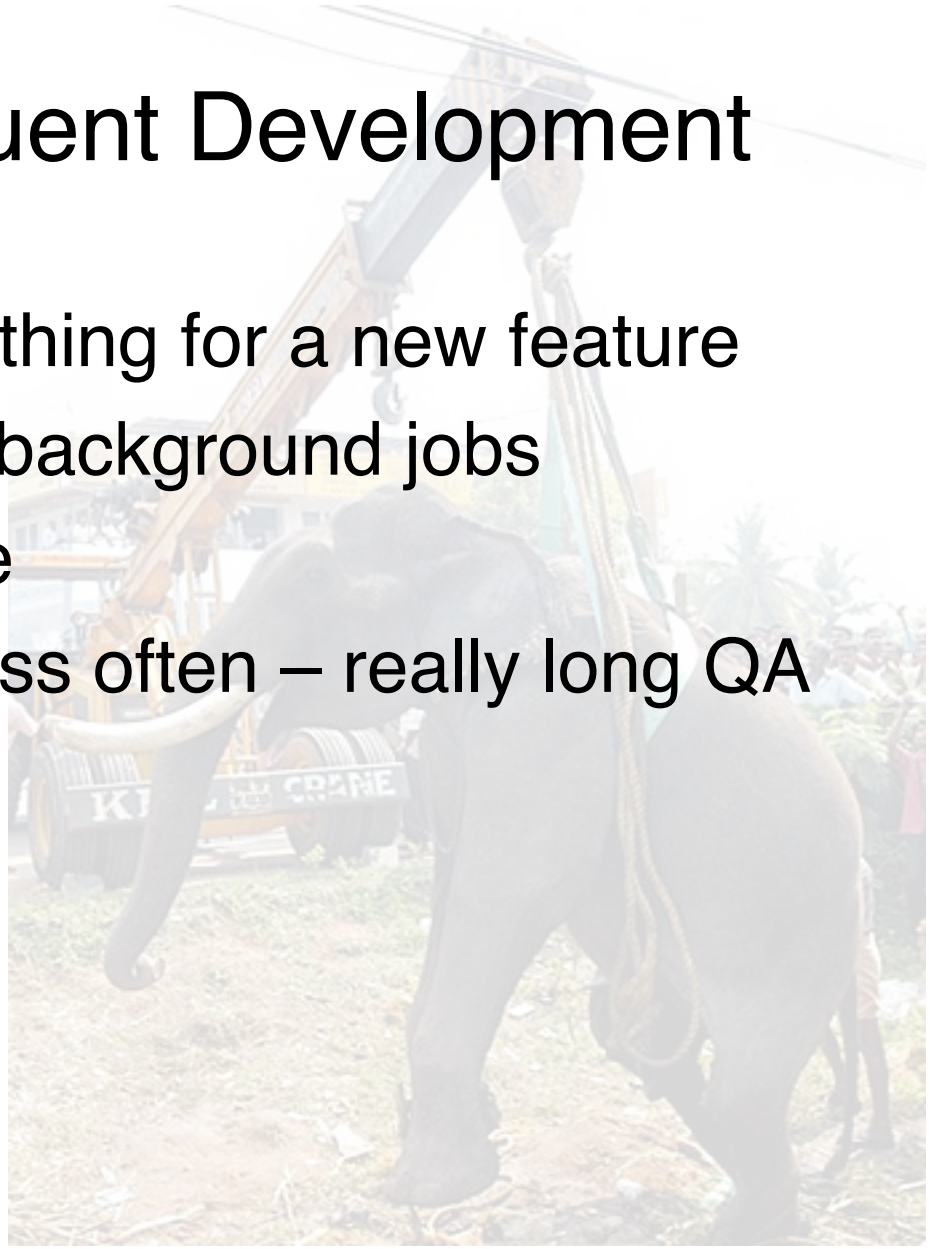
Obstacle to Frequent Development

- Need to redeploy everything for a new feature
- Interrupts long running background jobs
- Increasing risk of failure
- Updates will happen less often – really long QA cycles



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Overloads Your IDE and Focus

