

A blue-tinted night photograph of a city skyline reflected in water, with a bridge in the foreground. The text "Bootstrapping Microservices" is overlaid in the center.

Bootstrapping Microservices

A blue-tinted photograph of a narrow canyon. In the background, a waterfall cascades down a rocky ledge. The canyon walls are rugged and textured. The overall mood is serene and natural.

What is a Microservice?

The background of the image is a dark blue, textured surface covered with numerous water droplets of various sizes. The droplets are more prominent in the upper half and become smaller and more blurred towards the bottom. The overall lighting is soft, creating a moody and atmospheric effect.

Microservices are an organizational
scaling tool

A blue-tinted photograph of a forest path. The path is covered in fallen leaves and leads into the distance. On the left, there are large, mature trees with thick trunks. On the right, there is a wooden fence. In the distance, two people are walking away from the camera. The overall atmosphere is quiet and somewhat somber due to the monochromatic color scheme.

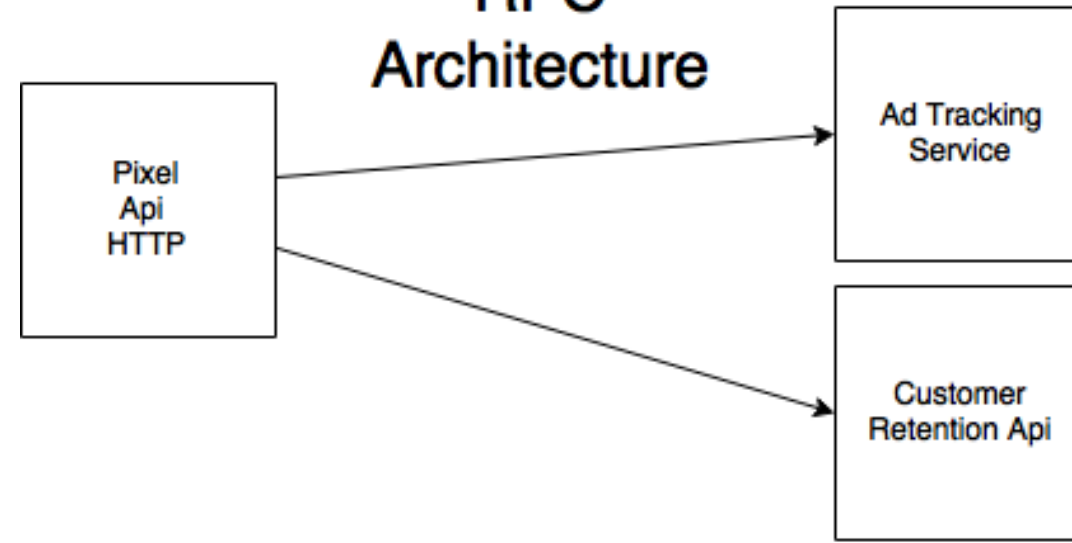
Monoliths are great



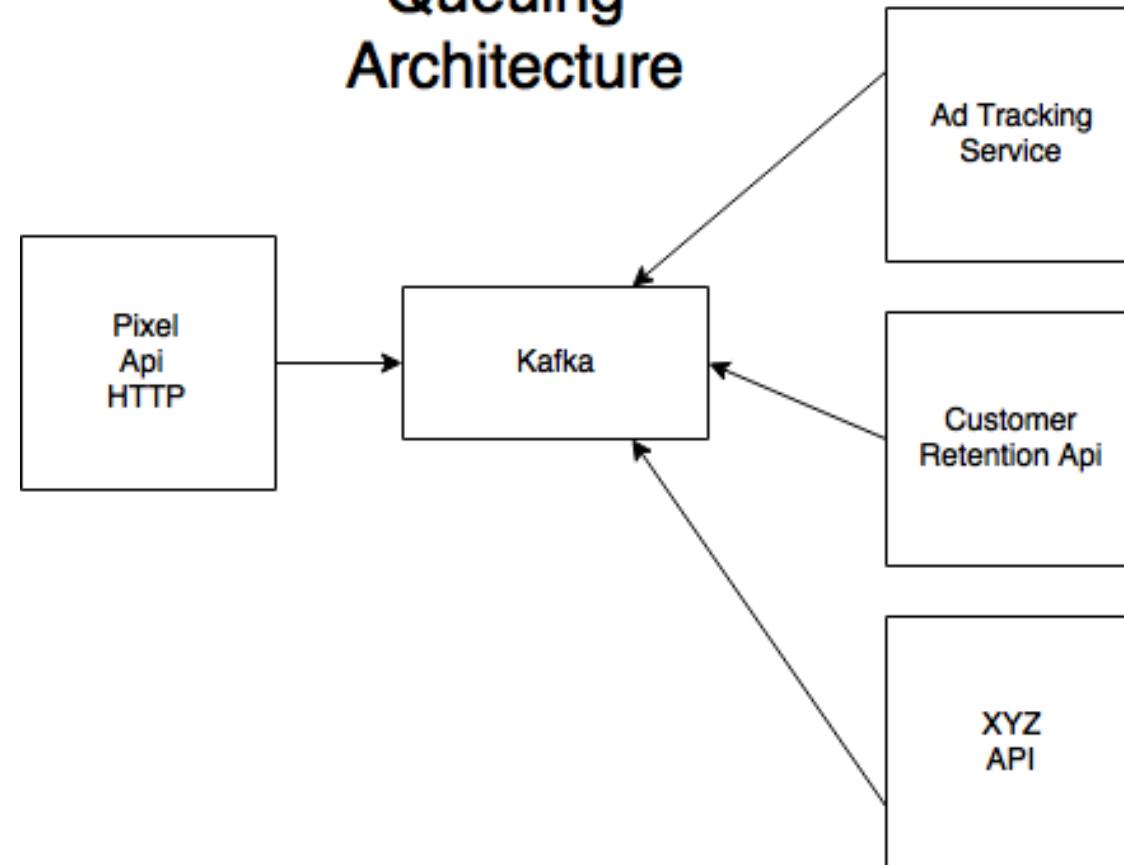
RPC

Message Driven

RPC Architecture



Queuing Architecture



