



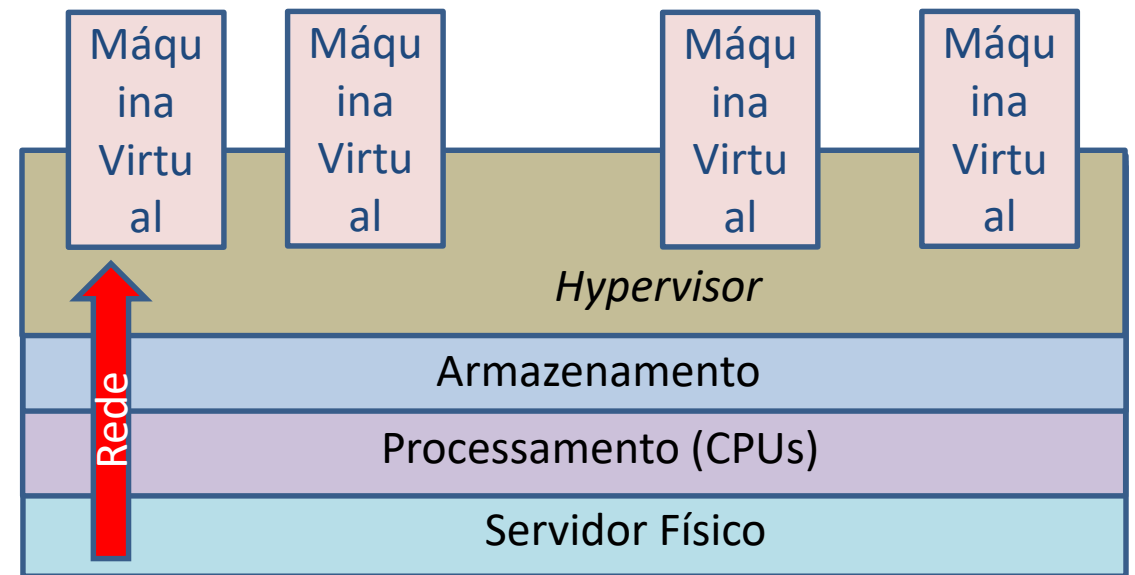
UNIVERSIDADE FEDERAL DO CEARÁ
Campus Quixadá
Curso: Redes de Computadores
Disciplina: Administração de SO Windows

Aula extra – Introdução à Amazon AWS e ao Programa AWS Educate

Prof. Rafael Braga

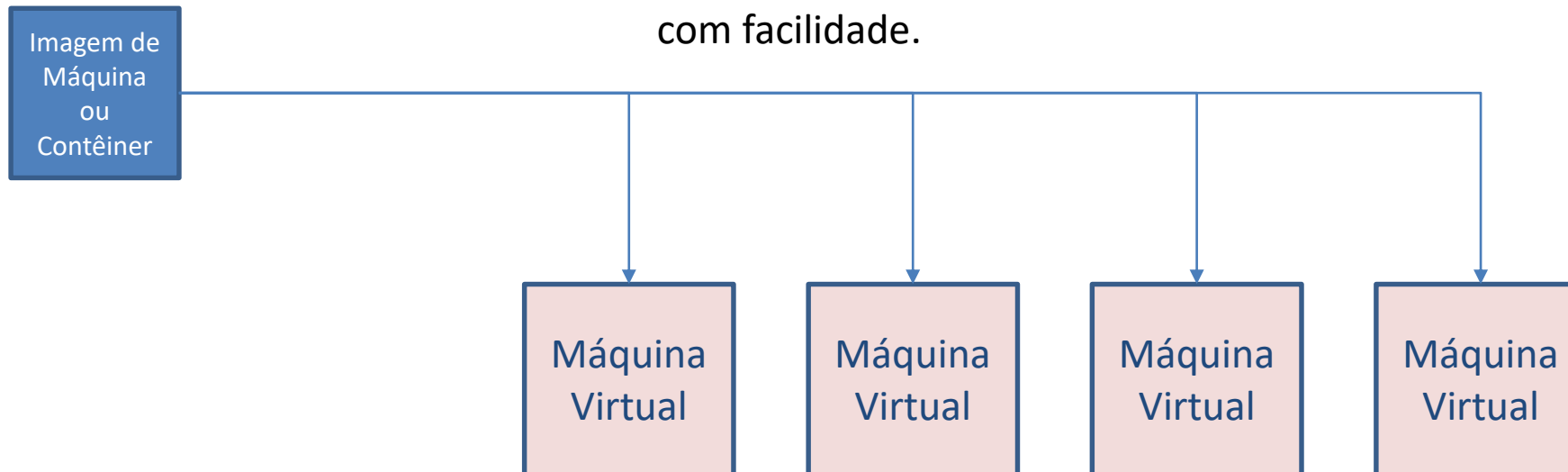
Introdução - O que é a nuvem?

