

# **Instituto Superior de Engenharia de Lisboa**

**Área Departamental de Engenharia de Eletrónica e Telecomunicações e de Computadores**

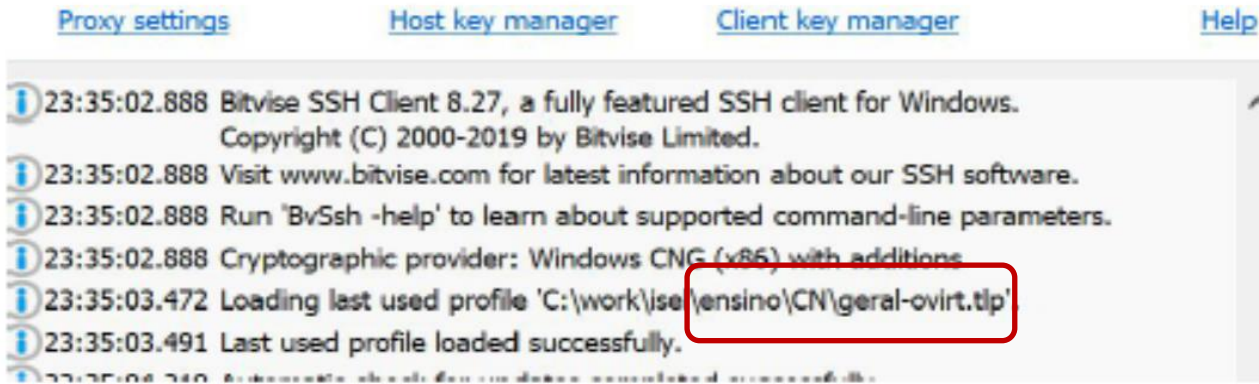
**Mestrado em Engenharia Informática e de Computadores (MEIC)**

**Mestrado em Engenharia Informática e Multimédia (MEIM)**

## **Criação de Virtual Machines na Google Cloud Platform (GCP)**

- **As máquinas virtuais GCP são acedidas via SSH com autenticação de chave pública e privada.**
- **Os passos seguintes mostram como gerar um par de chaves pública/privada com o cliente SSH **Bitvise em Windows**.  
(<https://www.bitvise.com/ssh-client-download>)**
- ***Para outros sistemas operativos, e outros clientes SSH, consulte as instruções em <https://www.ssh.com/ssh/keygen/>, onde são usadas ferramentas de linha de comando para produzir o mesmo resultado.***

## No cliente Bitvise aceda a "Client Key Manager"



Repositório *Global* e  
algoritmo RSA com 2048 bit

## Na zona inferior da janela, escolha "Generate New"

Escolha uma password para proteger a chave privada, ou deixe em branco. **Na caixa de comentário** ("Comment") indique um identificador com um formato tipo email. Sugere-se usar nome do grupo seguido de **@cd.isel.pt**.



Entrar na consola GCP no browser com o login gmail que usou na criação da conta GCP, com cupão de \$50, e verifique que tem o projeto seleccionado (neste caso do Grupo 12)

Na primeira vez aparece a opção para fazer *Enable*



Compute Engine API

[Google Enterprise API](#)