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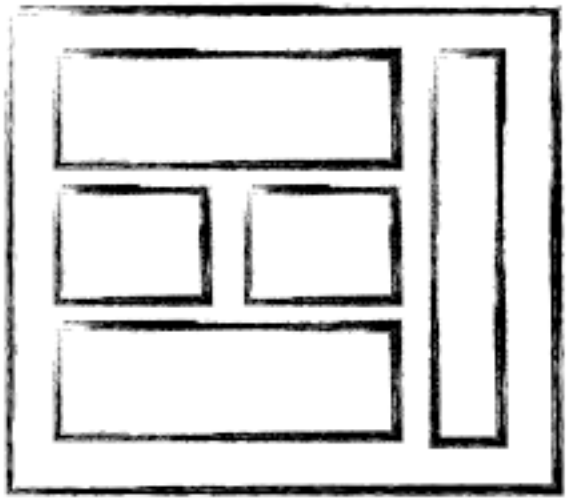
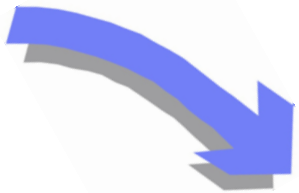
Require long-term commitment to a tech stack



Monolithic/Layered



Micro Services

MicroService needs Self-Sufficient

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Vendoring/Versioning

http://godoc.org/github.com/tools/godep

```
$ godep save
```

```
{
    "ImportPath": "github.com/kr/hk",
    "GoVersion": "go1.1.2",
    "Deps": [
        {
            "ImportPath": "code.google.com/p/go-netrc/netrc",
            "Rev": "28676070ab99"
        },
        {
            "ImportPath": "github.com/kr/binarydist",
            "Rev": "3380ade90f8b0dfa3e363fd7d7e941fa857d0d13"
        }
    ]
}
```

Import Proxy

gopkg.in
Stable APIs for the Go language

```
gopkg.in/pkg.v3      → github.com/go-pkg/pkg (branch/tag v3, v3.N, or v3.N.M)
gopkg.in/user/pkg.v3 → github.com/user/pkg   (branch/tag v3, v3.N, or v3.N.M)
```

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Self-Sufficient ≠ Code-Sufficient

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Build, Ship and Run Any App, Anywhere

Docker - An open platform for distributed applications for developers and sysadmins.

* Powered by Linux Containers.

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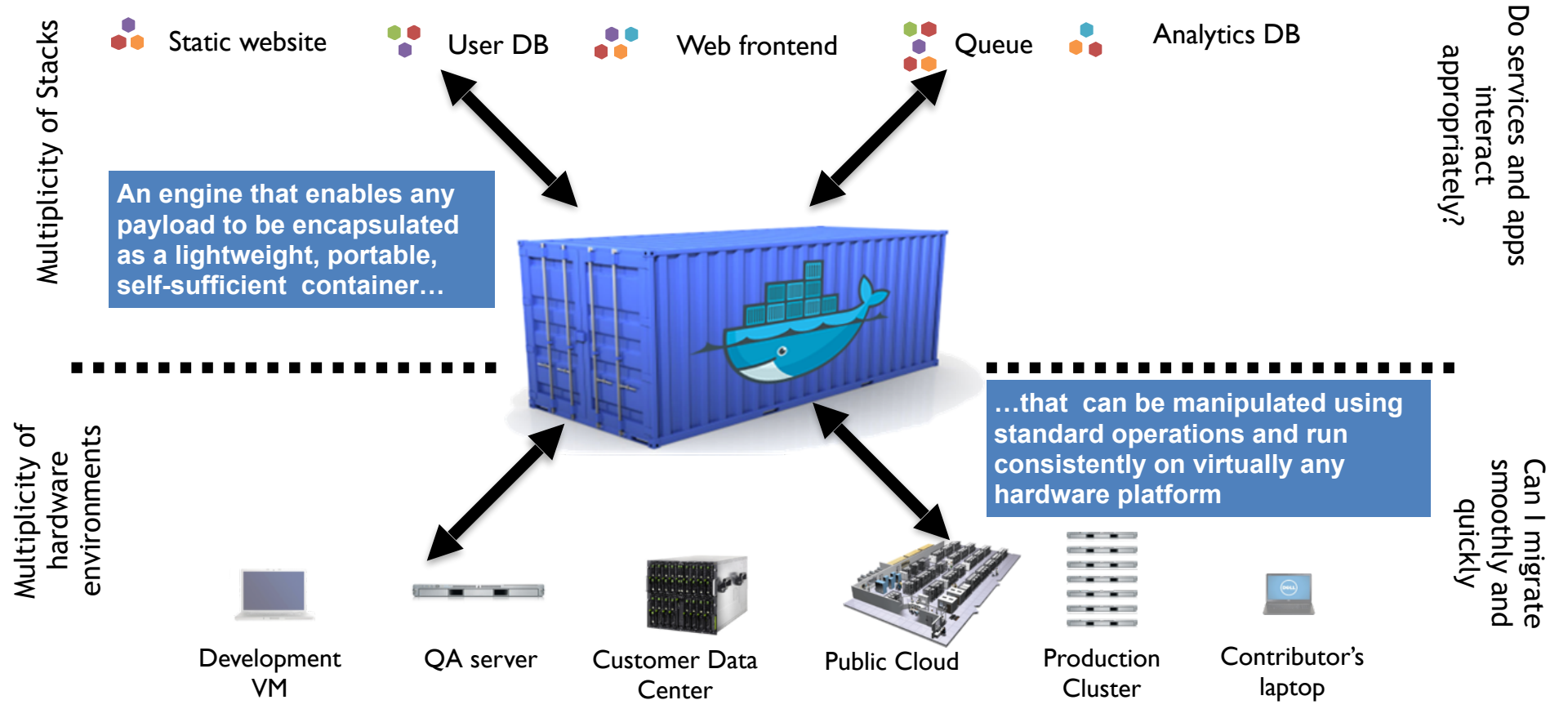
Docker is a shipping container system for code