A wide-angle landscape photograph featuring a two-lane asphalt road with a dashed white center line that recedes into the distance. The road is flanked by grassy fields and some sparse vegetation. In the middle ground, a dense line of evergreen trees stretches across the frame. Beyond the trees, a calm body of water, possibly a lake or a wide river, reflects the sky. In the background, a range of rugged mountains with significant snow cover dominates the horizon under a heavy, overcast sky. The overall color palette is muted, with a strong blue-grey tint.

G/RPC

Protobuf definition

```
package helloworld;

// The greeting service definition.
service Greeter {
    // Sends a greeting
    rpc SayHello (HelloRequest) returns (HelloReply) {}
}

// The request message containing the user's name.
message HelloRequest {
    string name = 1;
}

// The response message containing the greetings
message HelloReply {
    string message = 1;
}
```

Go Implementation

```
// server is used to implement helloworld.GreeterServer.  
type server struct{  
  
// SayHello implements helloworld.GreeterServer  
func (s *server) SayHello(ctx context.Context, in *pb>HelloRequest) (*pb>HelloReply, error) {  
    return &pb>HelloReply{Message: "Hello " + in.Name}, nil  
}
```

A blue-tinted photograph of a tree-lined path. The path is covered in fallen leaves and leads towards a distant gate where several people are walking. The trees on either side are dense and their leaves are also blue-tinted.

Forget about config files

Environment variables

```
import "github.com/ianschenck/envflag"  
  
bindAddress := envflag.String(  
    "ADDR",  
    ":8080",  
    "Bind address for the api server")
```