Compute Engine API

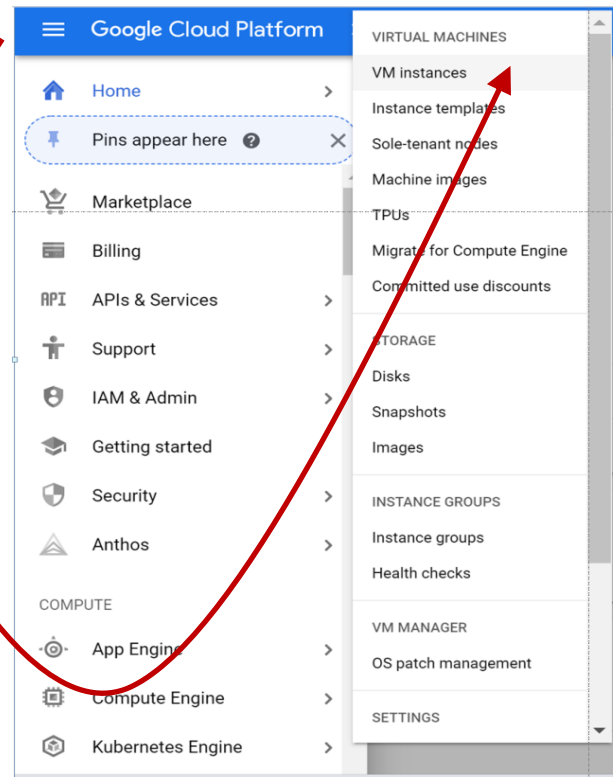
ENABLE

TRY THIS API [↗](#)

Google Cloud Platform CD2021-G12 ▼

Em menu de serviços disponível

Selecionar *Compute engine* e depois



Selecionar VM instances

Compute Engine VM instances

Compute Engine lets you use virtual machines that run on Google's infrastructure. Create micro-VMs or larger instances running Debian, Windows, or other standard images. Create your first VM instance, import it using a migration service, or try the quickstart to build a sample app.

Create

or Import

or

Take the quickstart

Name \*  
vm-centos8-java11

#### MANAGE TAGS AND LABELS

Region \*  
europe-southwest1 (Madrid) ?  
Zone \*  
europe-southwest1-a ?  
Region is permanent  
Zone is permanent

## Machine configuration

General purpose Compute-optimised **NEW** Memory-optimised GPUs

Machine types for common workloads, optimised for cost and flexibility

	Series ?	Description	vCPUs ?	Memory ?	Platform
<input type="radio"/>	C3	Consistently high performance	4 - 176	8 - 1,408 GB	Intel Sapphir
<input checked="" type="radio"/>	E2	Low-cost day-to-day computing	0.25 - 32	1 - 128 GB	Based on av
<input type="radio"/>	N2	Balanced price and performance	2 - 128	2 - 864 GB	Intel Cascad
<input type="radio"/>	N2D	Balanced price and performance	2 - 224	2 - 896 GB	AMD EPYC
<input type="radio"/>	T2A	Scale-out workloads	1 - 48	4 - 192 GB	Ampere Altr
<input type="radio"/>	T2D	Scale-out workloads	1 - 60	4 - 240 GB	AMD EPYC
<input type="radio"/>	N1	Balanced price and performance	0.25 - 96	0.6 - 624 GB	Intel Skylake

### Machine type

Choose a machine type with preset amounts of vCPUs and memory that suit most workloads.  
Or, you can create a custom machine for your workload's particular needs. [Learn more](#)

PRESET CUSTOM

e2-small (2 vCPU, 1 core, 2 GB memory)



vCPU


0.5-2 vCPU (1 shared core)

Memory

2 GB

Por questões de custos,  
recomenda-se usar a série E2  
com *machine type* e2-small

## Boot disk ?

Name	vm-centos8-java11
Type	New balanced persistent disk
Size	10 GB
License type ?	Free
Image	 Debian GNU/Linux 11 (bullseye)

CHANGE

### Boot disk

**Selecione linux CentOS versão Stream 8**

Select an image or snapshot to create a boot disk; or attach an existing disk. Can't find w

Public images

Custom images

Snapshots

Existing disks

Operating system

CentOS

Version

CentOS Stream 8

x86\_64 built on 20201014, supports Shielded VM features ?

Boot disk type ?

Standard persistent disk

Size (GB) ?