- Agora que temos o acesso configurado, vamos retornar à nuvem...
 - A nuvem é um grande sistema de virtualização de recursos computacionais
 - Computação (Processamento)
 - Armazenamento
 - Rede
 - O usuário cria versões virtuais dos recursos para executar suas aplicações



Escalabilidade da Nuvem

O desenvolvedor pode configurar uma *imagem* do ambiente de execução da sua aplicação e criar várias instâncias com facilidade.



Regiões e Zonas de Disponibilidade

- AWS é uma Nuvem pública organizada em **Regiões**
- Cada região corresponde a uma localidade geográfica onde a Amazon mantém 1 ou mais *datacenters*

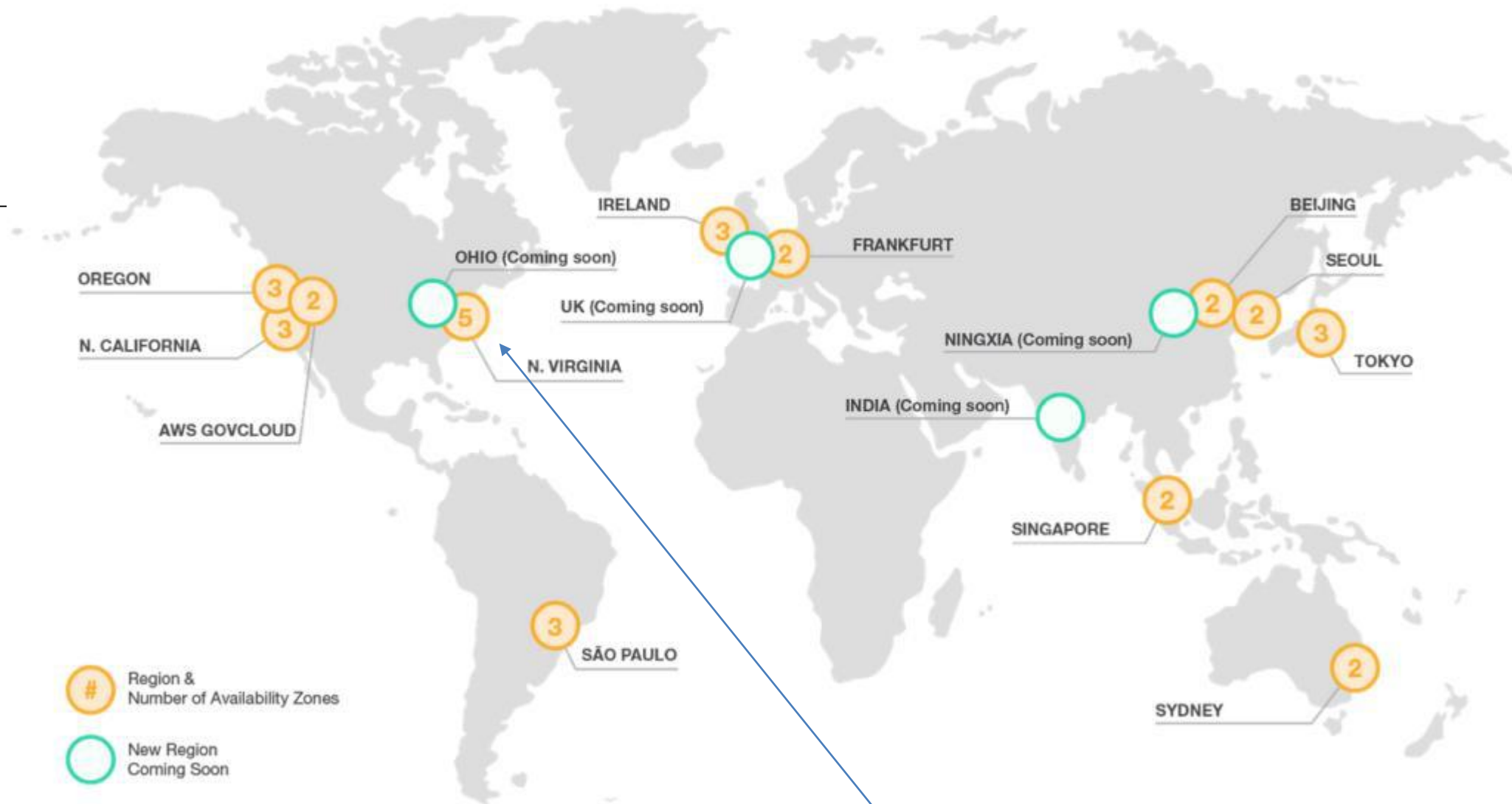
Nome da Região	Sigla
US East (Ohio)	<i>us-east-2</i>
US East (N. Virginia)	<i>us-east-1</i>
EU (Frankfurt)	<i>eu-central-1</i>
Asia Pacific (Singapore)	<i>ap-southeast-1</i>
China (Beijing)	<i>cn-north-1</i>
South America (São Paulo)	<i>sa-east-1</i>