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Self-sufficient in Docker Way

- A Docker container contains everything it needs to run:
  - Minimal base OS
  - Libraries and frameworks
  - Application code

Self-sufficient in Docker Way - Dockerfile

```
# Start from a Debian image with the latest version of Go installed
# and a workspace (GOPATH) configured at /go.
FROM golang:1.3.3

# Copy the local package files to the container's workspace.
ADD . /go/src/github.com/DaoCloud/shop

# Build the app inside the container.
# (You may fetch or manage dependencies here,
# either manually or with a tool like "godep".)
RUN go install github.com/DaoCloud/shop

# Run the app by default when the container starts.
ENTRYPOINT /go/bin/shop

# Document that the service listens on port 4040.
EXPOSE 4040
```

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Docker & Micro Service

- ✓ Develop simplest possible solution
- ✓ Configuration is a runtime constraint
- ✓ Not extra-extra-complex application

Dev

```
new WebServer().start(8080);
```

Ops

- ✓ Manage hardware / infrastructure
- ✓ Monitoring / backups
- ✓ Not apps implementation details

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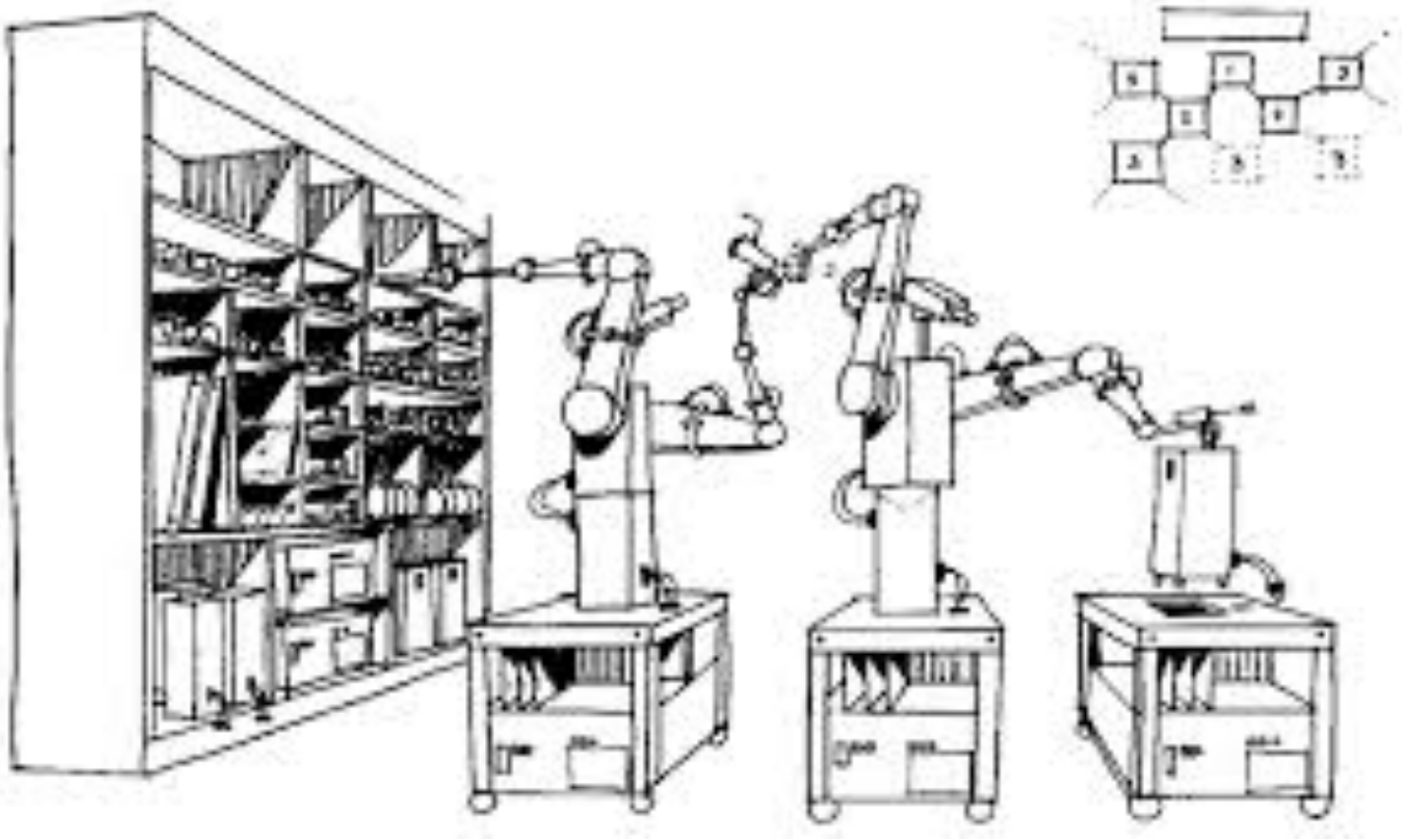
MicroService needs CI/CD