20

## Firewall ?

Add tags and firewall rules to allow specific network traffic from the Internet

- ☒ Allow HTTP traffic
- ☒ Allow HTTPS traffic

abrir no firewall  
portas http (80) e https (443)

Management, **security**, disks, networking, sole tenancy

**Em Security devem colocar as chaves públicas dos elementos do grupo para que cada aluno possa ter terminais ligados à VM usando Apps cliente SSH (Secure Shell) que usam a chave pública guardada no ficheiro criada previamente**

### Add manually generated SSH keys

Add your own keys for VM access through a 3rd-party tool. You cannot use these keys when IAM-based access (using OS Login) is enabled. [Learn more](#)

Management **Security** Disks Networking Sole Tenancy

#### Shielded VM ?

Turn on all settings for the most secure configuration.

- ☐ Turn on Secure Boot ?
- ☒ Turn on vTPM ?
- ☒ Turn on Integrity Monitoring ?

#### SSH Keys

These keys allow access only to this instance, unlike [project-wide SSH keys](#) [Learn more](#)

- ☐ Block project-wide SSH keys  
When checked, project-wide SSH keys cannot access this instance [Learn more](#)

+ ADD ITEM

CD2021-GXX

```
ejrrEtYZtyM2T0LLrd03aU3JxX9y4fF8eoPWy3CFs
Z6s9SCJXdGiUWeYbTafw8B0iImg5ntq1wniWdd5d9
YVar1w/egf7mFTxJk+KYyOtFKtKw0IRRzq7k4W1BU
AebIX3HaJ97VXL+53K09cnHbN9DvI229kHHUfrbd
D/ura/WD1HUwKeBxc/tU2bePyVLjDqjM20mja7m+
m4Cj26iu0eV28J99+U7fTTDDRdJZl0M56vEq/ixHh
SPm1XW58hPzd CD2021-GXX@cd.ise1.pt
```

+ Add item

**inserir mais que uma chave pública**

You will be billed for this instance. (

Create

Cancel

**Click para criar a VM**



**IP público da VM**

<input type="checkbox"/> Name ^	Zone	Recommendation	In use by	Internal IP	External IP	Connect
<input checked="" type="checkbox"/> vm-centos8-java11	europe-west2-c			10.154.0.2 (nic0)	34.89.65.182 ↗	<b>SSH</b> ⋮

**related Actions**

**View Billing Report**  
View and manage your Compute Engine billing

**Monitor VMs**  
View outlier VMs across metrics like CPU and Network

**Explore VM Logs**  
View, search, analyze, and download VM instance logs

**Setup Firewall Rules**  
Control traffic to and from a VM instance

Start / Resume

Stop

Suspend

Reset

Delete

View network details

New machine image

View logs

View monitoring

Dismiss

Instances

**Acesso imediato com terminal SSH no próprio browser**

```
lassuncao_cn1920@vm-centos8-java11:~ - Google Chrome
ssh.cloud.google.com/projects/cd2021-g12/zones/europe-west2-c/instances/vm-centos8-java11?...
Connected, host fingerprint: ssh-rsa 0 FA:B1:53:58:48:78:5A:26:79:EE:16:41:D0:E2
:0C:94:9B:DB:E2:DD:19:31:F4:98:32:45:E4:D8:D3:E1:74:96
[lassuncao_cn1920@vm-centos8-java11 ~]$ pwd
/home/lassuncao_cn1920
[lassuncao_cn1920@vm-centos8-java11 ~]$
```

# Acesso com cliente SSH Bitvise

nome na public key  
configurada na  
VM GCP

IP público da VM

Bitvise SSH Client 8.26

Profile: bitwiseVmcentos8-j11.tlp (changed)

Load profile  
Save profile  
Save profile as  
New profile  
Close profile

Login Options Terminal RDP SFTP Services C2S S2C SSH Notes About

Server  
Host: 34.89.65.182  
Port: 22  
Enable obfuscation  
Obfuscation keyword

Authentication  
Username: CD2021-GXX  
Initial method: publickey  
Client key: Global 6  
Passphrase  
Elevation: Default