Só alguns
exemplos,
são várias
regiões

Usuários têm acesso a todas regiões, mas cada uma tem sua tabela de preços independente.

Regiões e Zonas de Disponibilidade

- Dentro de uma mesma **Região**, a Amazon mantém vários *datacenters*
- Cada *datacenter* é chamado de **Zona de Disponibilidade**
- Recursos virtuais criados na nuvem
 - Estão atrelados a uma zona de disponibilidade
 - Na maioria dos casos, podem ser conectados entre si se estiverem na mesma região
- Configurar sua aplicação para executar em várias regiões ao mesmo tempo precisam ser integrados em serviços de mais alto nível
 - Balanceadores de carga
 - Redes de distribuição de conteúdo



Para efeitos de aprendizado, é melhor fazer tudo na região **us-east-1**, pois costuma ser a mais barata

Como acessar a AWS?

- No seu núcleo, a AWS é um conjunto de serviços REST
 - Comunicação através do protocolo HTTPS
 - Troca de mensagens baseadas em JSON
- Porém, acessar de forma direta os serviços é complicado
- Outras camadas de acesso estão disponíveis
 - Interface *web*
 - Ferramentas de linha de comando
 - *Frameworks* para as mais diversas linguagens

Quais os serviços da AWS?

- Para cada estrela no céu, existe um serviço da AWS
 - Os estruturais são
 - EC2 (virtualização de servidores)
 - S3 (virtualização de armazenamento de objetos)
 - VPC (redes virtuais)
 - Em cima dos serviços básicos, novas camadas de abstrações são criadas
 - Mas por debaixo dos panos, há sempre uma instância no EC2, mesmo que você não saiba qual é
-



Computação

EC2

Lightsail [↗](#)

ECR

ECS

EKS

Lambda

Batch

Elastic Beanstalk

Serverless Application Repository



Robótica

AWS RoboMaker



Blockchain

Amazon Managed Blockchain



Satélite

Ground Station



Análise De Dados

Athena

EMR

CloudSearch

Elasticsearch Service

Kinesis

QuickSight [↗](#)

Data Pipeline

AWS Glue

AWS Lake Formation

MSK



Aplicativos Empresariais

Alexa for Business

Amazon Chime [↗](#)

WorkMail



Computação De Usuário Final

WorkSpaces

AppStream 2.0

WorkDocs

WorkLink



Armazenamento

S3

EFS

FSx

S3 Glacier

Storage Gateway

AWS Backup



Gerenciamento E Governança

AWS Organizations

CloudWatch

AWS Auto Scaling

CloudFormation

CloudTrail

Config

OpsWorks

Service Catalog

Systems Manager

Trusted Advisor

Managed Services

Control Tower

AWS License Manager

AWS Well-Architected Tool

Personal Health Dashboard [↗](#)

AWS Chatbot



Segurança, Identidade E Conformidade

IAM

Resource Access Manager

Cognito

Secrets Manager

GuardDuty

Inspector

Amazon Macie [↗](#)

