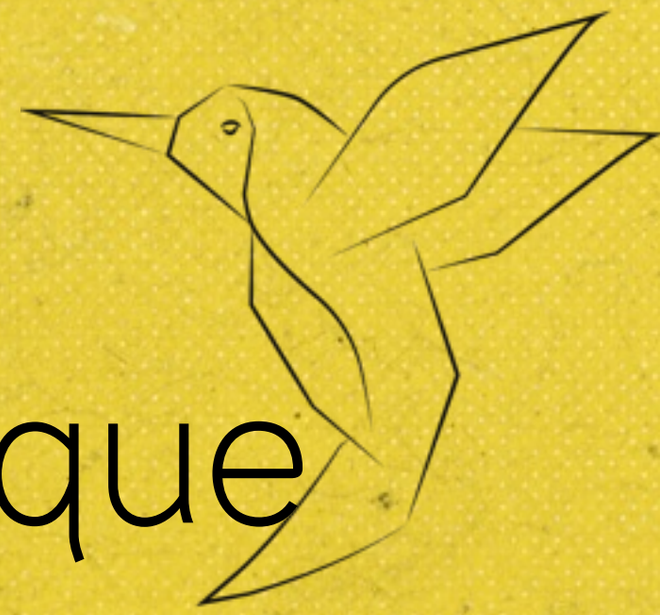

Introduction Pratique à CoreOS et Terraform

Pour les développeurs

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@squarescale.com

