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CONSUL API & AUTOMATED SCALING

Concepts and Application

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Automated Scaling

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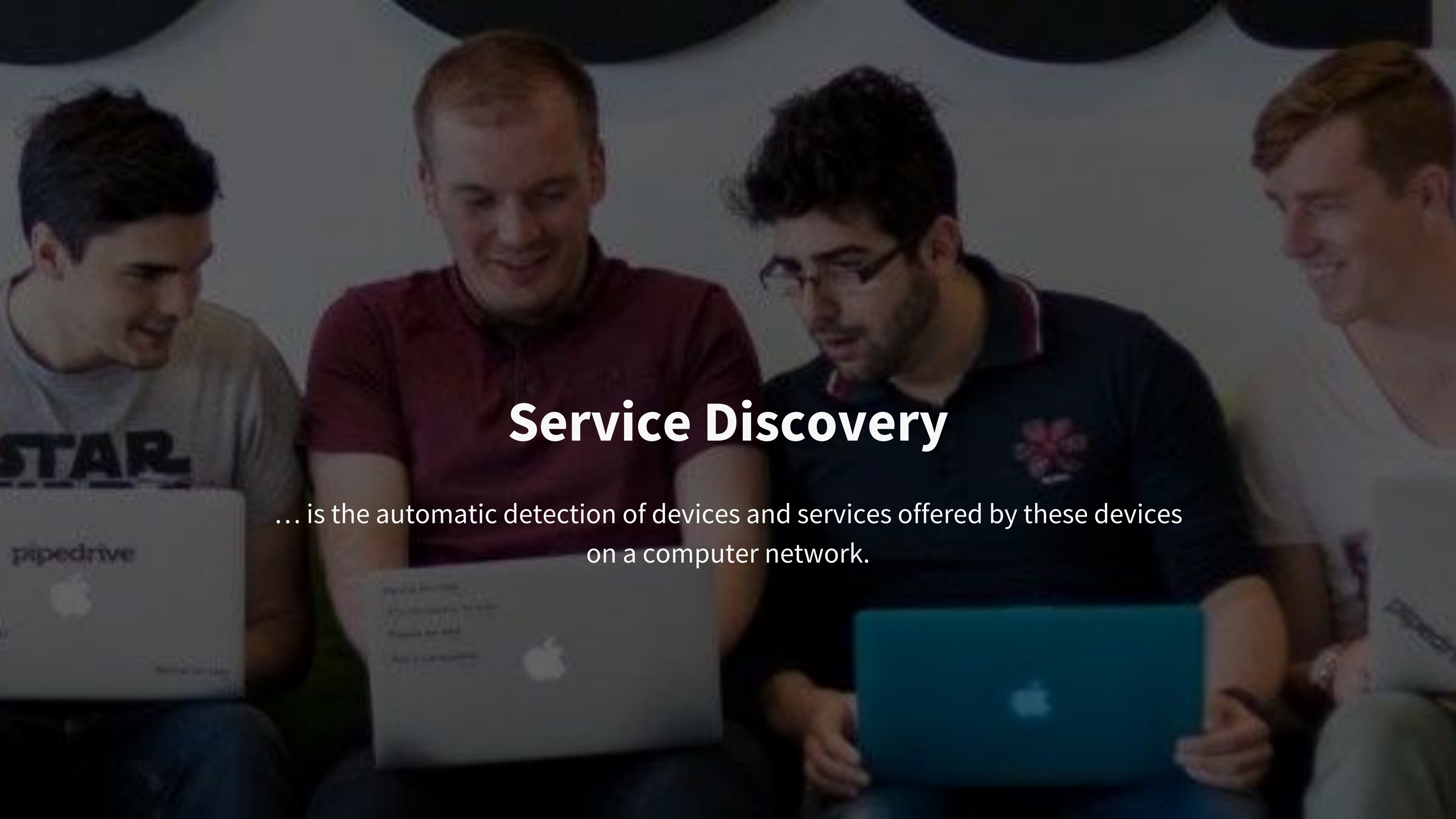


Service Discovery

… is the automatic detection of devices and services offered by these devices on a computer network.

Introduction to Service Discovery

The concept around service discovery is that each new service instance is able to declare itself to a service discovery service.