AWS Single Sign-On

Certificate Manager

Key Management Service

CloudHSM

Directory Service

WAF & Shield

Artifact

Security Hub



Internet Das Coisas

IoT Core

Amazon FreeRTOS

IoT 1-Click

IoT Analytics

IoT Device Defender

IoT Device Management

IoT Events

IoT Greengrass

IoT SiteWise

IoT Things Graph



Banco De Dados

RDS

DynamoDB

ElastiCache

Neptune

Amazon Redshift

Amazon QLDB

Amazon DocumentDB



Desenvolvimento De Jogos

Amazon GameLift



Migração E Transferência

AWS Migration Hub
Application Discovery Service
Database Migration Service
Server Migration Service
AWS Transfer for SFTP
Snowball
DataSync



Serviços De Mídia

Elastic Transcoder
Kinesis Video Streams
MediaConnect
MediaConvert
MediaLive
MediaPackage
MediaStore
MediaTailor
Elemental Appliances & Software



Dispositivos Móveis

AWS Amplify
Mobile Hub
AWS AppSync
Device Farm



Redes E Entrega De Conteúdo

VPC
CloudFront
Route 53
API Gateway
Direct Connect
AWS App Mesh
AWS Cloud Map
Global Accelerator ↗



Machine Learning

Amazon SageMaker
Amazon Comprehend
AWS DeepLens
Amazon Lex
Machine Learning
Amazon Polly
Rekognition
Amazon Transcribe
Amazon Translate
Amazon Personalize
Amazon Forecast
Amazon Textract
AWS DeepRacer



AR E VR

Amazon Sumerian



Integração De Aplicativos

Step Functions
Amazon EventBridge
Amazon MQ
Simple Notification Service
Simple Queue Service
SWF



Ferramentas Do Desenvolvedor

CodeStar
CodeCommit
CodeBuild
CodeDeploy
CodePipeline
Cloud9
X-Ray



Gerenciamento De Custos Da AWS

AWS Cost Explorer
AWS Budgets
AWS Marketplace Subscriptions



Envolvimento De Clientes

Amazon Connect
Pinpoint
Simple Email Service

Só os serviços de *Machine Learning* já são um universo por conta própria

Amazon EC2

- Vamos começar usando a interface *web* para criar uma máquina virtual (chamada de instância na nuvem)
- Etapas
 1. Escolher a **imagem** de origem (sistema operacional)
 2. Definir a configuração do **hardware** virtual (tipo de instância)
 3. Configuração de **rede**
 4. **Armazenamento**
 5. *Tags*
 6. **Grupo de Segurança**
 7. Lançar (escolher **chave**)
- Comecem indo para Serviços/Computação/EC2 e em seguida,



Amazon EC2 – Escolher a Imagem

Step 1: Choose an Amazon Machine Image (AMI)

[Cancel and Exit](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.


Quick Start

My AMIs

AWS Marketplace


Community AMIs

☐ Free tier only ⓘ

**Amazon Linux**
Free tier eligible


Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0b69ea66ff7391e80 (64-bit x86) / ami-09c61c4850b7465cb (64-bit Arm)
Amazon Linux 2 comes with five years support. It provides Linux kernel 4.14 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras.
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Select
☒ 64-bit (x86)
☐ 64-bit (Arm)

**Amazon Linux**
Free tier eligible


Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type - ami-00eb20669e0990cb4
The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Select
64-bit (x86)

**Red Hat**
Free tier eligible


Red Hat Enterprise Linux 8 (HVM), SSD Volume Type - ami-0c322300a1dd5dc79 (64-bit x86) / ami-03587fa4048e9eb92 (64-bit Arm)
Red Hat Enterprise Linux version 8 (HVM), EBS General Purpose (SSD) Volume Type
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Select
☒ 64-bit (x86)
☐ 64-bit (Arm)

**SUSE Linux**
Free tier eligible


SUSE Linux Enterprise Server 15 SP1 (HVM), SSD Volume Type - ami-0b5372ab3202bd20b (64-bit x86) / ami-0072af0151fbe67b9 (64-bit Arm)
SUSE Linux Enterprise Server 15 Service Pack 1 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled.

