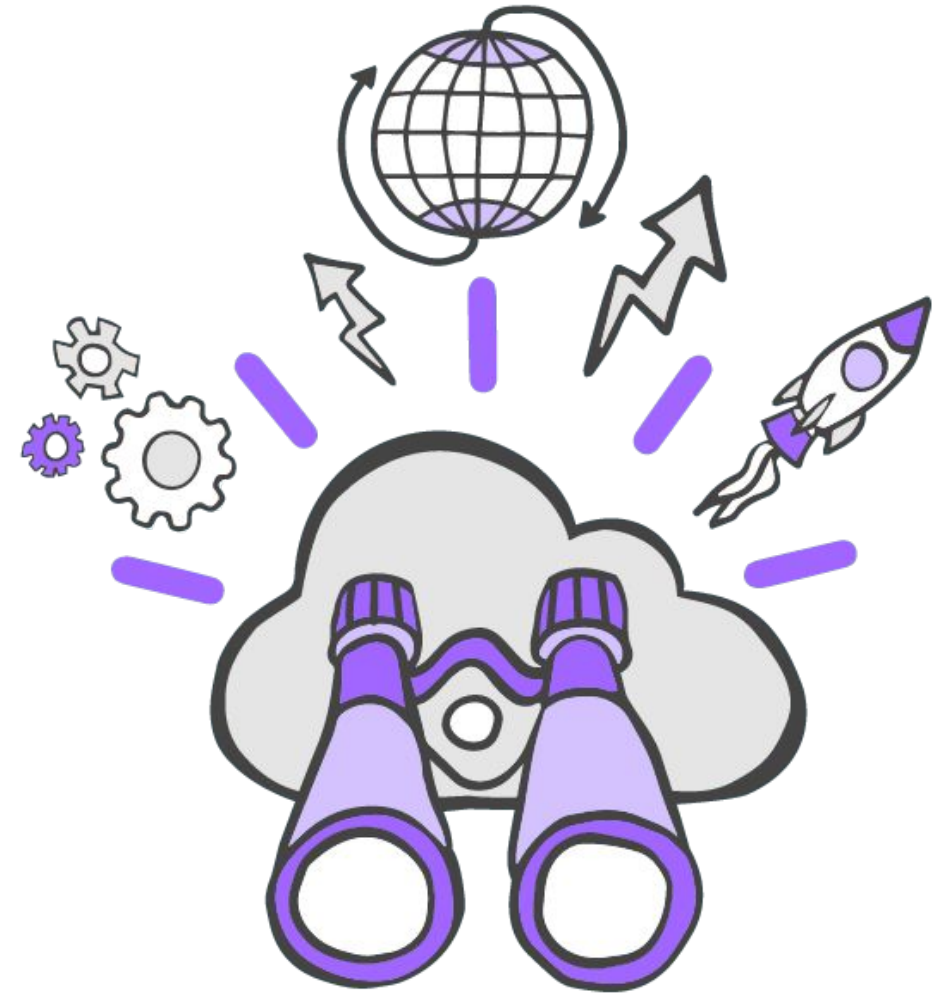


Introduction to the cloud

Daniel Díaz-López, PhD

danielo.diaz@urosario.edu.co



Agenda

- What is the cloud
- Security in the cloud
- Deploy an AWS instance
- Launch a vulnerability assessment



What Is the Cloud?

Cloud computing benefits many industries



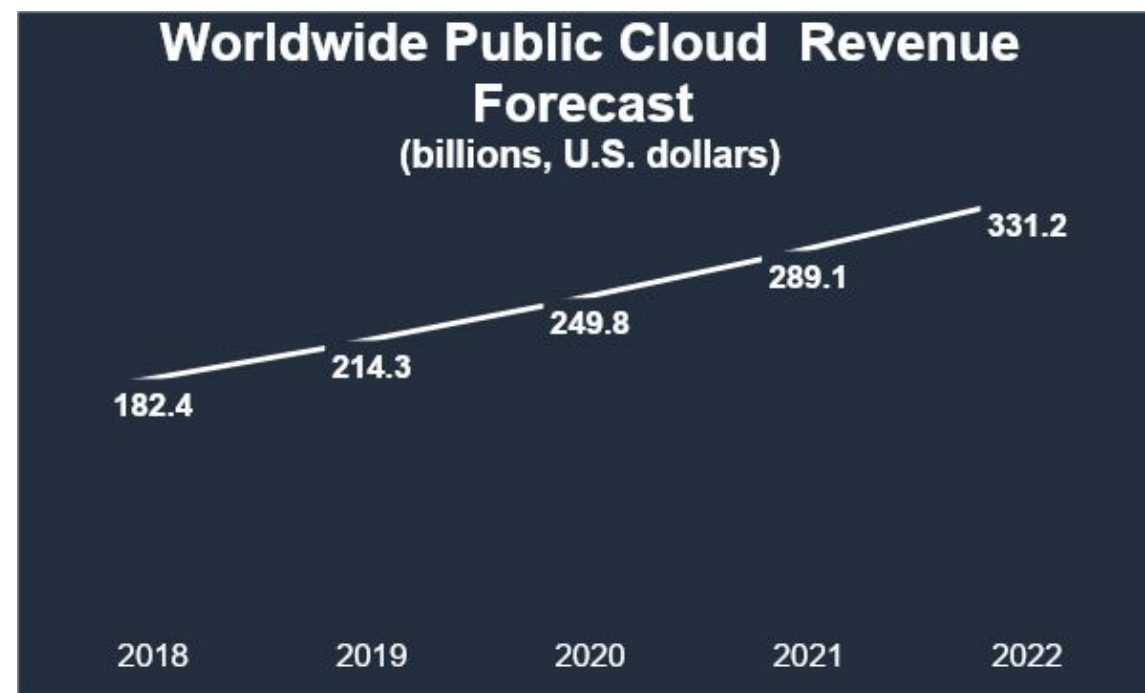
“The cloud” refers to the on-demand delivery of IT resources via the Internet with pay-as-you-go pricing

Cloud computing by the numbers

Cloud computing **ranked as top skill** since 2014¹

80% Of Enterprise IT will move to the cloud by 2025²

94% of workloads was processed in the cloud in 2021³



Source: Gartner

Global computing market **+15% YoY**

Why are organizations moving to the cloud?