Service discovery involves 3 parties: service provider, service consumer and service registry.

service provider registers itself with service registry when it enters and deregister itself when it leaves the system;

service consumer gets the location of a provider from registry, and then talks to the provider;

service registry maintains the latest location of providers;

Introduction to Service Discovery

Client-side discovery or Server-side discovery ?

Client-side discovery: service consumer keep all locations of providers and load balance the requests across locations.

Pros: registry is the only one more component.

Cons: need client for different languages/frameworks used in your system.

Server-side discovery: consumer send requests to a load balancer, the load balancer query from registry and decide which location of providers to send to.

Pros: language/ framework agnostic.

Cons: now you need to manage another moving part—the load balancer.

Introduction to Service Discovery

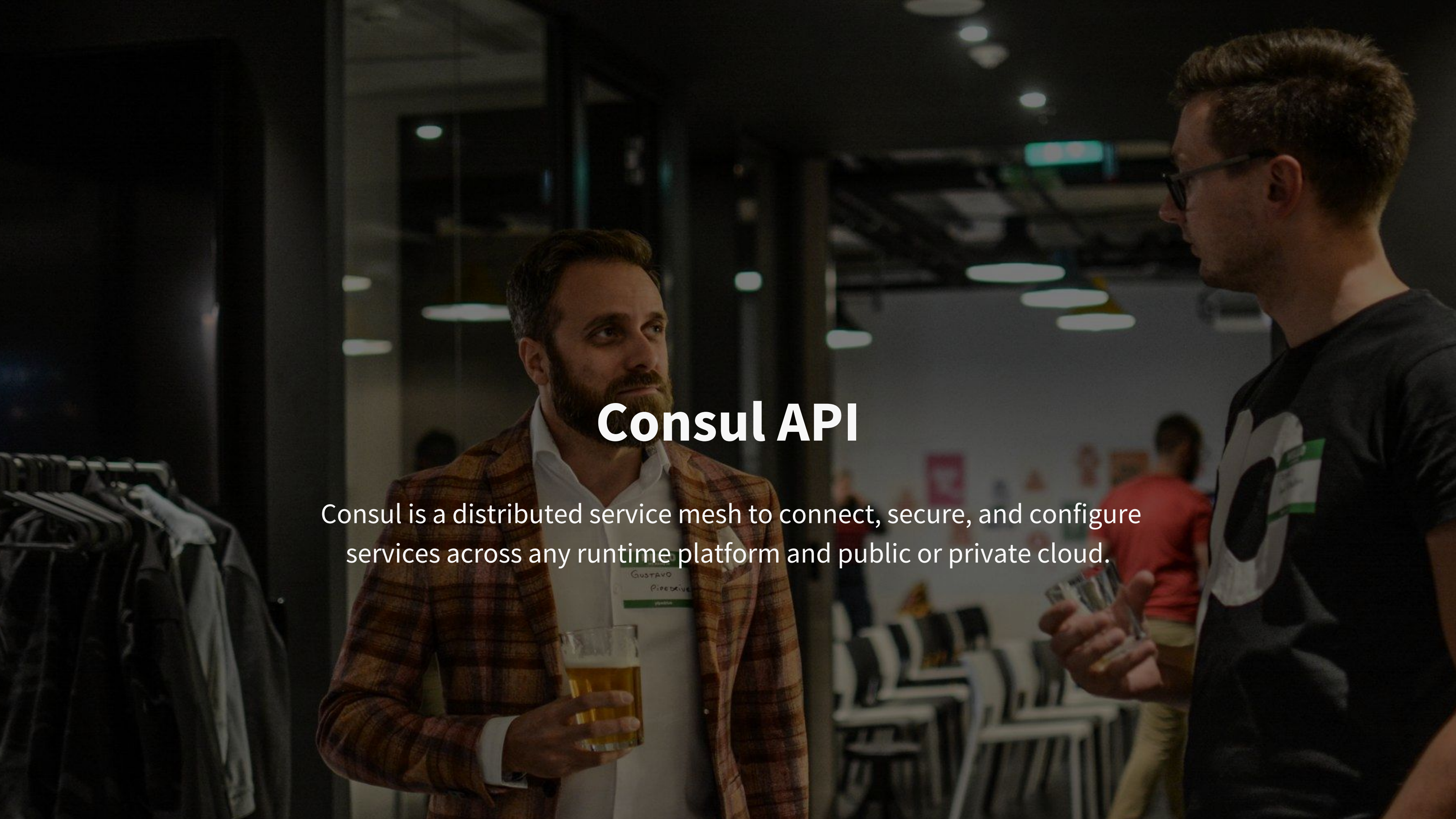
Ideally each instance of a service will have its own health status, so service discovery can remove unhealthy instances from service discovery service.