Select
☒ 64-bit (x86)
☐ 64-bit (Arm)

**Ubuntu**
Free tier eligible


Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-07d0cf3af28718ef8 (64-bit x86) / ami-0c46f9f09e3a8c2b5 (64-bit Arm)
Ubuntu Server 18.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Select
☒ 64-bit (x86)
☐ 64-bit (Arm)

**Amazon RDS**

Are you launching a database instance? Try Amazon RDS.
Amazon Relational Database Service (RDS) makes it easy to set up, operate, and scale your database on AWS by automating time-consuming database management tasks. With RDS, you can easily deploy **Amazon Aurora, MariaDB, MySQL, Oracle, PostgreSQL, and SQL Server** databases on AWS. [Aurora](#) is a MySQL- and PostgreSQL-compatible, enterprise-class database at 1/10th the cost of commercial databases. [Learn more about RDS](#)
Launch a database using RDS

Hide

**Ubuntu**
Free tier eligible

Ubuntu Server 16.04 LTS (HVM), SSD Volume Type - ami-0cfee17793b08a293 (64-bit x86) / ami-0f01fcbe971af8f5a (64-bit Arm)
Ubuntu Server 16.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Select
☒ 64-bit (x86)
☐ 64-bit (Arm)

Vamos de Ubuntu 18.04 64 bits

Amazon EC2 – Escolher o Tipo da Instância

Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: All instance types Current generation [Show/Hide Columns](#)

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs ⓘ	Memory (GiB)	Instance Storage (GB) ⓘ	EBS-Optimized Available ⓘ	Network Performance ⓘ	IPv6 Support ⓘ
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes

Cancel

Previous

Review and Launch

Next: Configure Instance Details

Amazon EC2 – Configuração de Rede

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances	<input type="text" value="1"/>	Launch into Auto Scaling Group
Purchasing option	<input type="checkbox"/> Request Spot instances	
Network	<input type="text" value="vpc-7ccda306 (default)"/>	Create new VPC
Subnet	<input type="text" value="No preference (default subnet in any Availability Zone)"/>	Create new subnet
Auto-assign Public IP	<input type="text" value="Use subnet setting (Enable)"/>	
Placement group	<input type="checkbox"/> Add instance to placement group	
Capacity Reservation	<input type="text" value="Open"/>	Create new Capacity Reservation
IAM role	<input type="text" value="None"/>	Create new IAM role
Shutdown behavior	<input type="text" value="Stop"/>	
Enable termination protection	<input type="checkbox"/> Protect against accidental termination	
Monitoring	<input type="checkbox"/> Enable CloudWatch detailed monitoring Additional charges apply.	
Tenancy	<input type="text" value="Shared - Run a shared hardware instance"/> Additional charges will apply for dedicated tenancy.	
Elastic Inference	<input type="checkbox"/> Add an Elastic Inference accelerator Additional charges apply.	
T2/T3 Unlimited	<input type="checkbox"/> Enable Additional charges may apply	

Vários detalhes que não precisamos nos preocupar por enquanto

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Storage](#)

Amazon EC2 – Armazenamento

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type ⓘ	Device ⓘ	Snapshot ⓘ	Size (GiB) ⓘ	Volume Type ⓘ	IOPS ⓘ	Throughput (MB/s) ⓘ	Delete on Termination ⓘ	Encryption ⓘ
Root	/dev/sda1	snap-05c47a3b3d7bca907	<input type="text" value="8"/>	General Purpose SSD (gp2) ▾	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted ▾

Add New Volume

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.



Amazon EC2 - *Tags*

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.

A copy of a tag can be applied to volumes, instances or both.

Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key (128 characters maximum)	Value (256 characters maximum)	Instances ⓘ	Volumes ⓘ
This resource currently has no tags			
Choose the Add tag button or click to add a Name tag . Make sure your IAM policy includes permissions to create tags.			
<div>Add Tag (Up to 50 tags maximum)</div>			

Tags servem para organizar os recursos.