Agility



Cost Savings



Elasticity



Innovation



Global

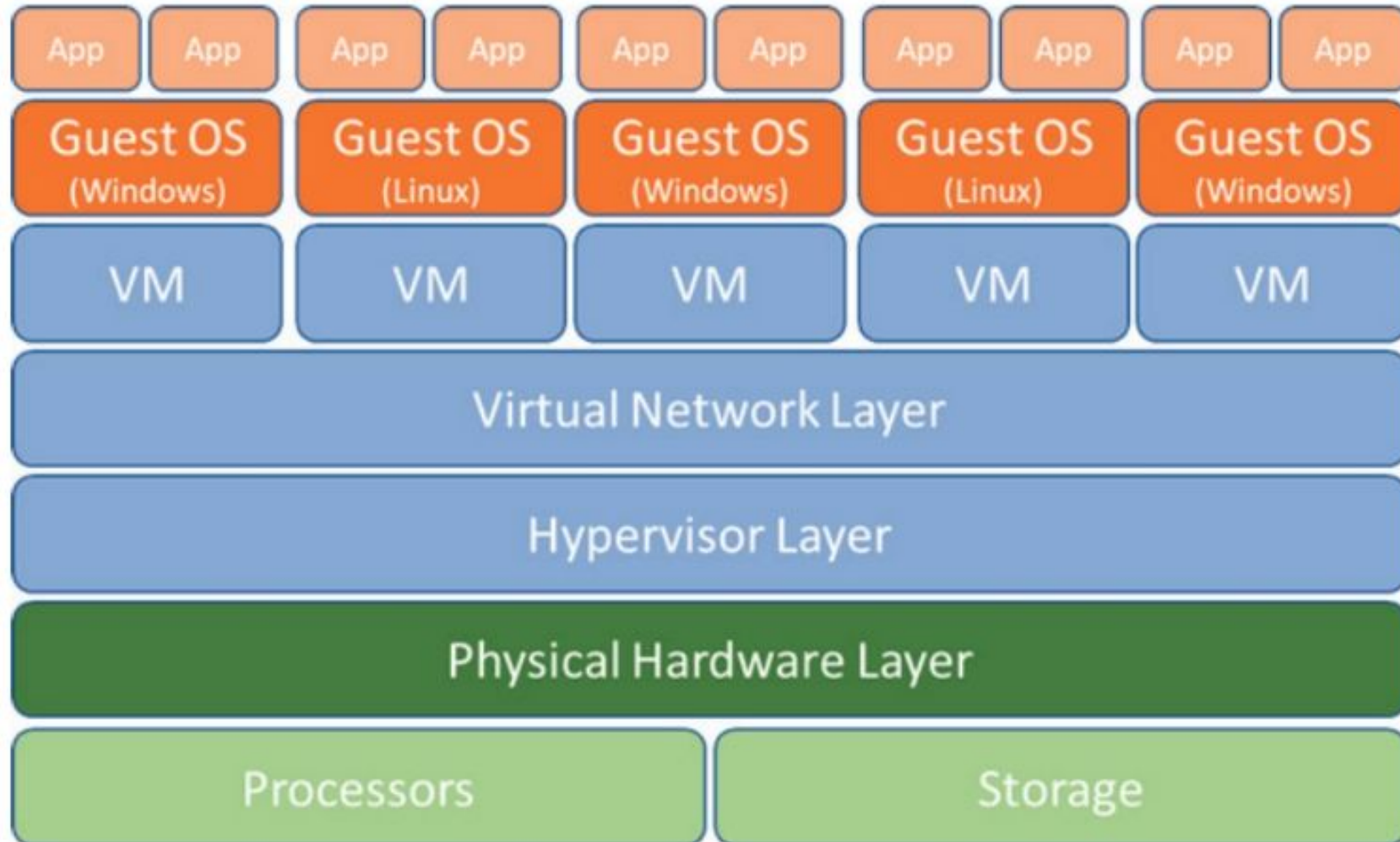
“We cut the IT expense of digitization by 60% with AWS.”

*Anjanesh Babu
Oxford University*

“The AWS cloud gives our researchers faster access to cleaner data so they can collaborate more effectively to address new research questions and arrive at more cohesive interpretations of data.”

*Lindsay Der, PhD
Stanford University*

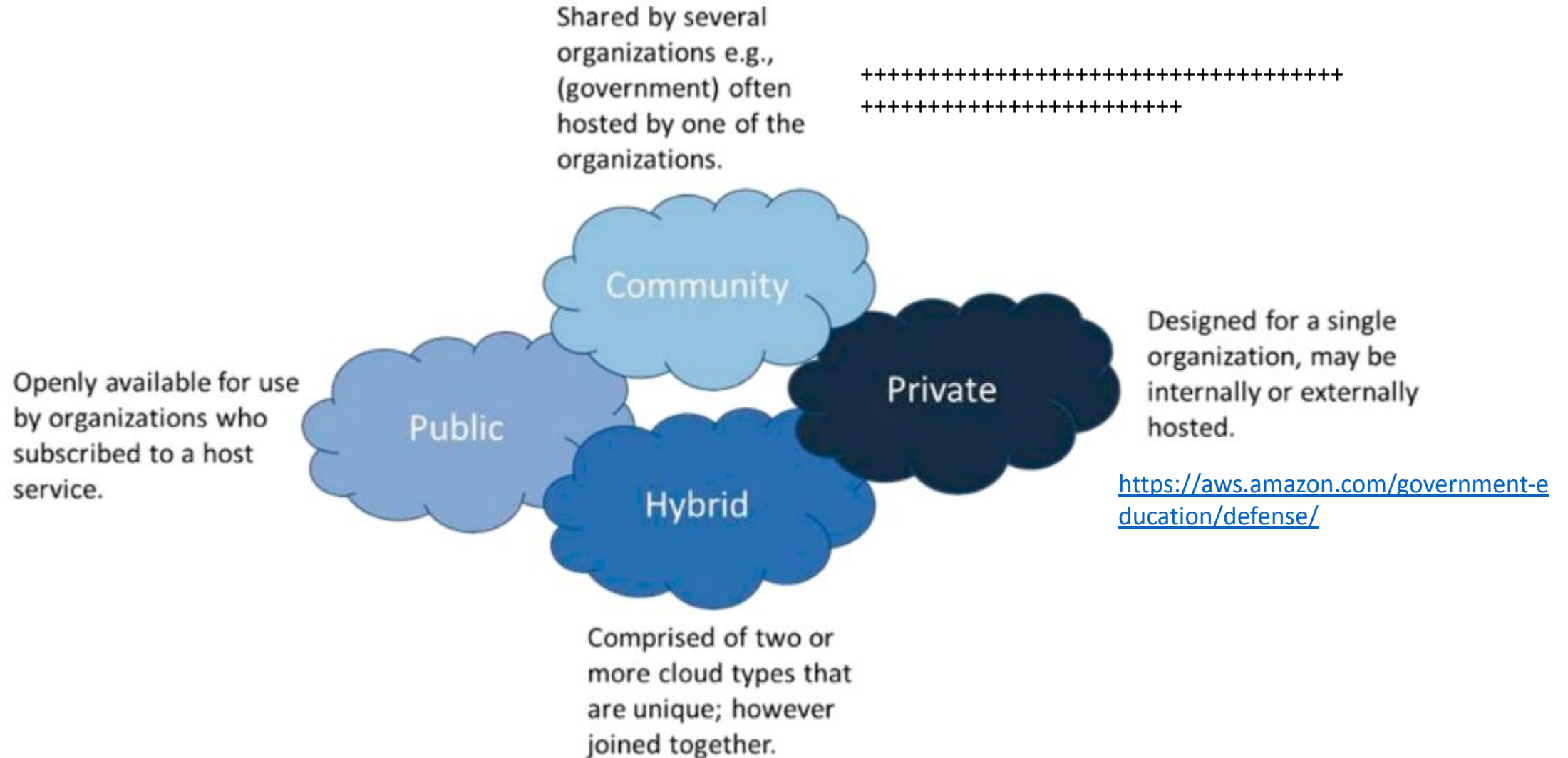
Composition of a Virtualized Environment



Please access to the following URL

- <https://forms.office.com/r/JapkD2qVaL>

Cloud Computing Types (According to type of users)



Cloud Computing Types (According to the responsibility of management)

- With IaaS, you **rent IT infrastructure** such as servers and VMs, storage, networks, operating systems and pay for time of usage.
- Platform as a Service (PaaS) refers to cloud computing services that supply an **on-demand environment** for developing, testing, delivering, and managing software applications.
- Software as a Service (SaaS) is a method for **delivering software applications on demand** with a subscription payment model.