@_crev_
eunomie

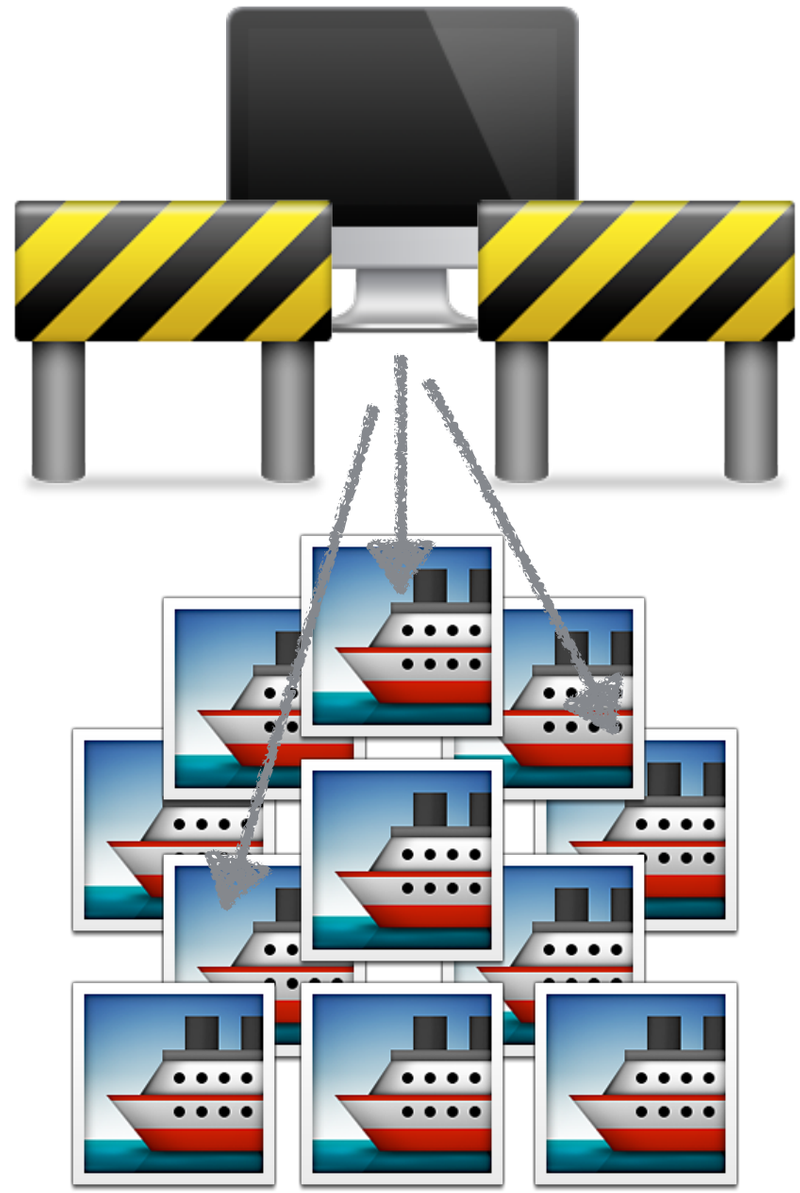
Human Talks Grenoble
08/11/2016

Introduction Pratique

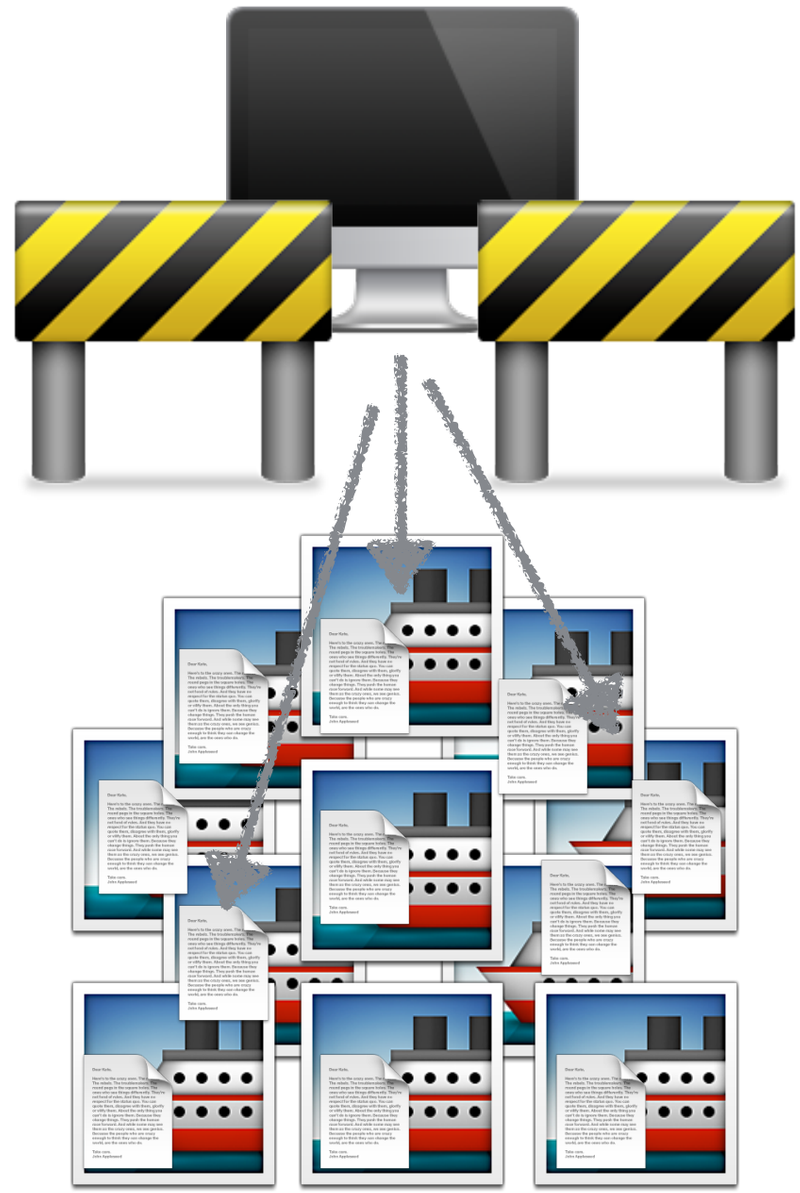
Par l'exemple

Problème ?