Cancel

Previous

Review and Launch

Next: Configure Security Group



Amazon EC2 – Grupo de Segurança

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☒ Create a new security group

☐ Select an existing security group

Security group name:

Description:

Type <small>i</small>	Protocol <small>i</small>	Port Range <small>i</small>	Source <small>i</small>	Description <small>i</small>	
SSH <small>v</small>	TCP	22	Custom <small>v</small> 0.0.0.0/0	Acesso via SSH Liberado	<small>x</small>
HTTP <small>v</small>	TCP	80	Custom <small>v</small> 0.0.0.0/0, ::/0	Servidor Web	<small>x</small>

Add Rule



Warning

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

O grupo de segurança é o *firewall* da sua instância



Cancel


Previous

Review and Launch

Amazon EC2 – Lançar (Configurar Chaves)


Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

 **Improve your instances' security. Your security group, alunoufc, is open to the world.**
Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.
You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

▼ AMI Details

Edit AMI

 **Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-07d0cf3af28718ef8**

Free tier eligible

Ubuntu Server 18.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).
Root Device Type: ebs Virtualization type: hvm

▼ Instance Type

Edit instance type

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

▼ Security Groups

Edit security groups

Security group name

alunoufc

Description

Grupo Alunoufc

Cancel

Previous

Launch



Amazon EC2 – Lançar (Configurar Chaves)

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Create a new key pair

Key pair name

alunoufc

Download Key Pair

You have to download the **private key file** (*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

Cancel

Launch Instances

Salve (e guarde!!!) o arquivo .pem

Dispare a instância

Amazon EC2 – Instância Lançada

Launch Instance ▾ Connect Actions ▾

Filter by tags and attributes or search by keyword

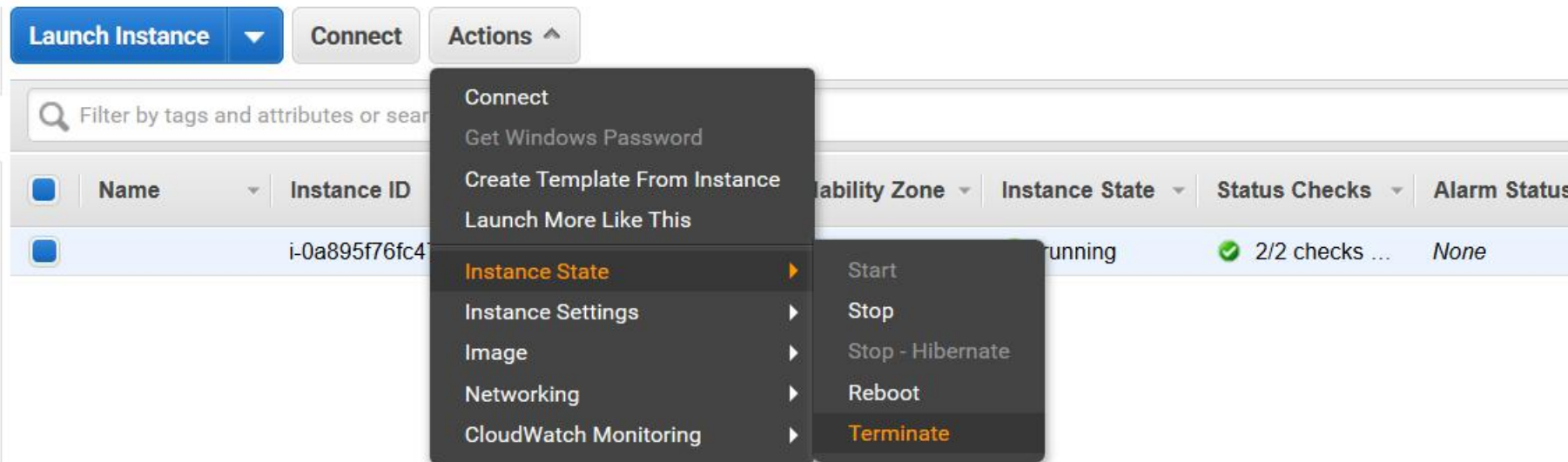
Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6 IPs	Key Name	Monitoring	Launch Time
	i-0a895f76fc471e816	t2.micro	us-east-1a	running	2/2 checks ...	None	ec2-54-235-5-182.com...	54.235.5.182	-	alunoufc	disabled	September 11, 2019 at 3:23:...

E agora, o que faço com isso?!?!?

Vamos usar a chave para acessar o servidor via SSH

Amazon EC2 – Finalizando a Instância

- Após qualquer teste ou treinamento, termine as instâncias!!!
- Não deixe em execução, pois os créditos serão consumidos



Conclusão

- Agradeço ao Prof. João Marcelo por disponibilizar os slides.