On-site	IaaS	PaaS	SaaS
Applications	Applications	Applications	Applications
Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware
O/S	O/S	O/S	O/S
Virtualization	Virtualization	Virtualization	Virtualization
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

-  You manage
-  Service provider manages

Please access to the following URL

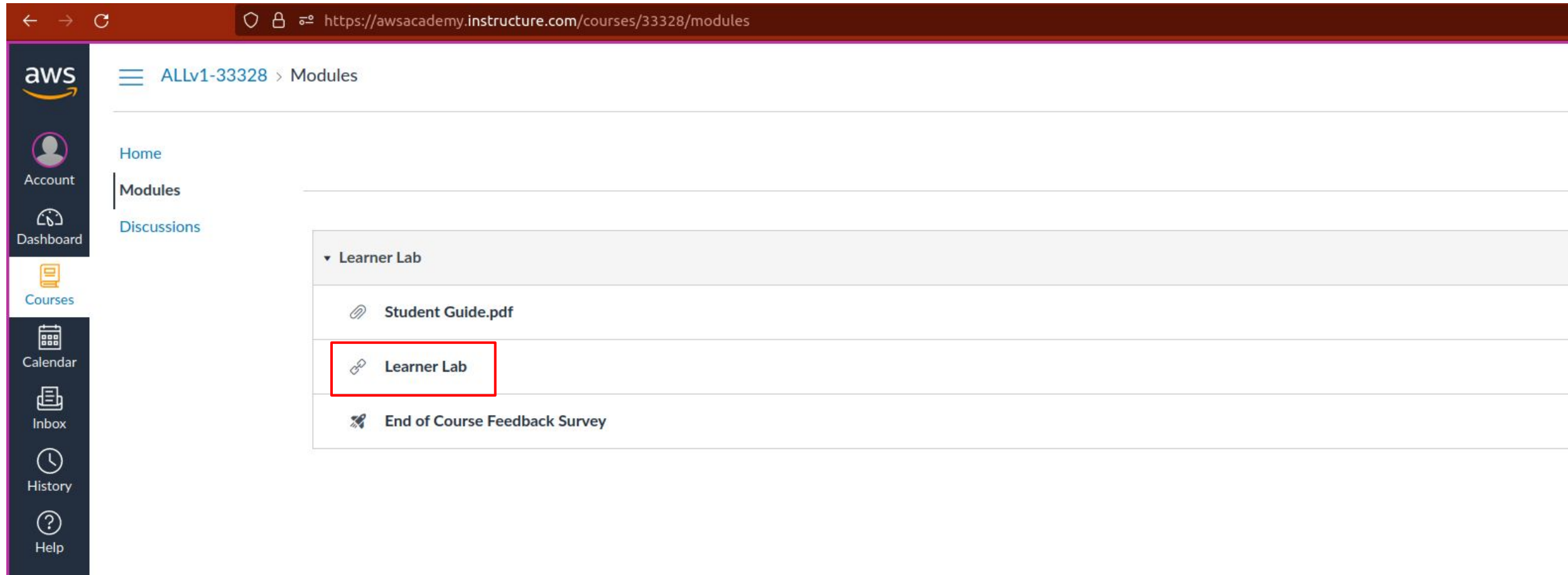
- <https://forms.office.com/r/9TAahaRhPu>

What we have learnt until now?

- What is the cloud?
- How is the layer composition of the cloud?
- Types of cloud computing
- Cloud Computing Types (According to the responsibility of management)

Deploying a virtual machine in *AWS*

After you log in AWS Academy, and select “AWS Academy Learner Lab”, you may go to “modules” and then click “Learner lab” to start the laboratory



The screenshot shows the AWS Academy Learner Lab interface. The browser address bar displays the URL `https://awsacademy.instructure.com/courses/33328/modules`. The left sidebar contains navigation links: Home, Modules (selected), and Discussions. The main content area shows a list of items under the 'Learner Lab' section, including 'Student Guide.pdf', 'Learner Lab' (highlighted with a red box), and 'End of Course Feedback Survey'.

aws

ALLv1-33328 > Modules

Home

Modules

Discussions

▼ Learner Lab

Student Guide.pdf

Learner Lab

End of Course Feedback Survey

First you have to accept the terms of the service

 ALLv1-38836 > Modules > Learner Lab > Learner Lab

[Home](#)
Modules
[Discussions](#)

Federal Rule of Civil Procedure 11(b)).

Changes

Notwithstanding the provisions of the “Changes to Terms or Services” section above, if Vocareum changes this “Dispute Resolution” section after the date you first accepted these Terms (or accepted any subsequent changes to these Terms), you may reject any such change by sending us written notice (including by email to www.Vocareum.com) within 30 days of the date such change became effective, as indicated in the “Last Updated” date above or in the date of Vocareum’s email to you notifying you of such change. By rejecting any change, you are agreeing that you will arbitrate any Dispute between you and Vocareum in accordance with the provisions of this “Dispute Resolution” section as of the date you first accepted these Terms (or accepted any subsequent changes to these Terms).

16. General Terms

These Terms constitute the entire and exclusive understanding and agreement between Vocareum and you regarding the Services and Content, and these Terms supersede and replace any and all prior oral or written understandings or agreements between Vocareum and you regarding the Services and Content. If any provision of these Terms is held invalid or unenforceable (either by an arbitrator appointed pursuant to the terms of the “Arbitration” section above or by court of competent jurisdiction, if you opt out of arbitration by sending us an Arbitration Opt-out Notice in accordance with the terms set forth above), that provision will be enforced to the maximum extent permissible and the other provisions of these Terms will remain in full force and effect.

You may not assign or transfer these Terms, by operation of law or otherwise, without Vocareum’s prior written consent. Any attempt by you to assign or transfer these Terms, without such consent, will be null. Vocareum may freely assign or transfer these Terms without restriction. Subject to the foregoing, these Terms will bind and inure to the benefit of the parties, their successors and permitted assigns.

Any notices or other communications provided by Vocareum under these Terms, including those regarding modifications to these Terms, will be given: (i) via email; or (ii) by posting to the Services. For notices made by e-mail, the date of receipt will be deemed the date on which such notice is transmitted.

Vocareum’s failure to enforce any right or provision of these Terms will not be considered a waiver of such right or provision. The waiver of any such right or provision will be effective only if in writing and signed by a duly authorized representative of Vocareum. Except as expressly set forth in these Terms, the exercise by either party of any of its remedies under these Terms will be without prejudice to its other remedies under these Terms or otherwise.