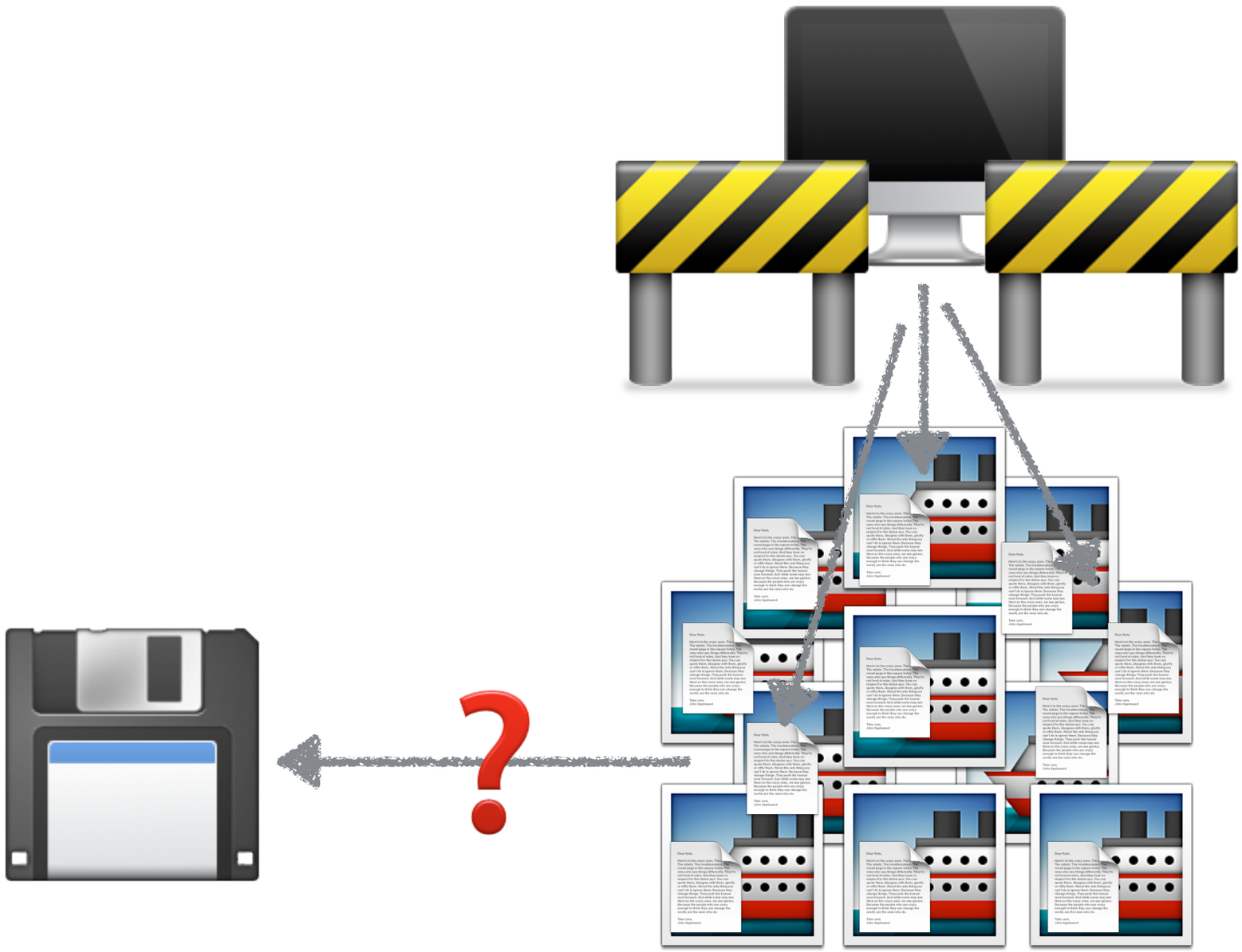
Problème ?



Problème ?



Problème ?



elasticsearch

Besoin

Installer ElasticSearch

Besoin

Installer ElasticSearch

??

https://www.elastic.co/guide/en/elasticsearch/reference/current/_installation.html

https://www.elastic.co/guide/en/elasticsearch/reference/current/_installation.html

```
$ curl -L -O https://artifacts.elastic.co/
downloads/elasticsearch/
elasticsearch-5.0.0.tar.gz

$ tar -xvf elasticsearch-5.0.0.tar.gz

$ cd elasticsearch-5.0.0/bin

$ ./elasticsearch
```

https://www.elastic.co/guide/en/elasticsearch/reference/current/_installation.html

```
$ curl -L -O https://artifacts.elastic.co/
downloads/elasticsearch/
elasticsearch-5.0.0.tar.gz

$ tar -xvf elasticsearch-5.0.0.tar.gz

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https://www.elastic.co/guide/en/elasticsearch/reference/current/_installation.html

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downloads/elasticsearch/
elasticsearch-5.0.0.tar.gz

$ tar -xvf elasticsearch-5.0.0.tar.gz

$ cd elasticsearch-5.0.0/bin

$ ./elasticsearch
```

Où ?