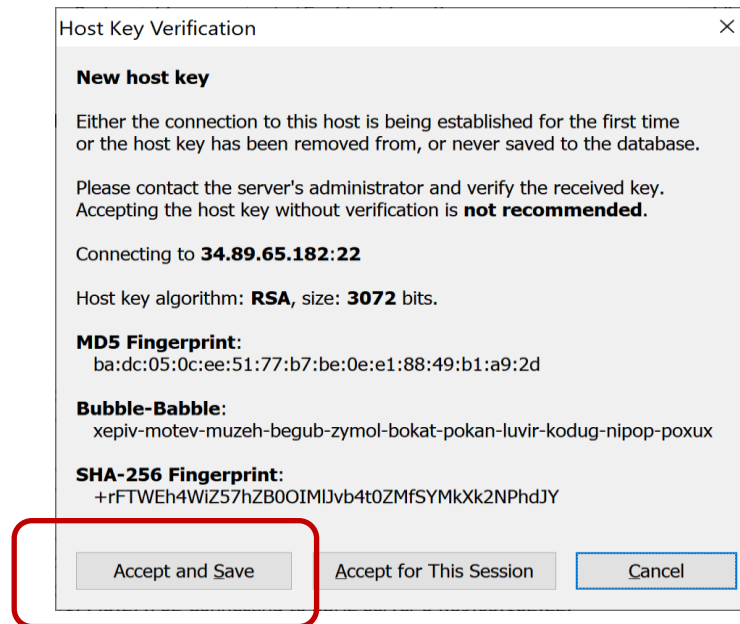
Kerberos  
SPN  
GSS/Kerberos key exchange  
Request delegation  
gssapi-keyex authentication