Contact Information

If you have any questions about these Terms or the Services, please contact Vocareum at info@vocareum.com

I Agree

Then click on “Start Lab”, and wait until the red circle turns out green

The screenshot shows the AWS Learner Lab interface. At the top, there is a navigation bar with a red box around the 'AWS' label and a red circle. To the right of this bar is a 'Start Lab' button, also highlighted with a red box. Below the navigation bar is a terminal window showing the prompt 'ccc_v1_w_e43b6_35064@runweb72150:~\$'. A red box is drawn around the terminal area, and a green circle is shown next to the 'AWS' label. A dotted arrow points from the text 'red circle turns out green' to the green circle. Another dotted arrow points from the text 'Finally, click on the green circle to open the AWS Console' to the green circle. On the right side of the interface, there is a sidebar with the title 'Learner Lab' and a list of links: 'Environment Overview', 'Environment Navigation', 'Access the AWS Management Console', 'Region restriction', 'Service usage and other restrictions', 'Using the terminal in the browser', 'Running AWS CLI commands', 'Using the AWS SDK for Python', 'Preserving your budget', 'Accessing EC2 Instances', 'SSH Access to EC2 Instances', 'SSH Access from Windows', and 'SSH Access from a Mac'. Below this list is a section titled 'Environment Overview' with a description: 'This Learner Lab provides a sandbox environment for ad-hoc exploration of AWS services.' and a note: 'This environment is long-lived. When the session timer runs to 0:00, the session will end, but any data and resources that you created in the AWS account'.

Finally, click on the green circle to open the AWS Console

This is the AWS Console, where we may see all available amazon services:

We are connected to a
North Virginia datacenter

The screenshot shows the AWS Console Home page. The browser address bar displays the URL `https://us-east-1.console.aws.amazon.com/console/home?region=us-east-1#`. The AWS logo and 'Services' menu are on the left. A search bar is in the center. On the right, the region is set to 'N. Virginia' and the user is 'voclabs/user568142=Daniel_Diaz'. The main content area is titled 'Console Home' and includes a 'Reset to default layout' button and an 'Add widgets' button. The 'Recently visited' section lists services: EC2, CloudWatch, Amazon Inspector, Elastic Beanstalk, AWS App Runner, AWS Amplify, and AWS Health Dashboard. The 'Welcome to AWS' sidebar contains links for 'Getting started with AWS', 'Training and certification', and 'What's new with AWS?'. A red arrow points to the 'N. Virginia' region dropdown in the top right corner.

← → ↻ `https://us-east-1.console.aws.amazon.com/console/home?region=us-east-1#` 130% ☆

aws Services [Alt+S] N. Virginia ▼ voclabs/user568142=Daniel_Diaz

Console Home [Info](#)

[Reset to default layout](#) [+ Add widgets](#)

Recently visited [Info](#)

- EC2
- CloudWatch
- Amazon Inspector
- Elastic Beanstalk
- AWS App Runner
- AWS Amplify
- AWS Health Dashboard [↗](#)

[View all services](#)

Welcome to AWS

- [Getting started with AWS](#) [↗](#)
Learn the fundamentals and find valuable information to get the most out of AWS.
- [Training and certification](#) [↗](#)
Learn from AWS experts and advance your skills and knowledge.
- [What's new with AWS?](#) [↗](#)
Discover new AWS services, features, and Regions.

Let's write the name of one of the most popular services EC2 which allows us to create virtual instances in the cloud:

The screenshot shows the AWS Management Console interface with a search bar at the top containing the text 'ec2'. The search results are displayed in a dark-themed overlay. On the left side of the overlay, there is a sidebar with various categories: Services (11), Features (51), Resources (with a 'New' badge), Blogs (1,853), Documentation (125,404), Knowledge Articles (30), Tutorials (19), Events (8), and Marketplace (1,774). The main content area is titled 'Search results for 'ec2'' and is divided into two sections: 'Services' and 'Features'. The 'Services' section lists four items: EC2 (Virtual Servers in the Cloud), EC2 Image Builder (A managed service to automate build, customize and deploy OS images), AWS Firewall Manager (Central management of firewall rules), and GuardDuty (Intelligent Threat Detection to Protect Your AWS Accounts and Workloads). The 'Features' section is partially visible at the bottom, showing 'Dashboard' and 'EC2 feature'. The EC2 service entry is highlighted with a red rectangular box. The top of the console shows the URL 'https://us-east-1.console.aws.amazon.com/console/home?region=us-east-1#' and the user's profile 'voclabs/user568142=Daniel_Diaz'.

Services (11)

Features (51)

Resources **New**

Blogs (1,853)

Documentation (125,404)

Knowledge Articles (30)

Tutorials (19)

Events (8)

Marketplace (1,774)

Search results for 'ec2'

Services [See all 11 results](#)

- EC2** ☆
Virtual Servers in the Cloud
Top features
[Dashboard](#) [Launch templates](#) [Instances](#) [Spot Instance requests](#) [Savings plans](#)
- EC2 Image Builder** ☆
A managed service to automate build, customize and deploy OS images
- AWS Firewall Manager** ☆
Central management of firewall rules
- GuardDuty** ☆
Intelligent Threat Detection to Protect Your AWS Accounts and Workloads

Features [See all 51 results](#)

- Dashboard**
EC2 feature

This is the interface of the EC2, here we can click in “Launch instance” to create a new born machine

The screenshot displays the AWS Management Console for the EC2 service in the US East (N. Virginia) region. The interface includes a top navigation bar with the AWS logo, a search bar, and a sidebar on the left with navigation links. The main content area is divided into several sections: a 'Resources' section showing usage of various EC2 resources, a 'Launch instance' section with a highlighted 'Launch instance' button, a 'Service health' section showing the status of the EC2 service, and a right-hand sidebar with account attributes and explore AWS options.

Navigation Bar: AWS logo, Services, Search bar, [Alt+S], Region: N. Virginia, User: voclabs/user568142=Daniel_Diaz @ 5030-1605-335

Left Sidebar:

- New EC2 Experience (Tell us what you think)
- EC2 Dashboard
- EC2 Global View
- Events
- Tags
- Limits
- Instances
 - Instances **New**
 - Instance Types
 - Launch Templates
 - Spot Requests
 - Savings Plans
 - Reserved Instances **New**
 - Dedicated Hosts
 - Scheduled Instances
 - Capacity Reservations
- Images
 - AMIs
 - AMI Catalog

Main Content Area:

Resources (EC2 Global view, Refresh, Settings)

You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:

Instances (running)	0	Dedicated Hosts	0	Elastic IPs	0
Instances	1	Key pairs	2	Load balancers	0
Placement groups	0	Security groups	2	Snapshots	0
Volumes	1				

Launch instance (To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.)

Launch instance (highlighted button) | Migrate a server

Note: Your instances will launch in the US East (N. Virginia) Region

Service health (Refresh, AWS Health Dashboard)

Region: US East (N. Virginia)

Status: **✔ This service is operating normally**

Right Sidebar:

- Account attributes** (Refresh)
 - Supported platforms
 - VPC
 - Default VPC
 - vpc-057be5b6d8b7bee6e
 - Settings
 - EBS encryption
 - Zones
 - EC2 Serial Console
 - Default credit specification
 - Console experiments
- Explore AWS** (Close)
 - Enable Best Price-Performance with AWS Graviton2**
 - AWS Graviton2 powered EC2 instances enable up to 40% better price performance for a broad spectrum of cloud workloads. [Learn more](#)

Launch an instance [Info](#)

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags [Info](#)

Name

Boost_server

[Add additional tags](#)

Let's choose a good name for our server

▼ Application and OS Images (Amazon Machine Image) [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Quick Start



Let's select an operative system

Amazon Machine Image (AMI)

Ubuntu Server 18.04 LTS (HVM), SSD Volume Type
ami-0ee23bfc74a881de5 (64-bit (x86)) / ami-0351643488963af72 (64-bit (Arm))
Virtualization: hvm ENA enabled: true Root device type: ebs

Free tier eligible ▼

Description

Canonical, Ubuntu, 18.04 LTS, amd64 bionic image build on 2022-09-01

Architecture

64-bit (x86) ▼

AMI ID

ami-0ee23bfc74a881de5

Verified provider

I have selected an Ubuntu 18.04 LTS with 64-bit

We need an authenticator to connect to our server, but maybe a password is not the best idea...