Automation is Implicit

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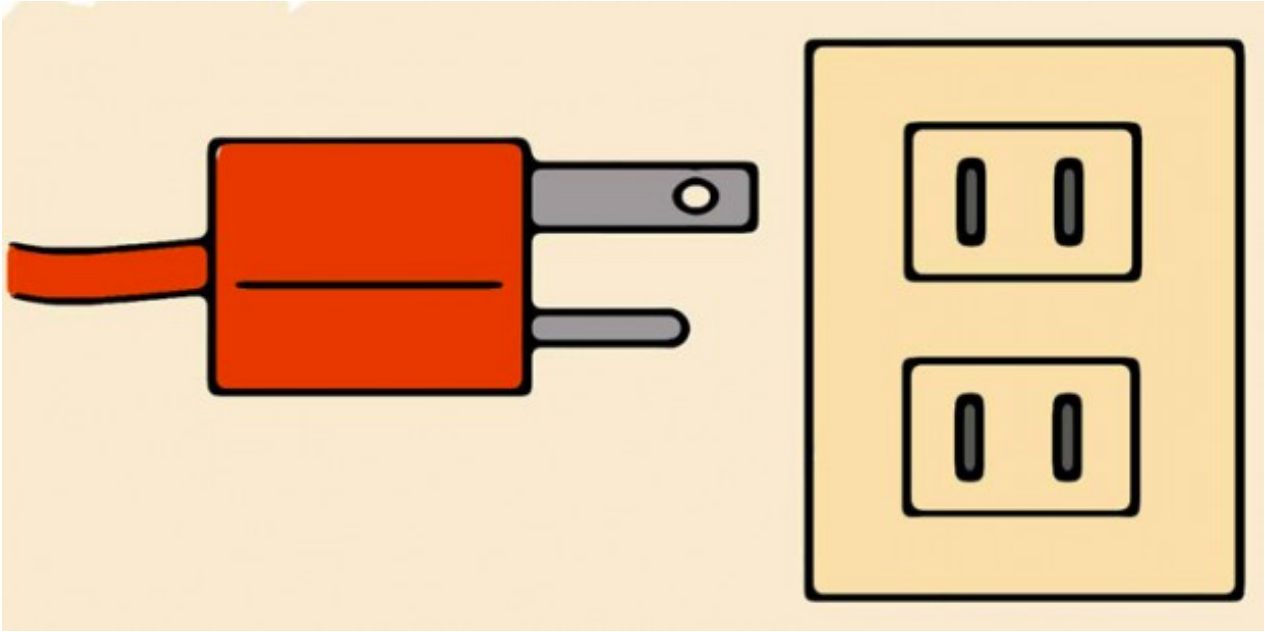
Continuous Integration

Continuous Integration is the practice of integrating early and often, so as to avoid the pitfalls of "Integration Hell".