The health check is a mandatory feature to allow graceful shutdown of service instances during deploy and migration tasks.

A service pool should have 2 instances minimum to assure service redundancy, assuming that during deploys a single instance is replaced at a time, in large services we can shutdown multiple instances at once.

Service Discovery Benefits

- Centralized Information used by all;
- Allows horizontal scaling of each service;
- Makes easier to use managed cloud infrastructures, where a config file cannot do the job and the machines are not physical and can change often;
- Makes easier to use non-default ports;



Consul API

Consul is a distributed service mesh to connect, secure, and configure services across any runtime platform and public or private cloud.

Consul API

KV Store (https://www.consul.io/api/kv.html)

Check also consul client (‘consul kv put key value’)

Create/Update Key	Get Key
curl --request PUT --data myawsomeproject.com \ http://127.0.0.1:8500/v1/kv/myservice/domain/name true	curl http://127.0.0.1:8500/v1/kv/myservice/domain/name [?raw=true] [{ "LockIndex": 0, "Key": "domain", "Flags": 0, "Value": "bXlhd3NvbWVwcm9qZWN0LmNvbQ==", "CreateIndex": 1810, "ModifyIndex": 1810}]
Delete Key	**Get All Keys on a path**
curl --request DELETE \ http://127.0.0.1:8500/v1/kv/myservice?recurse=true true	curl http://127.0.0.1:8500/v1/kv/myservice?keys ["myservice/domain/name"]

Consul API

Transactions (https://www.consul.io/api/txn.html)

Can perform up to 64 operations in a single request

Get all keys on a path

```
curl --request PUT --data '[{"KV":{"Verb":"get-tree","Key":"myservice"}}]' http://127.0.0.1:8500/v1/txn
{       "Results": [{
                "KV": {
                        "LockIndex": 0,
                        "Key": "myservice/domain/name",
                        "Flags": 0,
                        "Value": "bXlhd3NvbWVwcm9qZWN0LmNvbQ==",
                        "CreateIndex": 116,
                        "ModifyIndex": 116
        }}],
        "Errors": null,
        (...)
}
```

Consul API

Services (https://www.consul.io/api/agent/service.html)

Can also be done via consul agent

List Services

```
curl http://127.0.0.1:8500/v1/agent/services
{
        "microservice1": {
                "ID": "microservice1",
                "Service": "hello-service",
                "Tags": ["public-route","nginx"],
        "Meta": {"nginx": "1.15.8"},
        "Address": "172.17.0.9", "Port": 8080,
        "Weights": {"Passing": 1, "Warning": 1},
        "EnableTagOverride": true
        }
}
```

Consul API

Services (https://www.consul.io/api/agent/service.html)

Can also be done via consul agent

Register a Service

```
curl --request PUT --data '{
        "ID": "some-container-id",
        "Name": "some-service",
        "Tags": [
                "public-route",
                "nginx"
        ],
        "Address": "172.17.0.10",
        "Port": 8080,
        "Meta": {
                "nginx": "1.15.8"
        },
        "EnableTagOverride": true}' http://127.0.0.1:8500/v1/agent/service/register
```

Consul API

Services (https://www.consul.io/api/agent/service.html)

Can also be done via consul agent

Deregister a Service

```
curl --request PUT \
          http://127.0.0.1:8500/v1/agent/service/deregister/my-service-id
```