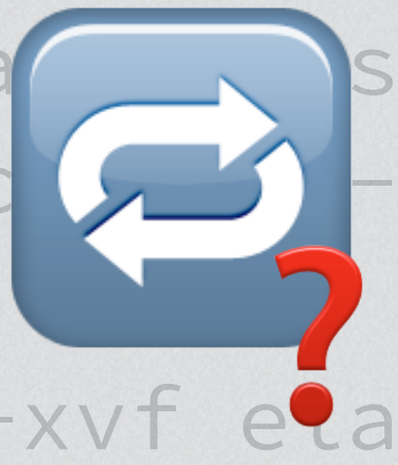
https://www.elastic.co/guide/en/elasticsearch/reference/current/_installation.html

```
$ curl -L -O https://artifacts.elastic.co/
downloa                sticsearch/
elastic                -5.0.0.tar.gz

$ tar -xvf elasticsearch-5.0.0.tar.gz

$ cd elasticsearch-5.0.0/bin

$ ./elasticsearch
```



Répétabilité ?

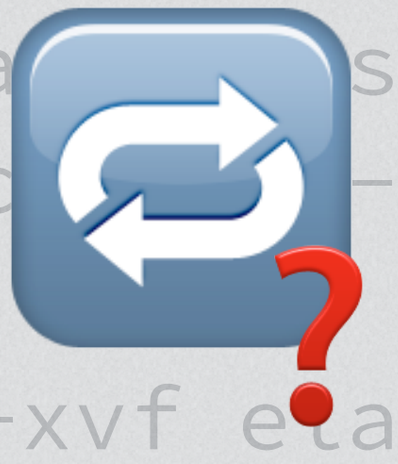
https://www.elastic.co/guide/en/elasticsearch/reference/current/_installation.html

```
$ curl -L -O https://artifacts.elastic.co/
downloa                sticsearch/
elastic                -5.0.0.tar.gz

$ tar -xvf elasticsearch-5.0.0.tar.gz

$ cd elasticsearch-5.0.0/bin

$ ./elasticsearch
```



Scale ?

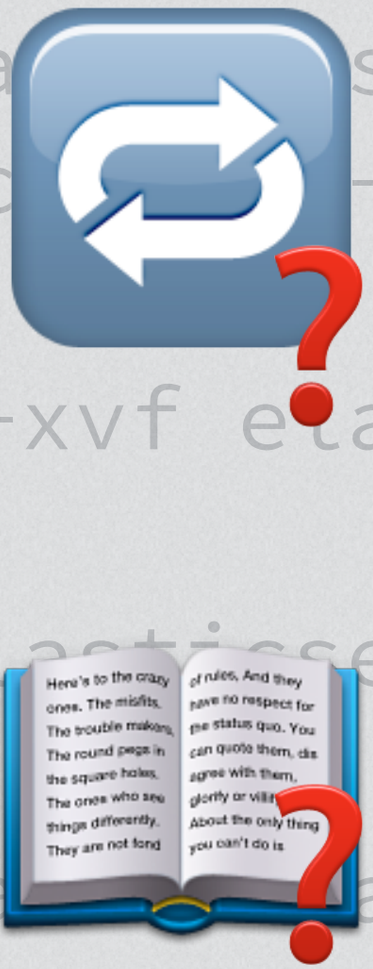
https://www.elastic.co/guide/en/elasticsearch/reference/current/_installation.html

```
$ curl -L -O https://artifacts.elastic.co/
downloa                sticsearch/
elastic                -5.0.0.tar.gz

$ tar -xvf elasticsearch-5.0.0.tar.gz

$ cd elasticsearch-5.0.0/bin

$ ./ela                arch
```



Documentation ?

Quelles solutions ?

- Infrastructure
- Applicatif

Quelles solutions ?

- Infrastructure
- Applicatif

Terraform.io

WRITE, PLAN, AND CREATE INFRASTRUCTURE AS CODE

```
resource "aws_instance" "elasticsearch" {

}
```

```
resource "aws_instance" "elasticsearch" {

}
```

Type de ressource :
Instance Amazon Web Service (EC2)

```
resource "aws_instance" "elasticsearch" {

}
```

Nom de la ressource

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

}
```

Instance Amazon Web Service (EC2)

Taille : t2.micro -> 1 VCPU, 1Go RAM

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"
```

Amazon Machine Image

```
}
```

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"

}
```

CoreOS 1185.3.0

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"

  associate_public_ip_address = true



}
```

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"

  associate_public_ip_address = true

  subnet_id = "subnet-6f6f2919"