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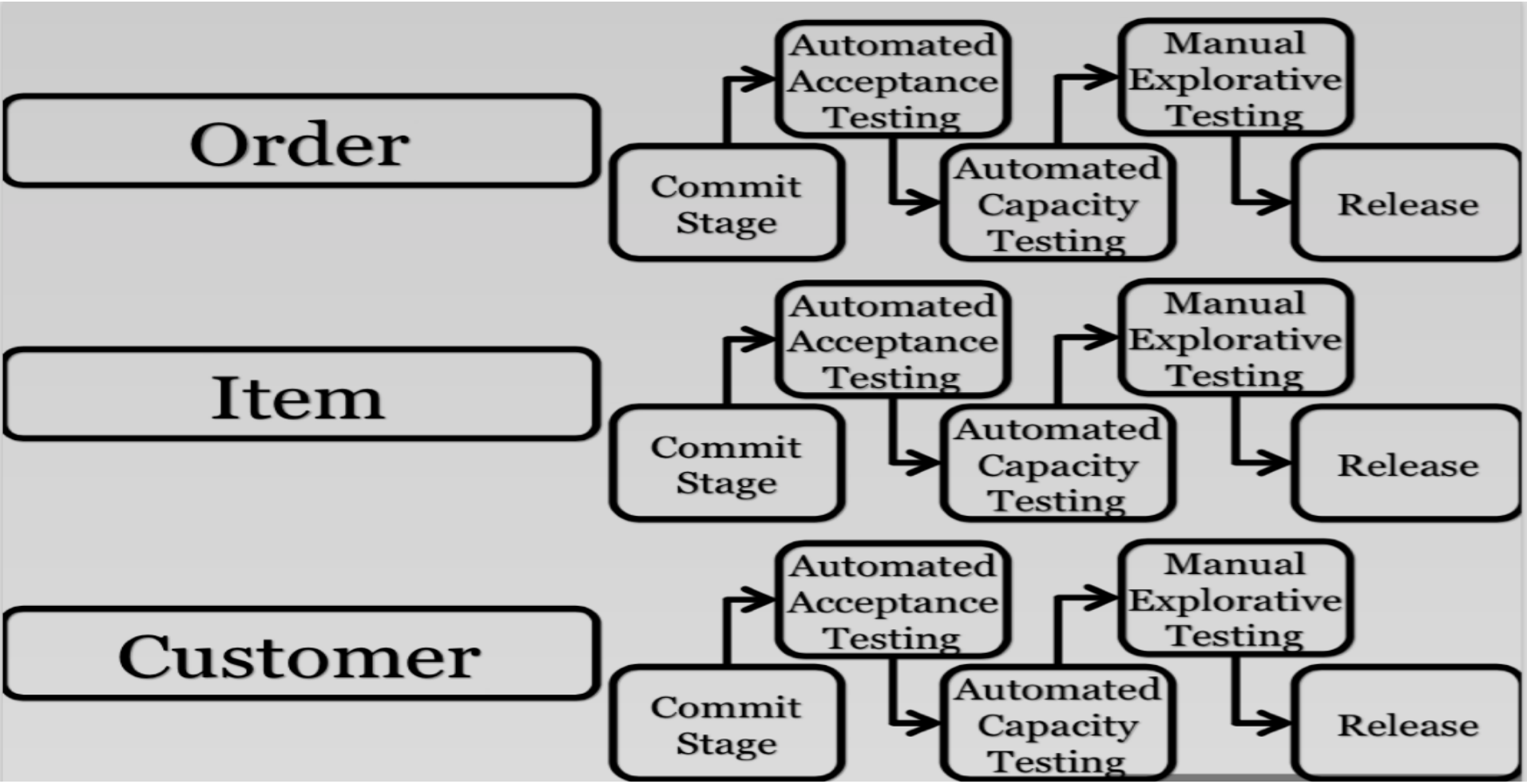
Continuous Integration to Continuous Diverse!



