Infrastructure as Code (IAC)

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Sobre

- Formado em Ciência da Computação em 2005
- Mestre em Engenharia da Computação em 2014
- Sysadmin Linux há 10 anos
- LPI1 / LPI2
- Zabbix Certified Specialist / Zabbix for Large Environments
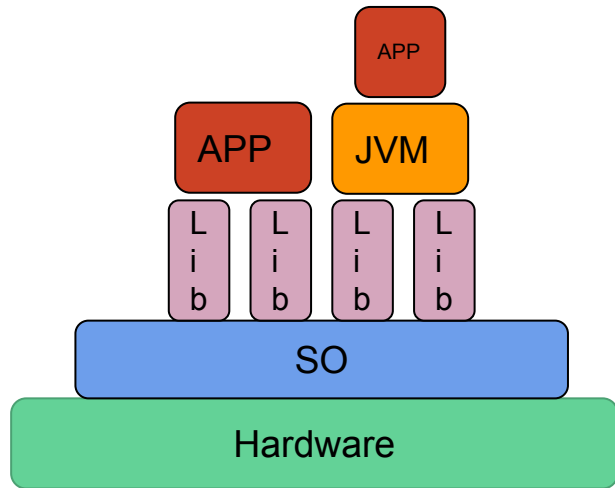- Entusiasta de tecnologias open source

IAC - Princípios *

- Reproducibility
- Consistency
- **Repeatability**
- **Disposability**

- Service continuity
- Self-testing systems
- **Self-documenting systems**
- Small changes
- **Version all the things**

*Kief Morrys

IAC - A base

Abstração

IAC - Exemplos de abstração

APP

APP | JVM

Lib | Lib | Lib | Lib

SO

Hardware

- x86 ou ARM?
- Android ou IOS?
- Navegador?

* se padronizada gera independência total das camadas inferiores

IAC - Timeline

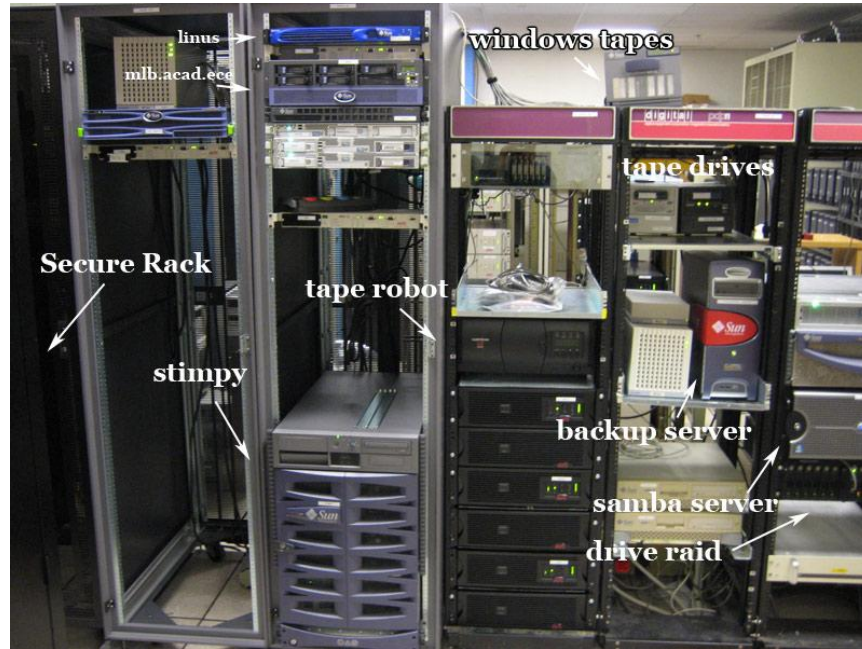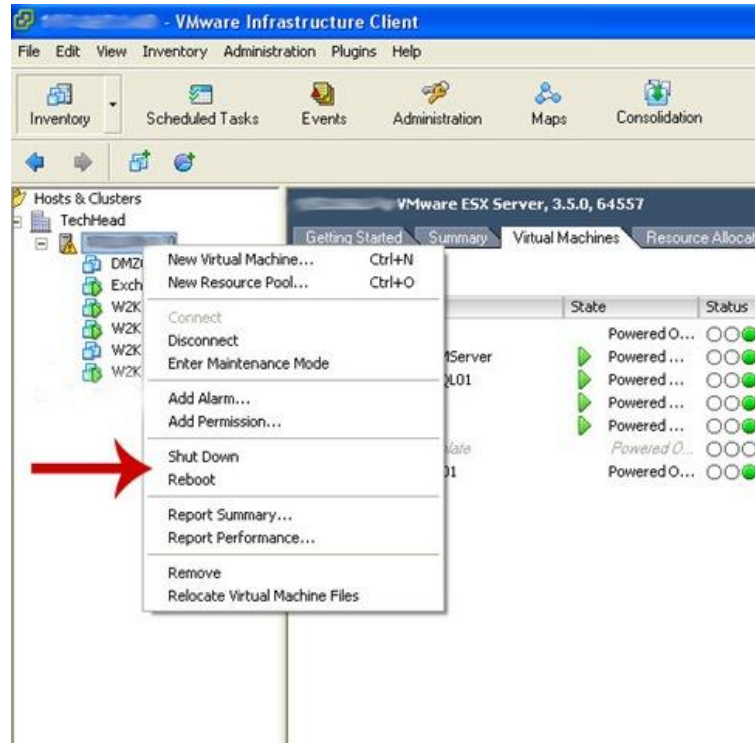- Virtualização para baixa plataforma