}
```

Réseau local

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"

  associate_public_ip_address = true

  subnet_id = "subnet-6f6f2919"

  vpc_security_group_ids = ["${aws_security_group.base_sg.id}"]
}
```

± Firewall

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"

  associate_public_ip_address = true

  subnet_id = "subnet-6f6f2919"

  vpc_security_group_ids = ["${aws_security_group.base_sg.id}"]

}
```

Port 22 + Ping + sortie

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"

  associate_public_ip_address = true

  subnet_id = "subnet-6f6f2919"

  vpc_security_group_ids = ["${aws_security_group.base_sg.id}"]

  key_name = "${aws_key_pair.admin_key.key_name}"
}
```

Clé SSH

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"

  associate_public_ip_address = true

  subnet_id = "subnet-6f6f2919"

  vpc_security_group_ids = ["${aws_security_group.base_sg.id}"]

  key_name = "${aws_key_pair.admin_key.key_name}"

}
```

Quelles solutions ?

- Infrastructure
- Applicatif

Quelles solutions ?

- Infrastructure OK
- Applicatif

Quelles solutions ?

- Infrastructure 🆗
- Applicatif

https://www.elastic.co/guide/en/elasticsearch/reference/current/_installation.html

```
$ curl -L -O https://artifacts.elastic.co/
downloads/elasticsearch/
elasticsearch-5.0.0.tar.gz

$ tar -xvf elasticsearch-5.0.0.tar.gz

$ cd elasticsearch-5.0.0/bin

$ ./elasticsearch
```

https://www.elastic.co/guide/en/elasticsearch/reference/current/_installation.html

```
$ curl -L -O https://artifacts.elastic.co/
downloads/elasticsearch/
elasticsearch-5.0.0.tar.gz

$ tar -xvf elasticsearch-5.0.0.tar.gz

$ cd elasticsearch-5.0.0/bin

$ ./elasticsearch
```

https://store.docker.com/images/1090e442-627e-4bf2-b29a-555f57a64ecd

https://store.docker.com/images/1090e442-627e-4bf2-b29a-555f57a64ecd

```
$ docker run -d elasticsearch
```

CoreOS.com

CoreOS

CoreOS.com

Distribution Linux légère

CoreOS.com

Distribution Linux légère
Pas de gestionnaire de paquet

CoreOS.com

Distribution Linux légère
Pas de gestionnaire de paquet
Cluster

CoreOS.com

Distribution Linux légère
Pas de gestionnaire de paquet
Cluster
Containers

CoreOS – Terraform

CoreOS – Terraform

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"

  associate_public_ip_address = true

  subnet_id = "subnet-6f6f2919"

  vpc_security_group_ids = ["${aws_security_group.base_sg.id}"]

  key_name = "${aws_key_pair.admin_key.key_name}"


}
```

CoreOS – Terraform

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"

  associate_public_ip_address = true

  subnet_id = "subnet-6f6f2919"

  vpc_security_group_ids = ["${aws_security_group.base_sg.id}"]

  key_name = "${aws_key_pair.admin_key.key_name}"

  user_data = "${file("cloud-config/elasticsearch.yml")}"

}
```

CoreOS – Terraform

```
#cloud-config
```

CoreOS – Terraform

```
#cloud-config
```

Header (autre choix : #! pour shell)

CoreOS – Terraform

```
#cloud-config
coreos:
  units:
```

Ensemble d'units Systemd

CoreOS – Terraform

```
#cloud-config
coreos:
  units:
    - name: elasticsearch.service
      command: start
      content: |
```

CoreOS – Terraform

```
#cloud-config
coreos:
  units:
    - name: elasticsearch.service
      command: start
      content: |
        [Unit]
        Description=Elastic Search
```

CoreOS – Terraform

```
#cloud-config
coreos:
  units:
    - name: elasticsearch.service
      command: start
      content: |
        [Unit]
        Description=Elastic Search
        After=docker.service
        Requires=docker.service
```

CoreOS – Terraform

```
#cloud-config
coreos:
  units:
    - name: elasticsearch.service
      command: start
      content: |
        [Unit]
        Description=Elastic Search
        After=docker.service
        Requires=docker.service
        [Service]
        Restart=always
```

CoreOS – Terraform