Metrics



Metrics

```
import "github.com/prometheus/client_golang/prometheus"

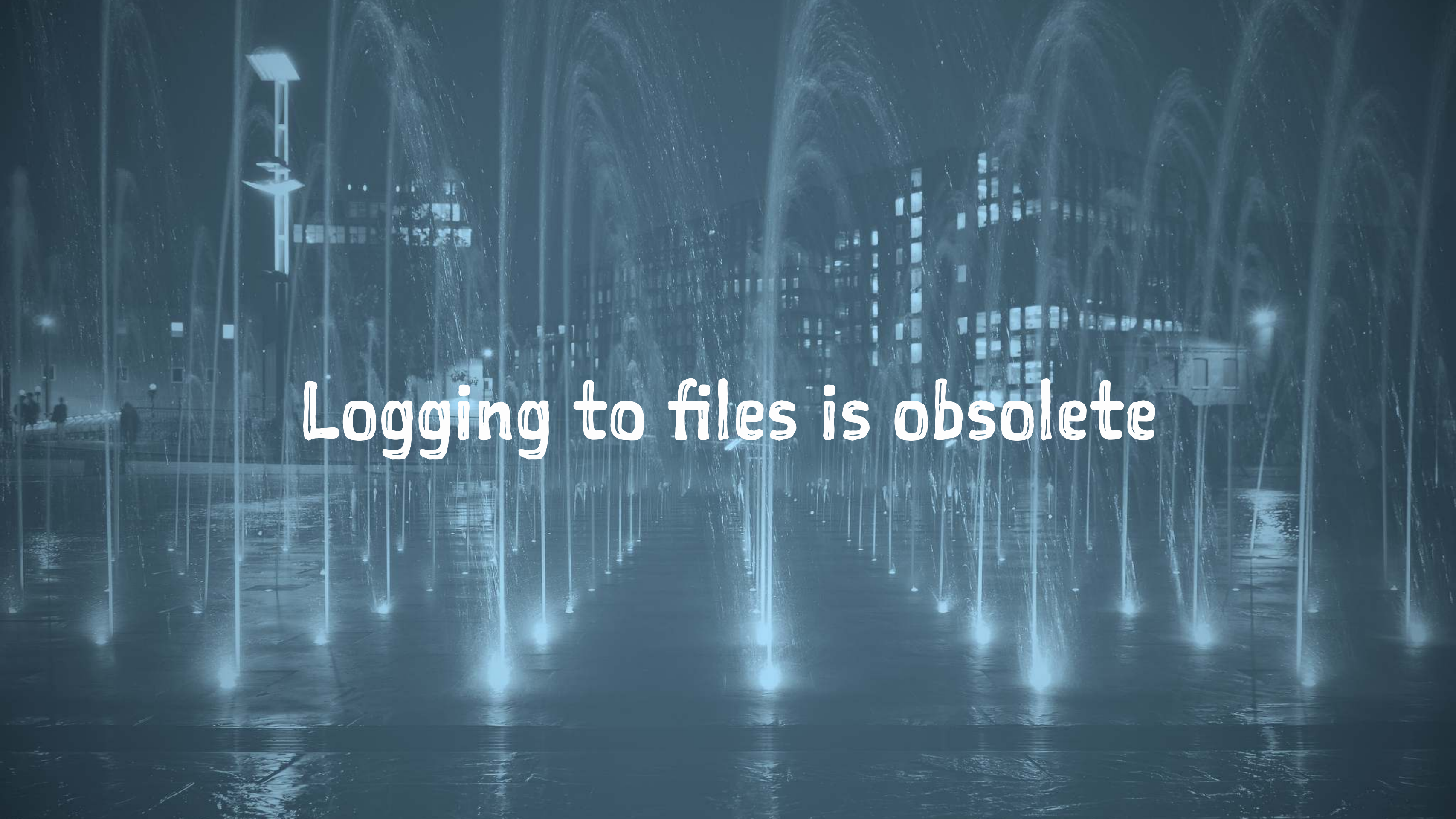
var rpcDurations = prometheus.NewSummaryVec(
    prometheus.SummaryOpts{
        Name:      "rpc_durations_seconds",
        Help:      "RPC latency distributions.",
        Objectives: map[float64]float64{0.5: 0.05, 0.9: 0.01, 0.99: 0.001},
    },
    []string{"service"}

func whatever() {
    start := time.Now()

    //do something

    rpcDurations.Observe(time.Since(start))
}
```





Logging to files is obsolete

REK Stack

- Rsyslog
- Elastic Search
- Kibana

Structured logging

```
{  
  "program": "microservice1", "host": "box01",  
  "log_level": "info", "msg": "Api Request recieved",  
  "user_id": "12345", "rpc_method": "post_add_tick"  
}
```