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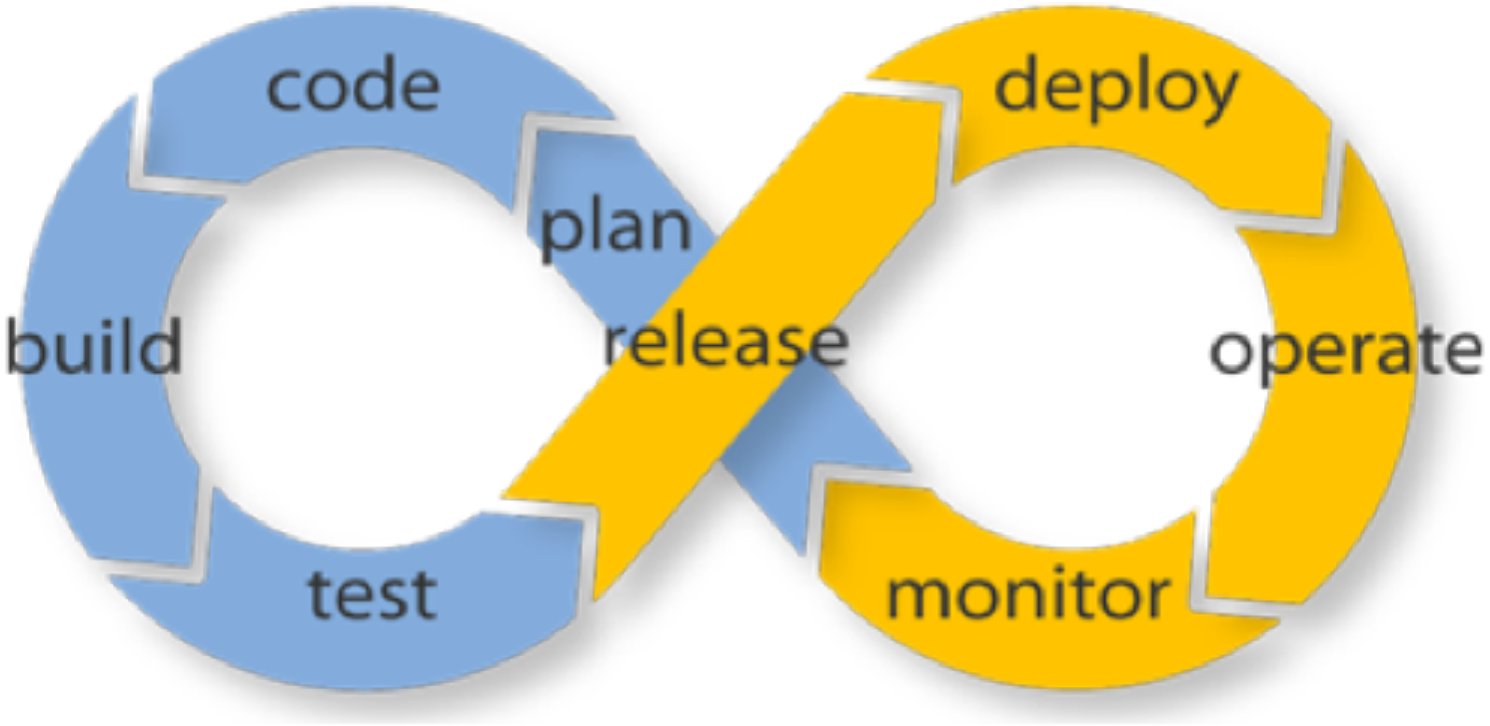
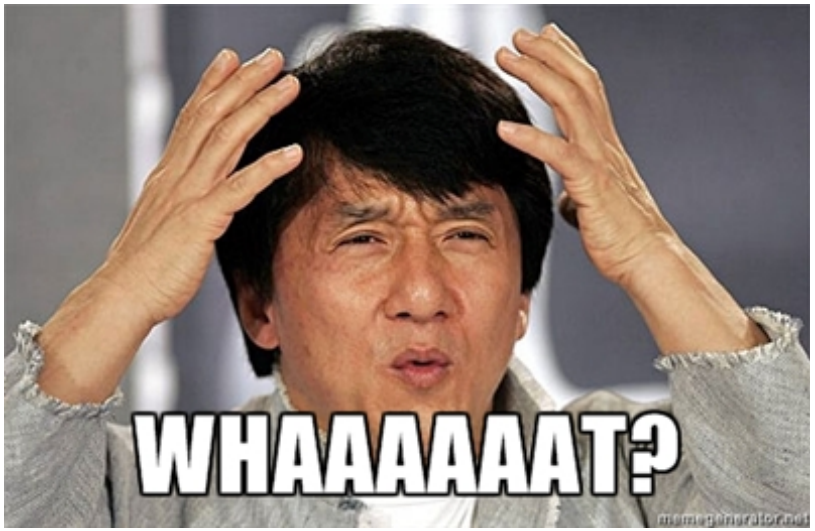
Continuous Integration to Continuous Delivery