```
#cloud-config
coreos:
  units:
    - name: elasticsearch.service
      command: start
      content: |
        [Unit]
        Description=Elastic Search
        After=docker.service
        Requires=docker.service
        [Service]
        Restart=always
        ExecStartPre=-/usr/bin/docker kill elasticsearch
        ExecStartPre=-/usr/bin/docker pull elasticsearch:2.4
```

CoreOS – Terraform

```
#cloud-config
coreos:
  units:
    - name: elasticsearch.service
      command: start
      content: |
        [Unit]
        Description=Elastic Search
        After=docker.service
        Requires=docker.service
        [Service]
        Restart=always
        ExecStartPre=-/usr/bin/docker kill elasticsearch
        ExecStartPre=-/usr/bin/docker pull elasticsearch:2.4
        ExecStart=/usr/bin/docker run --rm --hostname elasticsearch
          --name elasticsearch -p 9200:9200 elasticsearch:2.4
```

CoreOS – Terraform

```
#cloud-config
coreos:
  units:
    - name: elasticsearch.service
      command: start
      content: |
        [Unit]
        Description=Elastic Search
        After=docker.service
        Requires=docker.service
        [Service]
        Restart=always
        ExecStartPre=-/usr/bin/docker kill elasticsearch
        ExecStartPre=-/usr/bin/docker pull elasticsearch:2.4
        ExecStart=/usr/bin/docker run --rm --hostname elasticsearch
          --name elasticsearch -p 9200:9200 elasticsearch:2.4
        ExecStop=/usr/bin/docker stop elasticsearch
```

CoreOS – Terraform

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"

  associate_public_ip_address = true

  subnet_id = "subnet-6f6f2919"

  vpc_security_group_ids = ["${aws_security_group.base_sg.id}"]


  key_name = "${aws_key_pair.admin_key.key_name}"

  user_data = "${file("cloud-config/elasticsearch.yml")}"

}
```

CoreOS – Terraform

```
resource "aws_instance" "elasticsearch" {

  instance_type = "t2.micro"

  ami = "ami-7ddc960e"

  associate_public_ip_address = true

  subnet_id = "subnet-6f6f2919"

  vpc_security_group_ids = ["${aws_security_group.base_sg.id}",
                            "${aws_security_group.elasticsearch_sg.id}"]

  key_name = "${aws_key_pair.admin_key.key_name}"

  user_data = "${file("cloud-config/elasticsearch.yml")}"

}
```

Port 9200

Quelles solutions ?

- Infrastructure 🆗
- Applicatif

Quelles solutions ?

- Infrastructure 🆗
- Applicatif 🆗

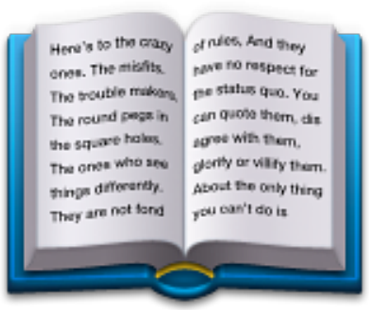
Quelles solutions ?

- Infrastructure 
- Applicatif 

Quelles solutions ?

- Infrastructure OK
- Applicatif OK

CoreOS

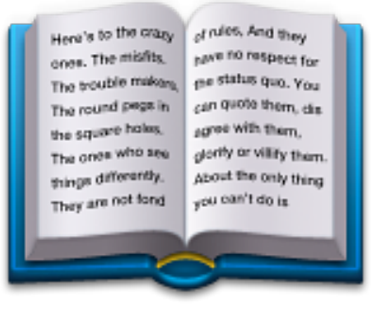


Doc : Code

Quelles solutions ?

- Infrastructure 
- Applicatif 

CoreOS



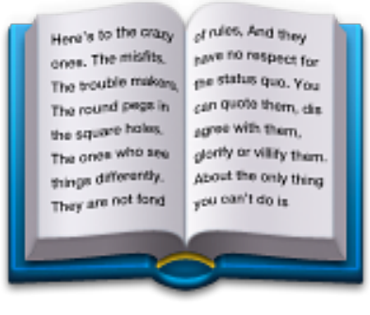
Répétable

Quelles solutions ?

- Infrastructure

- Applicatif

CoreOS



Serveur géré

Quelles solutions ?