Logging

```
import log "github.com/Sirupsen/logrus"

func main() {
    log.SetFormatter(&log.JSONFormatter{})

    //Will log to /dev/log
    hook, err := logrus_syslog.NewSyslogHook("", "", syslog.LOG_INFO, "")
    if err != nil {
        log.Error("Unable to connect to local syslog daemon")
    } else {
        log.AddHook(hook)
    }
}
```

+article



+article

700,316 hits

Selected Fields

_source

Fields

Popular fields

agent

bytes

geo.city

geo.coordinates

geo.country_code

@timestamp

_id

_index

_type

creation_time

destination

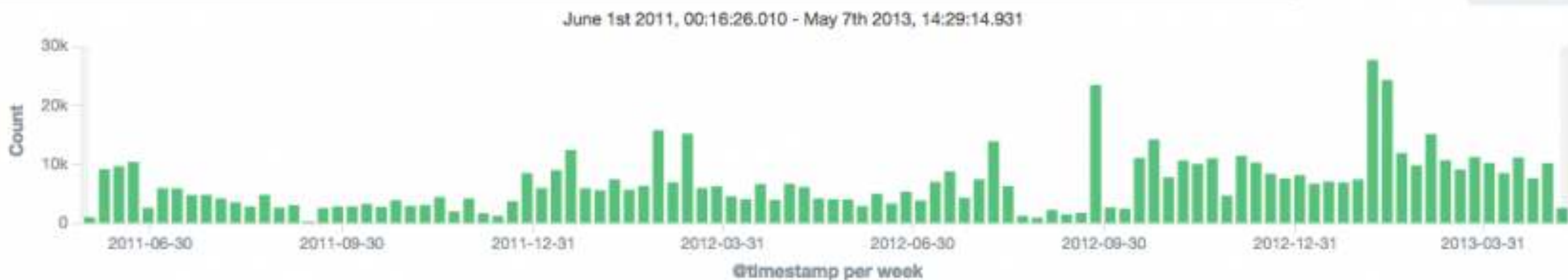
geo.region

referrer

request

timezone

user



Time	_source
May 7th 2013, 14:29:02.000	referrer: http://www.spk.usace.army.mil/Media/NewsReleases/tabid/1034/ Article /13480/corps-releases-inspection-rating-sacramento-river-west-bank-levees.aspx @timestamp: May 7th 2013, 14:29:02.000 creation_time: May 7th 2012, 14:15:25.000 agent: Mozilla/5.0 (Windows NT 6.1; WOW64; rv:20.0) Gecko/20100101 Firefox/20.0 bytes: 379990 geo.country_code: US geo.city: Fort Huachuca geo.region: AZ geo.coordinates: {"lat":31.5273,"lon":-110.360703} timezone: America/Phoenix request: http://bit.ly/JMGCUW destination: http://www.spk.usace.army.mil/M
May 7th 2013, 14:28:50.000	destination: http://www.spk.usace.army.mil/Media/NewsReleases/tabid/1034/ Article /13480/corps-releases-inspection-rating-sacramento-river-west-bank-levees.aspx @timestamp: May 7th 2013, 14:28:50.000 creation_time: May 3rd 2013, 12:01:44.000 agent: Mozilla/5.0 (Windows NT 6.1; WOW64; rv:20.0) Gecko/20100101 Firefox/20.0 bytes: geo.country_code: US geo.city: Fort Huachuca geo.region: AZ geo.coordinates: {"lat":31.5273,"lon":-110.360703} timezone: America/Phoenix request: http://1.usa.gov/18ikFnb user: usacesacramento referrer: direct