Instead, we can use asymmetric crypto to generate a public/private key that allow us to authenticate remotely with our machine and also encrypt communications!

▼ **Key pair (login)** [Info](#)

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

 [Create new key pair](#)

RSA will be the base algorithm that will support our key pair



A .pem will be generated with the data of the key pair. Please save your .pem file in a location that you remember



Create key pair ✕

Key pairs allow you to connect to your instance securely.

Enter the name of the key pair below. When prompted, store the private key in a secure and accessible location on your computer. **You will need it later to connect to your instance.** [Learn more](#) 

Key pair name

The name can include upto 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type

☒ **RSA**
RSA encrypted private and public key pair

☐ **ED25519**
ED25519 encrypted private and public key pair (Not supported for Windows instances)

Private key file format

☒ **.pem**
For use with OpenSSH

☐ **.ppk**
For use with PuTTY

[Cancel](#) [Create key pair](#)

We want that our machine can be reachable with SSH protocol, so we left this marked

We also want that our server can receive HTTPS requests because eventually it will be a web server attending many users

Even if not recommendable, we may also authorize the reception of HTTP requests

▼ Network settings [Info](#) Edit

Network [Info](#)
vpc-057be5b6d8b7bee6e

Subnet [Info](#)
No preference (Default subnet in any availability zone)

Auto-assign public IP [Info](#)
Enable

Firewall (security groups) [Info](#)
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☒ Create security group ☐ Select existing security group

We'll create a new security group called 'launch-wizard-2' with the following rules:

☒ **Allow SSH traffic from**
Helps you connect to your instance Anywhere
0.0.0.0/0 ▼

☒ **Allow HTTPS traffic from the internet**
To set up an endpoint, for example when creating a web server

☒ **Allow HTTP traffic from the internet**
To set up an endpoint, for example when creating a web server

 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. ×

Services

Search

[Alt+S]

Subnet

Info

No preference (Default subnet in any availability zone)

Auto-assign public IP

Info

Enable

Firewall (security groups)

Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

Create security group

Select existing security group

We'll create a new security group called 'launch-wizard-2' with the following rules:

☒ Allow SSH traffic from

Helps you connect to your instance

Anywhere

0.0.0.0/0

☒ Allow HTTPS traffic from the internet

To set up an endpoint, for example when creating a web server

☒ Allow HTTP traffic from the internet

To set up an endpoint, for example when creating a web server

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.

▼ Configure storage

Info

Advanced

1x 8 GiB gp2 Root volume (Not encrypted)

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage

Add new volume

The selected AMI contains more instance store volumes than the instance allows. Only the first 0 instance store volumes from the AMI will be accessible from the instance

0 x File systems

Edit

▼ Summary

Number of Instances

Info

1

Software Image (AMI)

Canonical, Ubuntu, 18.04 LTS, ...read more

ami-0ee23bfc74a881de5

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

Storage (volumes)

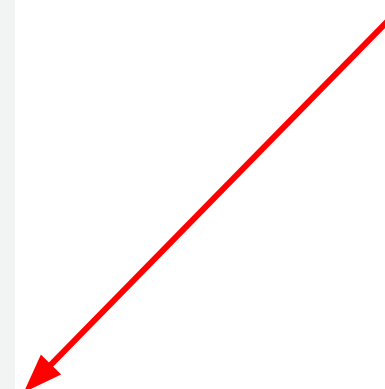
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel

Launch instance

Now we can create/launch our instance!



Our new instance is being launch!

→ ↺

🛡️ 🔒 🔍 https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:

Services 🔍 Search [Alt+S]

EC2 > Instances > Launch an instance

✓ Success

Successfully initiated launch of instance (i-0399855eaa1b33346)

▶ Launch log

Next Steps - preview

🔍 Search for next steps including taking action on the launched instances

The next steps search functionality only searches on a subset of possible steps. You can potentially find other matches for your search by using the search at the top of the page or by browsing the console

Create billing and free tier usage alerts

To manage costs and avoid surprise bills, set up email notifications for billing and free tier usage thresholds.

Create billing alerts ↗

Connect to your instance

Once your instance is running, log into it from your local computer.

Connect to instance ↗

Learn more ↗

Connect an RDS database New

Configure the connection between an EC2 instance and a database to allow traffic flow between them.

Connect an RDS database ↗

Create a new RDS database ↗ Learn more ↗

Here we can see the details of the instance (public IP, private IP, security rules, etc)

The screenshot displays the AWS Management Console interface for the EC2 service in the us-east-1 region. The left sidebar contains navigation links for various AWS services, including EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances, Images, Elastic Block Store, Network & Security, and Load Balancing. The main content area shows the 'Instances (1/2)' page with a table listing two instances: 'Mainpage_Mint' (Terminated) and 'Boost_server' (Running). The 'Boost_server' instance is selected, and its details are shown below the table. The details are organized into sections: Instance summary, Instance details, and Instance configuration. The 'Public IPv4 address' (3.91.222.149) and 'Private IPv4 addresses' (172.31.92.252) are highlighted with red boxes. The 'Instance state' is 'Running', and the 'Instance type' is 't2.micro'. The 'Platform' is 'Ubuntu (Inferred)', and the 'AMI ID' is 'ami-0ee23bfc74a881de5'. The 'Launch time' is 'Fri Dec 02 2022 10:49:57 GMT-0500 (Eastern Standard Time) (1 minute)'. The 'Lifecycle' is 'Standard'. The 'Instance auto-recovery' is 'Disabled'. The 'Stop protection' is 'Disabled'. The 'Platform details' are 'Linux/UNIX'. The 'VPC ID' is 'vpc-057be5b6d8b7bee6e'. The 'Subnet ID' is 'subnet-0d636e8beaaff3c4'. The 'Elastic IP addresses' are 'None'. The 'AWS Compute Optimizer finding' is 'Opt-in to AWS Compute Optimizer for recommendations. | Learn more'. The 'Auto Scaling Group name' is 'None'. The 'Monitoring' is 'disabled'. The 'Termination protection' is 'Disabled'. The 'AMI location' is 'amazon/ubuntu/images/hvm-ssd/ubuntu-bionic-18.04-amd64-server-20220901'. The 'Stop-hibernate behavior' is 'None'.