Proxy settings Host key manager Client key manager Help

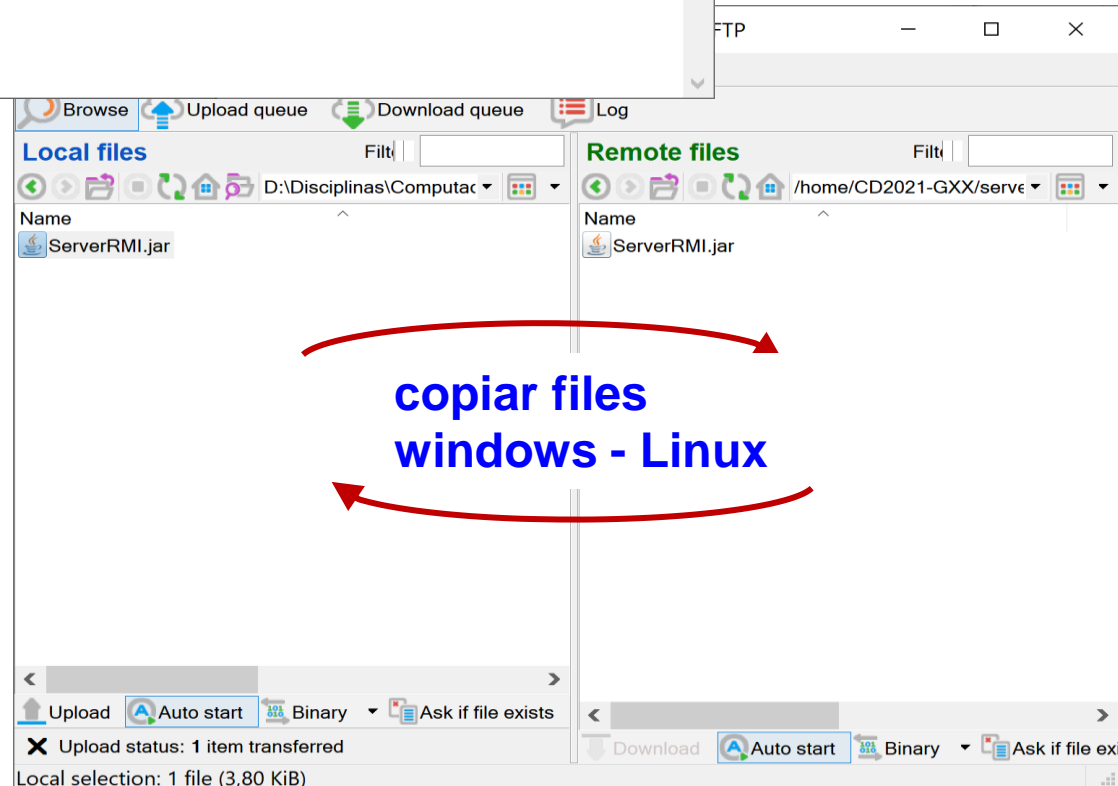
Log in Exit

posição no  
repositório  
de keys

# Aceitar a associação da chave pública do servidor CentOS ao IP da VM



```
bitwiseVmcentos8-j11.tlp - CD2021-GXX@34.89.65.182:22 - Bitvise xterm - CD2021-GXX@vm-c...  
[CD2021-GXX@vm-centos8-java11 ~]$ pwd  
/home/CD2021-GXX  
[CD2021-GXX@vm-centos8-java11 ~]$ cd serverRMI/  
[CD2021-GXX@vm-centos8-java11 serverRMI]$ ls  
ServerRMI.jar  
[CD2021-GXX@vm-centos8-java11 serverRMI]$
```



# instalar Java 11

`sudo yum install java-11-openjdk-devel`

```
bitwiseVmcentos8-j11.tlp - CD2021-GXX@34.89.65.182:22 - Bitwise xterm - CD2021-GXX@vm-cento...  
libwayland-cursor-1.17.0-1.el8.x86_64  
libwayland-egl-1.17.0-1.el8.x86_64  
libxcb-1.13.1-1.el8.x86_64  
lksctp-tools-1.0.18-3.el8.x86_64  
lua-5.3.4-11.el8.x86_64  
pango-1.42.4-6.el8.x86_64  
pixman-0.38.4-1.el8.x86_64  
pkgconf-1.4.2-1.el8.x86_64  
pkgconf-m4-1.4.2-1.el8.noarch  
pkgconf-pkg-config-1.4.2-1.el8.x86_64  
rest-0.8.1-2.el8.x86_64  
ttmkfdir-3.0.9-54.el8.x86_64  
tzdata-java-2020d-1.el8.noarch  
xorg-x11-font-utils-1:7.5-40.el8.x86_64  
xorg-x11-fonts-Type1-7.5-19.el8.noarch  
  
Complete!  
[CD2021-GXX@vm-centos8-java11 ~]$ java -version  
openjdk version "11.0.9" 2020-10-20 LTS  
OpenJDK Runtime Environment 18.9 (build 11.0.9+11-LTS)  
OpenJDK 64-Bit Server VM 18.9 (build 11.0.9+11-LTS, mixed mode, sharing)  
[CD2021-GXX@vm-centos8-java11 ~]$
```

Google Cloud Platform CD2021-G12 Search products and resources

VPC network

VPC networks

External IP addresses

Firewall

Create a firewall rule

Firewall rules control incoming or outgoing traffic to an instance. By default, incoming traffic from outside your network is blocked. [Learn more](#)

Name  
open-all-ports

Lowercase letters, numbers, hyphens allowed

Definir regra de Firewall para abrir portas tcp entre 5000 a 9000

aplica-se a todas as instâncias de VM

permite acesso de todos os IPs

Targets  
All instances in the network

Source filter  
IP ranges

Source IP ranges \*  
0.0.0.0/0 for example, 0.0.0.0/0, 192.168.2.0/24

Second source filter  
None

Protocols and ports  
☐ Allow all  
☒ Specified protocols and ports

☒ tcp : 5000-9000

☐ udp : all

☐ Other protocols  
protocols, comma separated, e.g. ah, sctp

DISABLE RULE

CREATE

CANCEL