Table

JSON

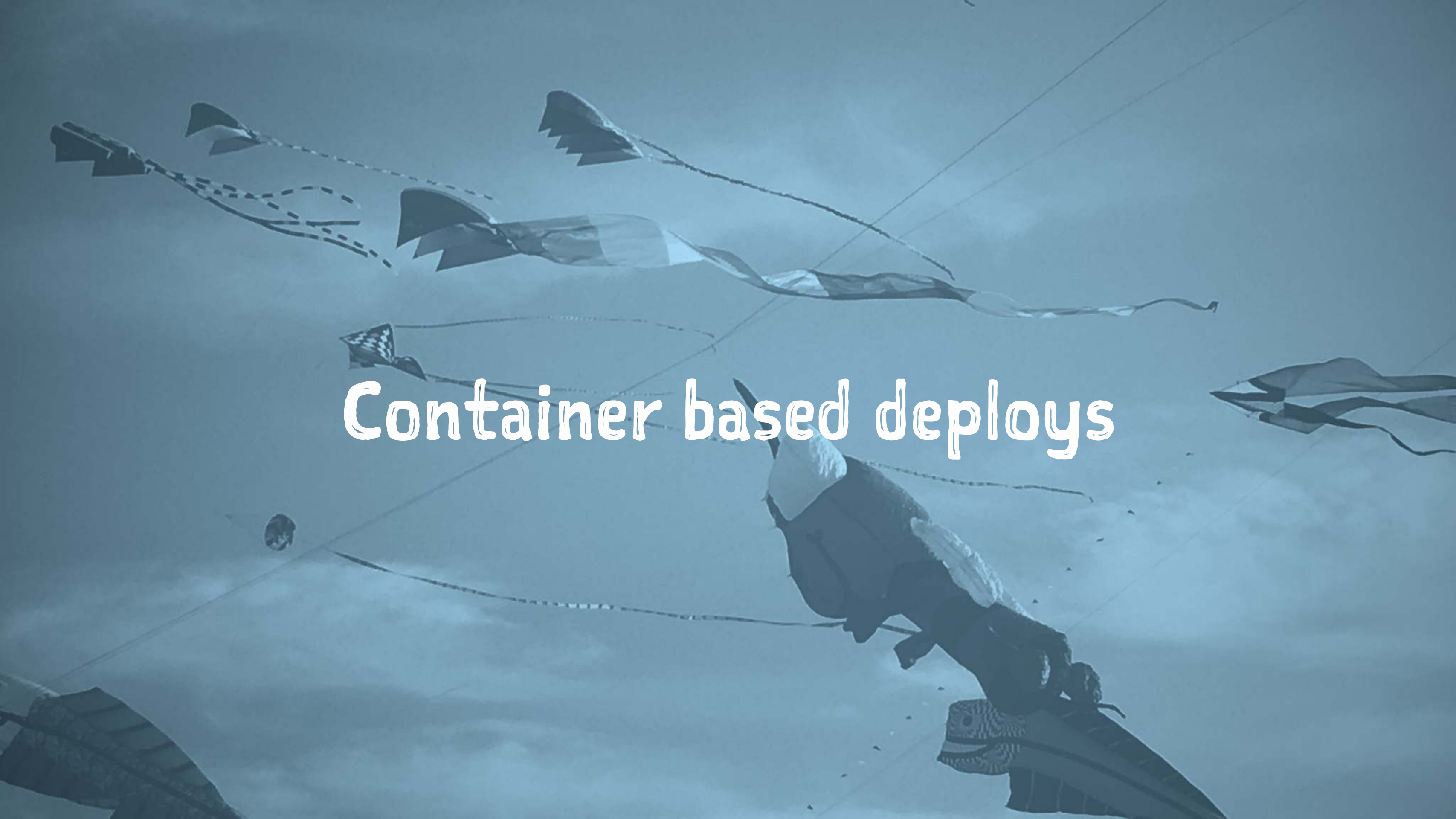
[Link to /usagov/log/AUuEF4d3npiyxElindkv](#)

@timestamp

May 7th 2013, 14:28:50.000

A person is captured mid-jump against a clear blue sky. They are wearing a white t-shirt with a graphic and dark pants. Their arms are raised in a 'V' shape, and their legs are spread wide. A shadow of the person is cast onto the ground below. The text 'Integration tests' is overlaid in a white, monospace-style font.

Integration tests



Container based deploys

Docker file example

```
FROM golang:latest
RUN mkdir /app
ADD . /app/
WORKDIR /app
RUN go build -o main .
CMD ["/app/main"]
```