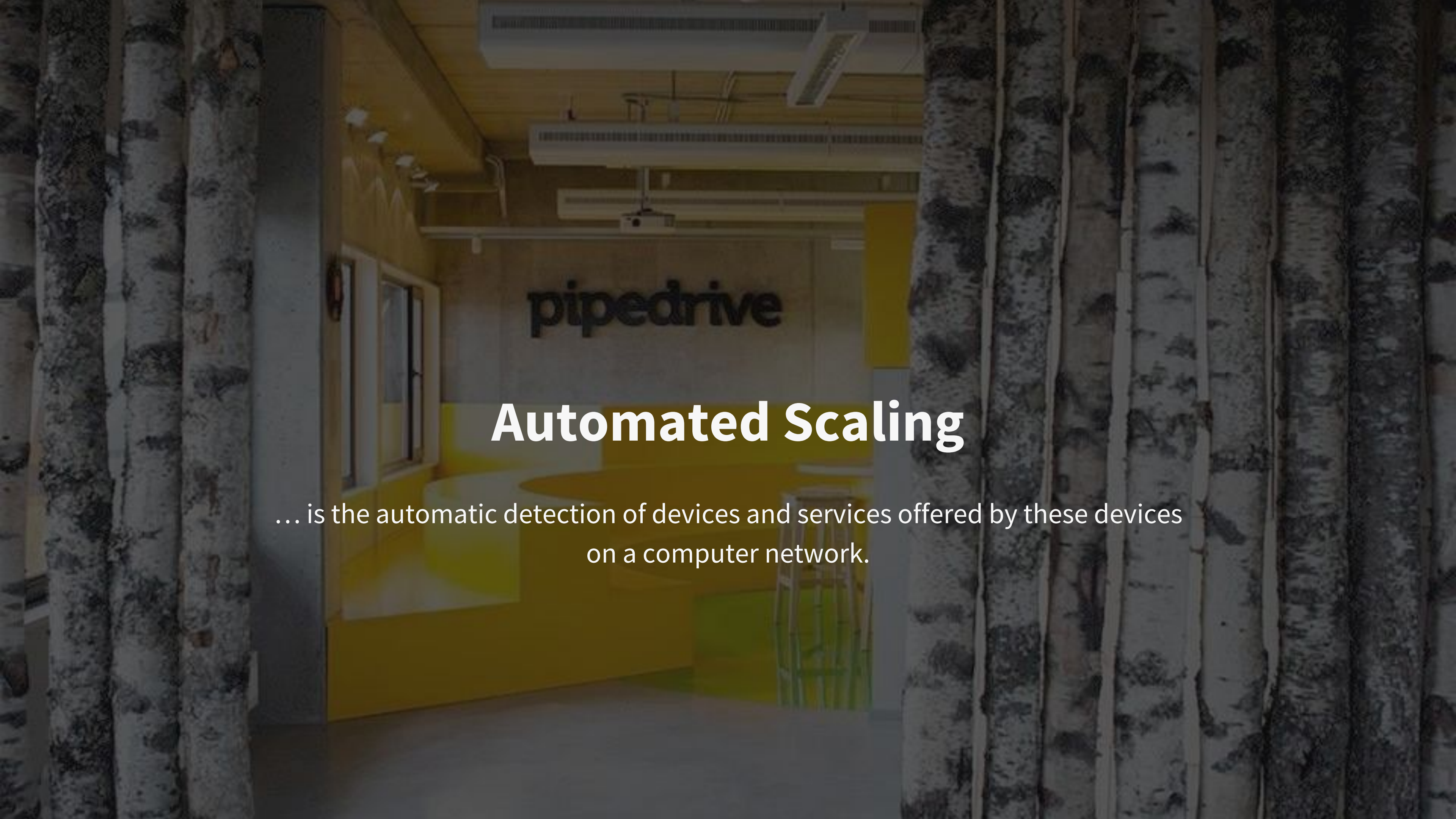
Consul API

Services (https://www.consul.io/api/agent/service.html)

Can also be done via consul agent

Obtain a Service Details

```
curl http://localhost:8500/v1/agent/service/microservice1
{
            "ID": "microservice1",
            "Service": "hello-service",
            "Tags": ["public-route","nginx"],
            "Meta": {"nginx": "1.15.8"},
            "Port": 8080, "Address": "172.17.0.9",
            "Weights": {"Passing": 1,"Warning": 1},
            "EnableTagOverride": true,
            "ContentHash": "769f4ebf0ba81c1f"
}
```



Automated Scaling

… is the automatic detection of devices and services offered by these devices on a computer network.

Setting up an infrastructure for this demo

Demo

Let Magic Happen

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Links

This presentation video: https://www.youtube.com/watch?v=JGgPb0nYahA

https://github.com/nelsongomes/consul-api-scaling code of the demo

https://www.consul.io/ - consul

https://github.com/hashicorp/consul-template - consul template

http://gliderlabs.github.io/registrator/latest/ - to automate service registration on consul (not demoed)

https://hub.docker.com/_/nginx nginx docker image

https://hub.docker.com/_/consul consul docker image

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Thank you.

Any questions? Email me at nelson.gomes@pipedrive.com

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