Duang, Duang…



“Works for me”
“You need start A first”
“A with version 1.2.5-xx cannot work with B with version 2.0.7”
“So to trigger the bug you have to install X and Y then configure A, B and C, then download the extra file, put it in this directory.

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Docker Compose

- One binary to start/manage multiple containers and volumes on a single Docker host
- Originated from Fig
- Move your `docker run` commands to a YAML file

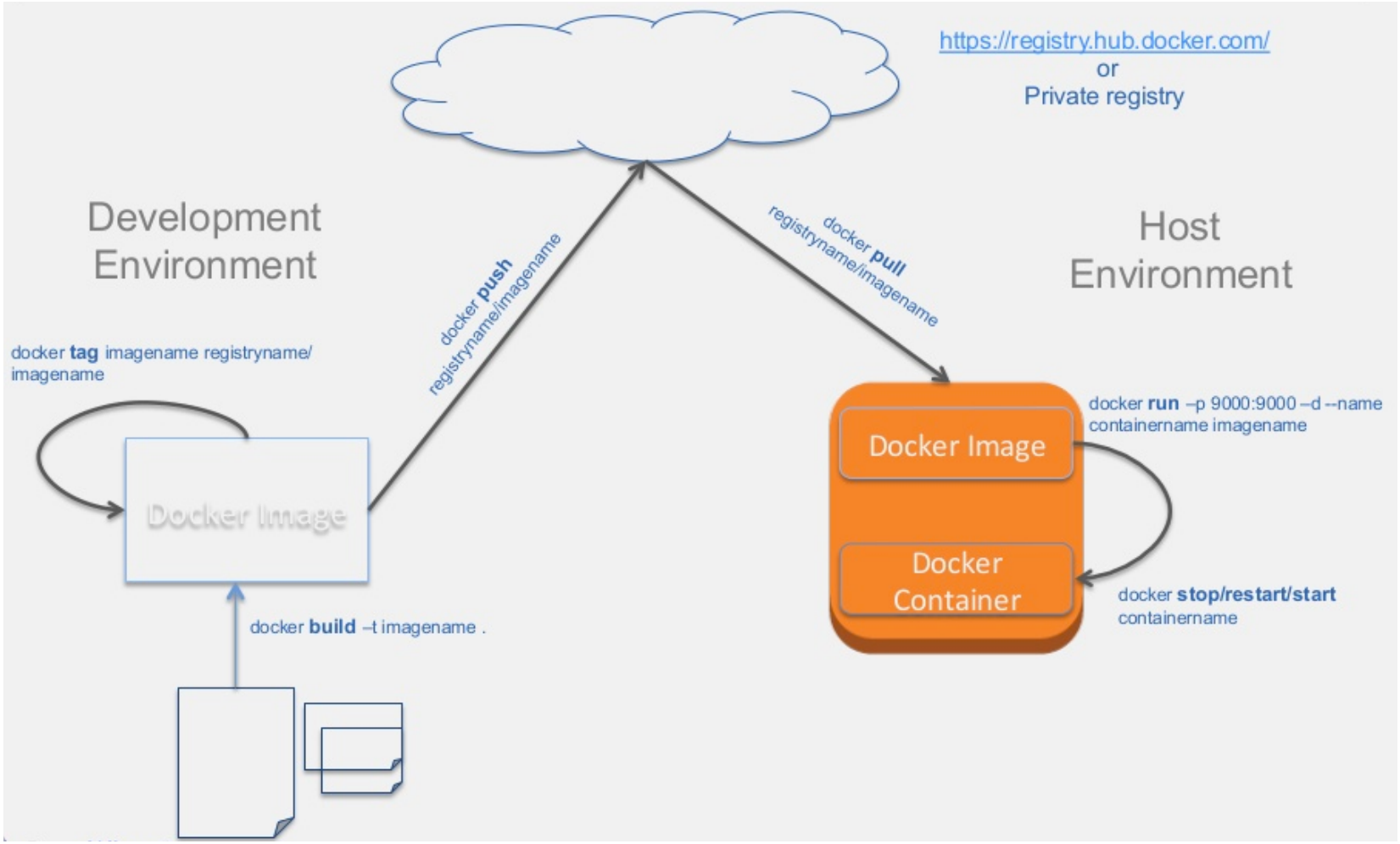
YAML description

```
wordpress:
  image: wordpress
  links:
   - mysql
  ports:
   - "80:80"
  environment:
   - WORDPRESS_DB_NAME=wordpress
   - WORDPRESS_DB_USER=wordpress
   - WORDPRESS_DB_PASSWORD=wordpresspwd
mysql:
  image: mysql
  volumes:
   - /home/docker/mysql:/var/lib/mysql
  environment:
   - MYSQL_ROOT_PASSWORD=wordpressdocker
   - MYSQL_DATABASE=wordpress
   - MYSQL_USER=wordpress
   - MYSQL_PASSWORD=wordpresspwd
```