- Infrastructure
- Applicatif

CoreOS

Configurable

```
resource "aws_instance" "elasticsearch" {
  instance_type = "t2.micro"
  ami = "ami-7ddc960e"
  associate_public_ip_address = true
  subnet_id = "subnet-6f6f2919"
  vpc_security_group_ids =
   ["${aws_security_group.base_sg.id}",
    "${aws_security_group.elasticsearch_sg.id}"]
  key_name =
    "${aws_key_pair.admin_key.key_name}"
  user_data =
    "${file("cloud-config/elasticsearch.yml")}"
}
resource "aws_security_group" "base_sg" {
  name        = "base_sg"
  vpc_id      = "vpc-b89ee9dc"
  ingress {
    from_port   = 22
    to_port     = 22
    protocol    = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
  }
  ingress {
    from_port   = 8
    to_port     = -1
    protocol    = "icmp"
    cidr_blocks = ["0.0.0.0/0"]
  }
  egress {
    from_port   = 0
    to_port     = 0
    protocol    = "-1"
    cidr_blocks = ["0.0.0.0/0"]
  }
}
resource "aws_security_group" "elasticsearch_sg" {
  name        = "elasticsearch_sg"
  vpc_id      = "vpc-b89ee9dc"
  ingress {
    from_port   = 9200
    to_port     = 9200
    protocol    = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
  }
}
```

```
#cloud-config
coreos:
  units:
    - name: elasticsearch.service
      command: start
      content: |
        [Unit]
        Description=Elastic Search
        After=docker.service
        Requires=docker.service
        [Service]
        Restart=always
        ExecStartPre=-/usr/bin/docker kill
elasticsearch
        ExecStartPre=-/usr/bin/docker pull
elasticsearch:2.4
        ExecStart=/usr/bin/docker run --rm --
hostname elasticsearch --name elasticsearch -p
9200:9200 elasticsearch:2.4
        ExecStop=/usr/bin/docker stop
elasticsearch
```

```
variable "aws_access_key" {}
variable "aws_secret_key" {}
variable "aws_region" {
  default     = "eu-west-1"
}
provider "aws" {
  access_key = "${var.aws_access_key}"
  secret_key = "${var.aws_secret_key}"
  region     = "${var.aws_region}"
}
```

```
resource "aws_instance" "elasticsearch" {
  instance_type = "t2.micro"
  ami = "ami-7ddc960e"
  associate_public_ip_address = true
  subnet_id = "subnet-6f6f2919"
  vpc_security_group_ids =
   ["${aws_security_group.base_sg.id}",
    "${aws_security_group.elasticsearch_sg.id}"]
  key_name =
    "${aws_key_pair.admin_key.key_name}"
  user_data =
    "${file("cloud-config/elasticsearch.yml")}"
}
resource "aws_security_group" "base_sg" {
  name        = "base_sg"
  vpc_id      = "vpc-b89ee9dc"
  ingress {
    from_port   = 22
    to_port     = 22
    protocol    = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
  }
  ingress {
    from_port   = 8
    to_port     = -1
    protocol    = "icmp"
    cidr_blocks = ["0.0.0.0/0"]
  }
  egress {
    from_port   = 0
    to_port     = 0
    protocol    = "-1"
    cidr_blocks = ["0.0.0.0/0"]
  }
}
resource "aws_security_group" "elasticsearch_sg" {
  name        = "elasticsearch_sg"
  vpc_id      = "vpc-b89ee9dc"
  ingress {
    from_port   = 9200
    to_port     = 9200
    protocol    = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
  }
}
```

```
#cloud-config
coreos:
  units:
    - name: elasticsearch.service
      command: start
      content: |
        [Unit]
        Description=Elastic Search
        After=docker.service
        Requires=docker.service
        [Service]
        Restart=always
        ExecStartPre=-/usr/bin/docker kill
elasticsearch
        ExecStartPre=-/usr/bin/docker pull
elasticsearch:2.4
        ExecStart=/usr/bin/docker run --rm --
hostname elasticsearch --name elasticsearch -p
9200:9200 elasticsearch:2.4
        ExecStop=/usr/bin/docker stop
elasticsearch
```

```
variable "aws_access_key" {}
variable "aws_secret_key" {}
variable "aws_region" {
  default     = "eu-west-1"
}
provider "aws" {
  access_key = "${var.aws_access_key}"
  secret_key = "${var.aws_secret_key}"
  region     = "${var.aws_region}"
}
```

terraform.io

coreos.com

speakerdeck.com/eunomie

github.com/eunomie