Instances (1/2) Info

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP	IPv6 IPs
Mainpage_Mint	i-027afc125962cfa81	Terminated	t2.micro	-	No alarms	us-east-1a	-	-	-	-
Boost_server	i-0399855eaa1b33346	Running	t2.micro	Initializing	No alarms	us-east-1a	ec2-3-91-222-149.com...	3.91.222.149	-	-

Instance: i-0399855eaa1b33346 (Boost_server)

Details | Security | Networking | Storage | Status checks | Monitoring | Tags

▼ Instance summary Info

Instance ID
i-0399855eaa1b33346 (Boost_server)

IPv6 address
-

Hostname type
IP name: ip-172-31-92-252.ec2.internal

Answer private resource DNS name
IPv4 (A)

Auto-assigned IP address
3.91.222.149 [Public IP]

IAM Role
-

▼ Instance details Info

Platform
Ubuntu (Inferred)

Platform details
Linux/UNIX

Stop protection
Disabled

Instance auto-recovery

Public IPv4 address
3.91.222.149 | [open address](#)

Private IPv4 addresses
172.31.92.252

Instance state
Running

Private IP DNS name (IPv4 only)
ip-172-31-92-252.ec2.internal

Instance type
t2.micro

VPC ID
vpc-057be5b6d8b7bee6e

Subnet ID
subnet-0d636e8beaaff3c4

Public IPv4 DNS
ec2-3-91-222-149.compute-1.amazonaws.com | [open address](#)

Elastic IP addresses
-

AWS Compute Optimizer finding
[Opt-in to AWS Compute Optimizer for recommendations. | Learn more](#)

Auto Scaling Group name
-

Monitoring
disabled

Termination protection
Disabled

AMI location
amazon/ubuntu/images/hvm-ssd/ubuntu-bionic-18.04-amd64-server-20220901

Stop-hibernate behavior
-

Next 4 slides include instructions for Windows users to connect to the virtual machine

Download and Install Putty and PuttyGen from the following link:
<https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>

Package files

You probably want one of these. They include versions of all the PuTTY utilities (except
(Not sure whether you want the 32-bit or the 64-bit version? Read the [FAQ entry](#).)

We also publish the latest PuTTY installers for all Windows architectures as a free-of-ch

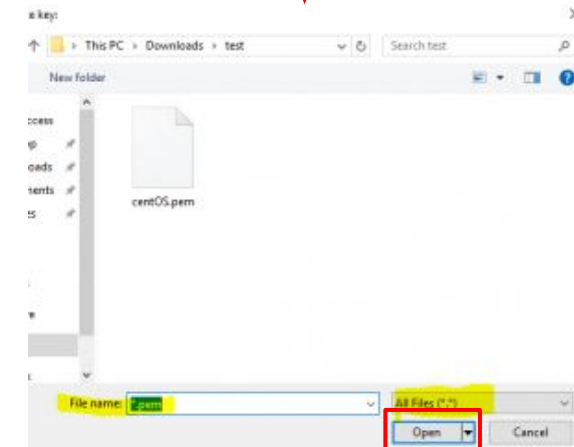
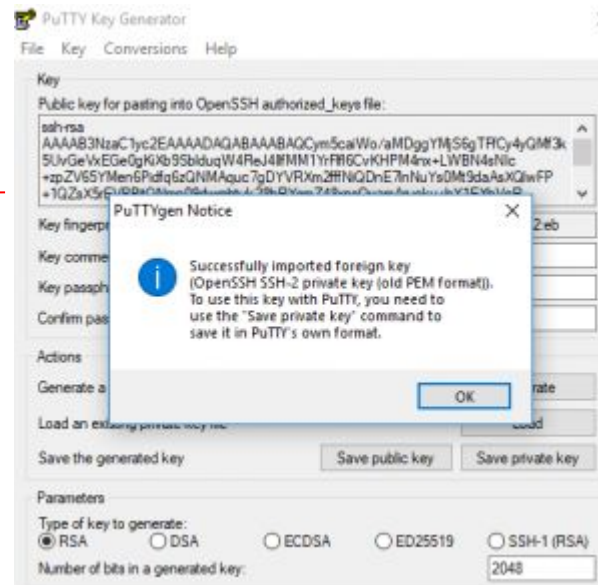
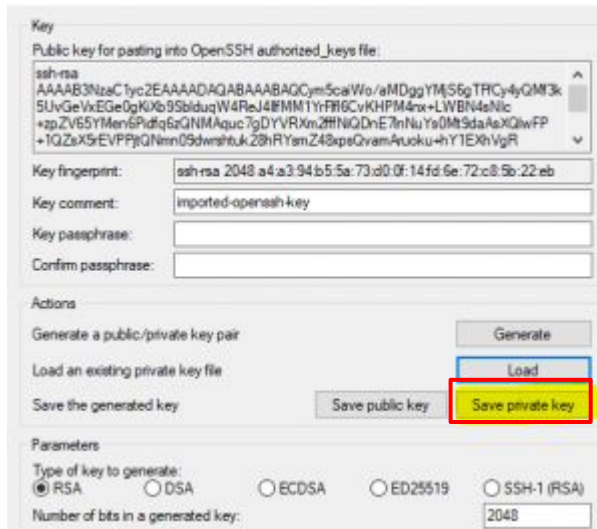
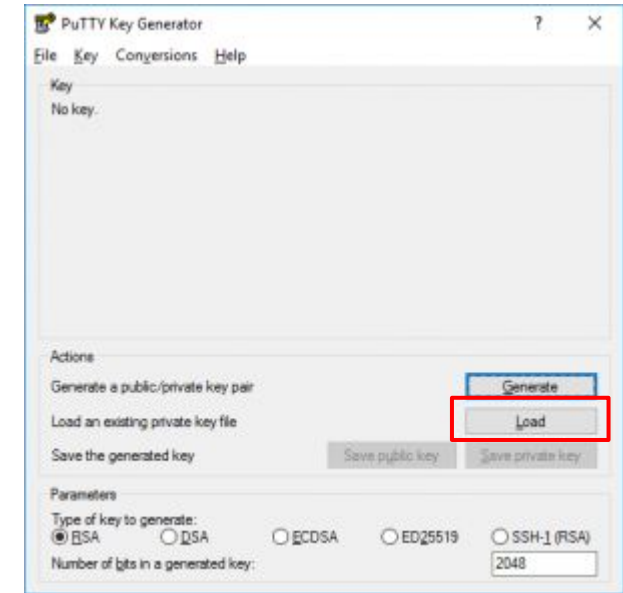
MSI ('Windows Installer')

64-bit x86:	putty-64bit-0.78-installer.msi	(signature)
64-bit Arm:	putty-arm64-0.78-installer.msi	(signature)
32-bit x86:	putty-0.78-installer.msi	(signature)