Docker build

```
docker build -t myapp:version .
```

Docker Run

```
docker run -V /dev/log:/dev/log -E=addr=:8080 myapp:version
```

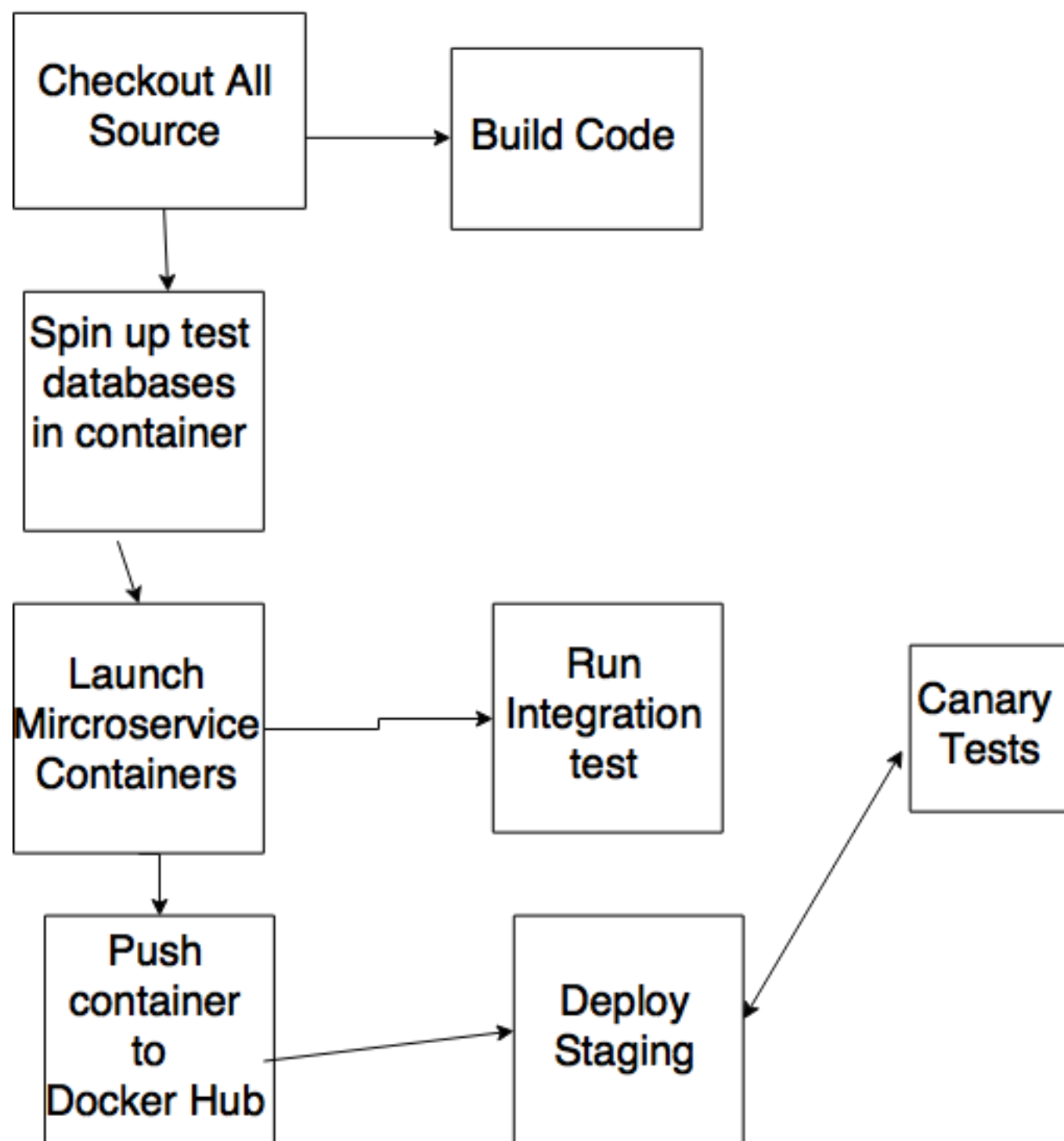
Breakdown

- Syslog -> -V /dev/log:/devlog
- ENV Vars -> -E addr=:8080
- Application container -> myapp:version

Continuous Integration

The background of the slide is a dark, atmospheric photograph. It shows a sky filled with heavy, textured clouds in shades of blue and grey. In the lower portion of the image, the silhouettes of bare trees and a distant horizon line are visible against the lighter sky.

CI Workflow





Ansible + Docker

Kubernetes

A blue-tinted photograph of a brick building with laundry hanging on a line. A sign hanging from the line reads "FAIL".

Why is Go the future of microservices?



Questions?