Use

```
$ docker-compose up -d
Creating vagrant_mysql_1...
Creating vagrant_wordpress_1...
$ docker-compose ps
Name                    Command                          State
Ports
-------------------------------------------------------------------
vagrant_mysql_1         /entrypoint.sh mysqld             Up
3306/tcp
vagrant_wordpress_1     /entrypoint.sh apache2-for ...    Up
0.0.0.0:80->80/tcp
```

Reproducible Delivery



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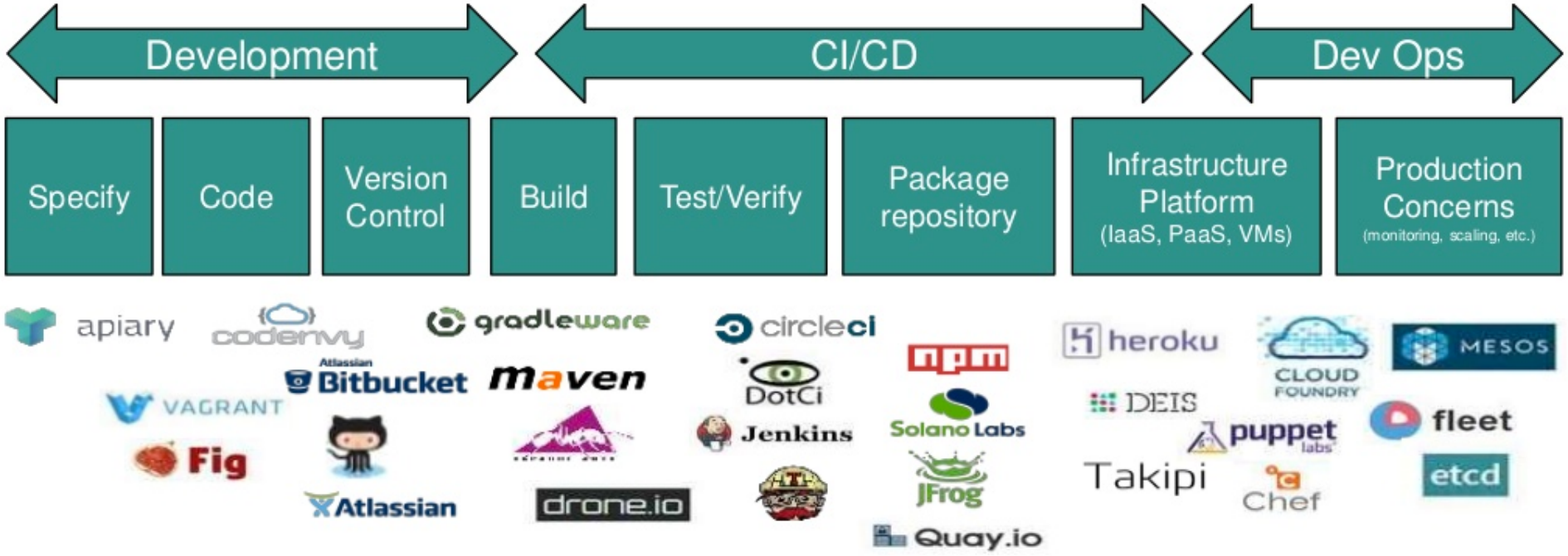
The Landscape with Containers



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Demo

Q&A

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