    Nova visão para aplicações WEB

    IaaS / Lançamento AWS

    Dilema de Tostines

- ?aaS tudo vira "as a service"
- APIs
    - REST e JSON - padrão

IAC - Antes e depois

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```
{
    "AWSTemplateFormatVersion" : "2010-09-09",
    "Mappings" : {
        "RegionMap" : {
            "us-east-1" : {
                "AMI" : "ami-76f0061f"
            },
            "us-west-1" : {
                "AMI" : "ami-655a0a20"
            },
            "eu-west-1" : {
                "AMI" : "ami-7fd4e10b"
            },
            "ap-northeast-1" : {
                "AMI" : "ami-8e08a38f"
            },
            "ap-southeast-1" : {
                "AMI" : "ami-72621c20"
            }
        }
    },
    "Resources" : {
        "Ec2Instance" : {
            "Type" : "AWS::EC2::Instance",
            "Properties" : {
                "UserData" : { "Fn::Base64" : {"Ref" : "myWaitHandle"}},
                "ImageId" : { "Fn::FindInMap" : [ "RegionMap", { "Ref" : "AWS::Region" }, "AMI" ]}
            }
        },
        "myWaitHandle" : {
            "Type" : "AWS::CloudFormation::WaitConditionHandle",
            "Properties" : {
            }
        },
        "myWaitHandle" : {
            "Type" : "AWS::CloudFormation::WaitConditionHandle",
            "Properties" : {
            }
        },
        "myWaitCondition" : {
            "Type" : "AWS::CloudFormation::WaitCondition",
            "DependsOn" : "Ec2Instance",
            "Properties" : {
                "Handle" : { "Ref" : "myWaitHandle" },
                "Timeout" : "4500"
            }
        }
    },
    "Outputs" : {
        "ApplicationData" : {
            "Value" : { "Fn::GetAtt" : [ "myWaitCondition", "Data" ]},
            "Description" : "The data passed back as part of signalling the WaitCondition."
        }
    }
}
```

IAC - Antes e depois

root@debian-server:~# apt-get install apache2
root@debian-server:~# update-rc.d apache2 start defaults
root@debian-server:~# /etc/init.d/apache2 start

...

[root@centos-server ~]# yum install httpd
[root@centos-server ~]# systemctl enable httpd
[root@centos-server ~]# systemctl start httpd

IAC - Antes e depois

```
$apache_server = $::operatingsystem ? {
    CentOS  => 'httpd',
    default => 'apache2',
}

package { $apache_server:
    ensure => 'present',
    alias  => 'apache_server',
}
```

IAC e DevOPS

- IAC é a base para DevOPS

- Com a maneira de trabalhar CI/CD, OPS entrou no ciclo de desenvolvimento.

- Automação em todas as fases

- Testes incluem aspectos de infra (*)

* "Editing production server configuration by hand is like playing Russian Roulette with your business…running untested configuration scripts against a groups of servers is like playing Russian Roulette with a machine gun". Kief Morris

IAC - Ferramentas e processos

- BareMetal => PXE (*)

- Gerenciamento de Configuração => Puppet/Chef/Salt/Ansible... (*)

- Gerenciamento de virtualização => **AWS**/OpenStack/CloudStack/OpenNebula... (*)

- Gerenciamento de código => Git/Mercurial...

- **Execução contínua**

- **Iteração contínua**

- Processos => Kanban / ITIL

* Foreman

Referências

Infrastructure as Code, Kief Morris - O'Reilly

http://shop.oreilly.com/product/0636920039297.do

How Does AWS CloudFormation Work?

http://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/cfn-whatis-howdoesitwork.html

Puppet CookBook

http://www.puppetcookbook.com/

The Power of Abstraction - Barbara Liskov

https://www.youtube.com/watch?v=GDVAHA0oyJU&nohtml5=False / https://www.youtube.com/watch?v=qAKrMdUycb8&nohtml5=False

DevOPS

https://sdarchitect.wordpress.com/understanding-devops/

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