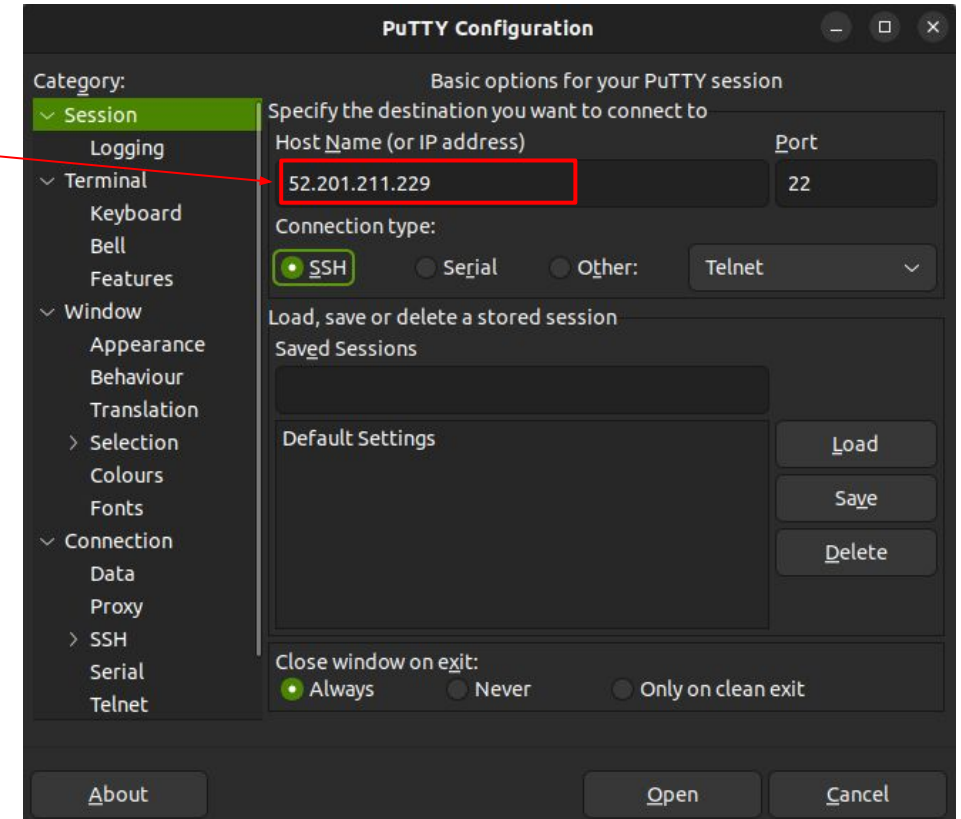
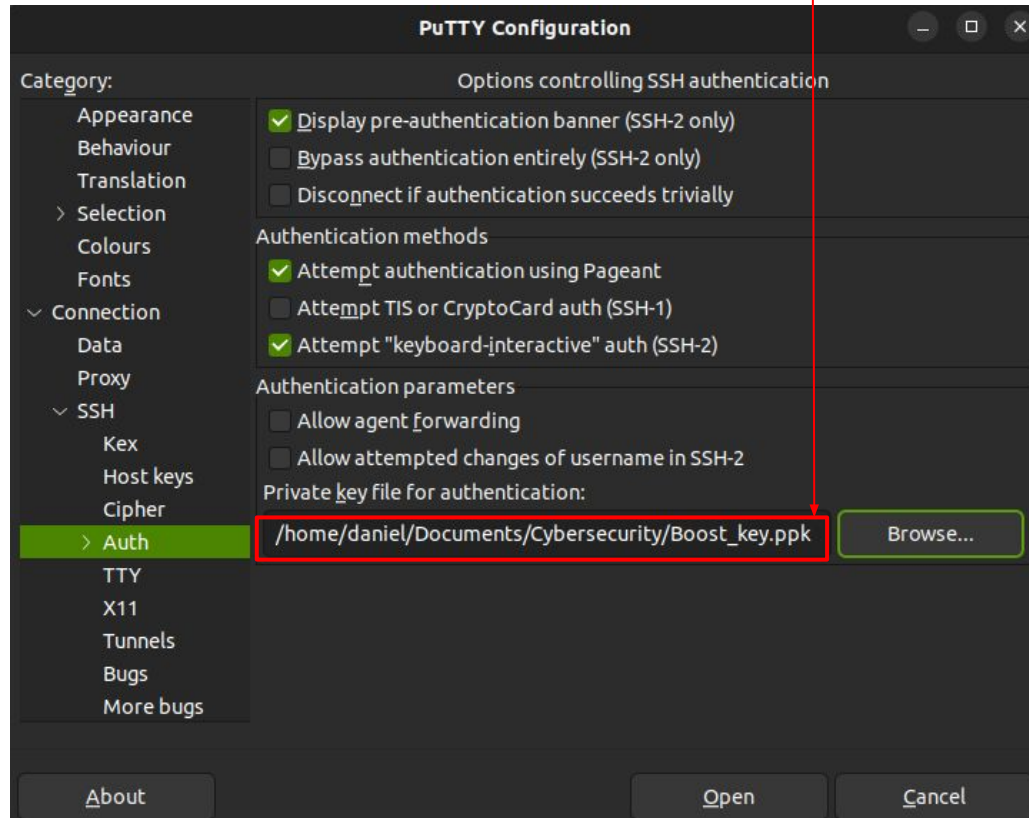
Unix source archive

.tar.gz:	putty-0.78.tar.gz	(signature)
----------	-----------------------------------	-----------------------------

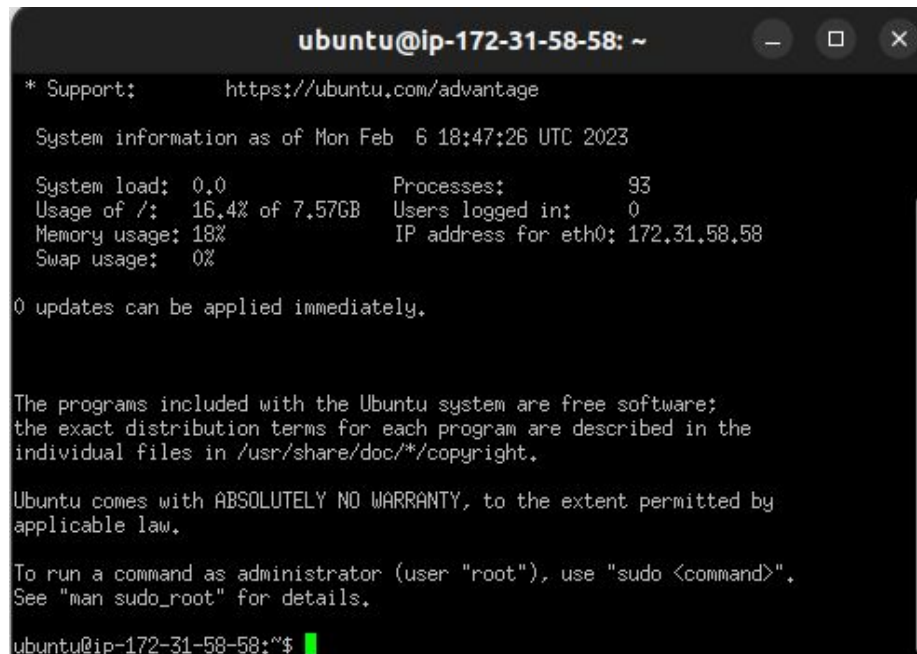
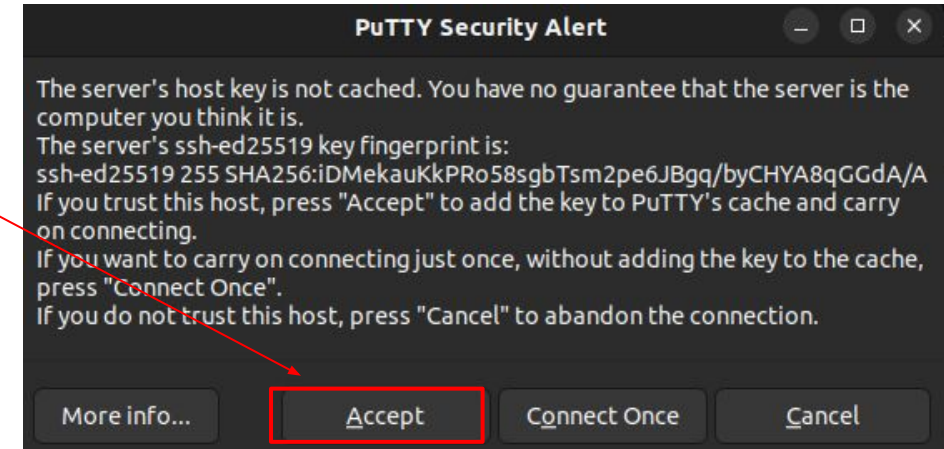
1. Execute Puttygen
2. Click on “Load” and look for the .pem file. Select “All files” to be able to see the .pem file
3. Click on “Save Private Key” to generate a .ppk key. You do not need to generate a passphrase for your key.



1. Execute Putty
2. In the "Session" category put the public IP address of the virtual machine
3. In the "SSH -> Auth" section upload the private key that was just generated (.ppk)



1. Click in the Accept button if a Security Alert is displayed
2. Connect using the user "ubuntu"



Next 2 slides include instructions for Linux users to connect to the virtual machine

Instances (1/2) [Info](#)

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
☐	Mainpage_Mint	i-027afc125962cfa81	Terminated	t2.micro	–	No alarms	us-east-1a	–	–	–
☒	Boost_server	i-0399855eaa1b33346	Running	t2.micro	Initializing	No alarms	us-east-1a	ec2-3-91-222-149.com...	3.91.222.149	–

To do a remote connection to the machine we can select the instance and then click “Connect”

We have different ways to connect to the machine, so we will try to do a SSH connection

Connect to instance [Info](#)

Connect to your instance i-0399855eaa1b33346 (Boost_server) using any of these options

EC2 Instance Connect

Session Manager

SSH client

EC2 serial console

Instance ID
i-0399855eaa1b33346 (Boost_server)

1. Open an SSH client.
2. Locate your private key file. The key used to launch this instance is Boost_key.pem
3. Run this command, if necessary, to ensure your key is not publicly viewable.
chmod 400 Boost_key.pem
4. Connect to your instance using its Public DNS:
ec2-3-91-222-149.compute-1.amazonaws.com

Example:
ssh -i "Boost_key.pem" ubuntu@ec2-3-91-222-149.compute-1.amazonaws.com

Note: In most cases, the guessed user name is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name.

Cancel

First we look for the location where the .pem file (the one that contains the pair key to connect with the server) was saved

Here we change the permissions over the .pem file

Now, we can execute the SSH command and connect with the server

```
ubuntu@ip-172-31-92-252: ~
daniel@HP-ProBook-440-G6: ~/$ cd /home/daniel/OneDrive/
daniel@HP-ProBook-440-G6: ~/OneDrive$ cd UR/Fellow/Project/Dec2/
daniel@HP-ProBook-440-G6: ~/OneDrive/UR/Fellow/Project/Dec2$ ls
Boost_key.pem          Mint_server_Key.pem
'CS6823 Syllabus F22.docx'  Section_A_Fall_2022_roster.csv
daniel@HP-ProBook-440-G6: ~/OneDrive/UR/Fellow/Project/Dec2$ chmod 400 Boost_key.pem
daniel@HP-ProBook-440-G6: ~/OneDrive/UR/Fellow/Project/Dec2$ ssh -i "Boost_key.pem" ubuntu@ec2-3-91-222-149.compute-1.amazonaws.com
The authenticity of host 'ec2-3-91-222-149.compute-1.amazonaws.com (3.91.222.149)' can't be established.
ED25519 key fingerprint is SHA256:a9jhjfy04CN4/q63QcNr9gzqW+XaZvx4If3HQLqPnDQ.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-3-91-222-149.compute-1.amazonaws.com' (ED25519) to the list of known hosts.
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-1084-aws x86_64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

System information as of Fri Dec  2 16:00:00 UTC 2022

System load:  0.0           Processes:            94
Usage of /:   16.1% of 7.57GB Users logged in:      0
Memory usage: 18%          IP address for eth0: 172.31.92.252
Swap usage:   0%

0 updates can be applied immediately.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-92-252: ~$
```

Validate connectivity

Lets to some simple tests to validate our machine may reach other machines in internet

```
ubuntu@ip-172-31-92-252:~$ ping google.com
PING google.com (142.251.16.138) 56(84) bytes of data.
64 bytes from bl-in-f138.1e100.net (142.251.16.138): icmp_seq=1 ttl=49 time=1.56 ms
64 bytes from bl-in-f138.1e100.net (142.251.16.138): icmp_seq=2 ttl=49 time=1.57 ms
64 bytes from bl-in-f138.1e100.net (142.251.16.138): icmp_seq=3 ttl=49 time=1.57 ms
64 bytes from bl-in-f138.1e100.net (142.251.16.138): icmp_seq=4 ttl=49 time=1.72 ms
64 bytes from bl-in-f138.1e100.net (142.251.16.138): icmp_seq=5 ttl=49 time=3.78 ms
64 bytes from bl-in-f138.1e100.net (142.251.16.138): icmp_seq=6 ttl=49 time=1.60 ms
```

Now, lets try if we can “ping” some of the IPs that belong to our AWS instance:

EC2 > Instances > i-0399855eaa1b33346

Instance summary for i-0399855eaa1b33346 (Boost_server) Info
Updated less than a minute ago

Instance ID
I-0399855eaa1b33346 (Boost_server)

IPv6 address
-

Hostname type
IP name: ip-172-31-92-252.ec2.internal

Public IPv4 address
3.91.222.149 | [open address](#)

Instance state
Running

Private IP DNS name (IPv4 only)
ip-172-31-92-252.ec2.internal

Private IPv4 addresses
172.31.92.252

Public IPv4 DNS
ec2-3-91-222-149.compute-1.amazonaws.com | [open address](#)

```
daniel@HP-ProBook-440-G6:~/OneDrive/UR/Fellow/Project/Dec2$ ping 172.31.92.252
PING 172.31.92.252 (172.31.92.252) 56(84) bytes of data.
^C
--- 172.31.92.252 ping statistics ---
7 packets transmitted, 0 received, 100% packet loss, time 6150ms

daniel@HP-ProBook-440-G6:~/OneDrive/UR/Fellow/Project/Dec2$
```

Nop, we are not able to reach this IP. Why?

```
daniel@HP-ProBook-440-G6:~/OneDrive/UR/Fellow/Project/Dec2$ ping 3.91.222.149
PING 3.91.222.149 (3.91.222.149) 56(84) bytes of data.
^C
--- 3.91.222.149 ping statistics ---
13 packets transmitted, 0 received, 100% packet loss, time 12271ms

daniel@HP-ProBook-440-G6:~/OneDrive/UR/Fellow/Project/Dec2$
```

This neither. Why?

What we have learnt until now?

- How to create an AWS instance
- No usar Telnet ni HTTP
- Existencia de protocolos ICMP, HTTP (80), HTTPS (443), SSH (22)
- Cloud composed by linux servers
- Create inbound rules
- How work outbound rules: outbound rules only control traffic that start from the virtual machine, not traffic started from users.
- “Return traffic” will be allowed if in the inbound rule I am allowing the incoming traffic.



Thank you
