

Используем GPU на Google Cloud

(бесплатно, но нужна карта)

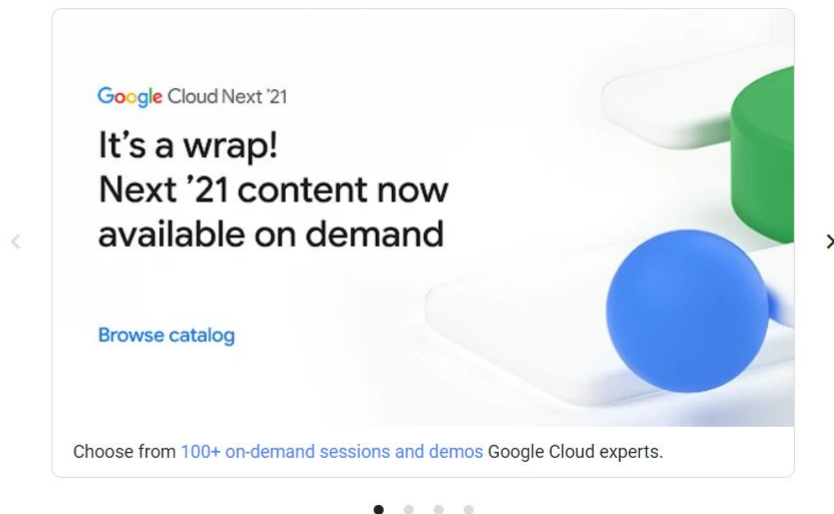
New customers get \$300 in free credits to spend on Google Cloud. All customers get free usage of 20+ products. [See offer details.](#)

Accelerate your transformation with Google Cloud

Build apps faster, make smarter business decisions, and connect people anywhere.

Get started for free

Contact sales



Переходим на сайт <https://cloud.google.com/>
и видим вот такую картину, жмём
Get started for free

 Try Google Cloud for free

Step 1 of 3 Account Information



Ваши имя и почта

[SWITCH ACCOUNT](#)

Country

Russia

What best describes your organization or needs?

Please select

Class project / assignment

Terms of Service

☒ I agree to the [Google Cloud Platform Terms of Service](#), and the terms of service of [any applicable services and APIs](#). I have also read and agree to the [Google Cloud Platform Free Trial Terms of Service](#).

Required to continue

Email updates

☐ I would like to receive periodic emails on news, product updates and special offers from Google Cloud and Google Cloud Partners.

CONTINUE

Access to all Cloud Platform Products

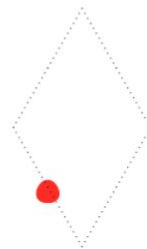
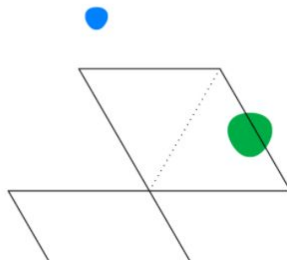
Get everything you need to build and run your apps, websites and services, including Firebase and the Google Maps API.

\$300 credit for free

Put Google Cloud to work with \$300 in credit to spend over the next 90 days.


No autocharge after free trial ends

We ask you for your credit card to make sure you are not a robot. You won't be charged unless you manually upgrade to a paid account.



Step 2 of 3 Identity Verification and Contact Information

We'll send a text message with a 6-digit code to verify your identity and confirm where we can reach you about solutions to support your Cloud experience. Standard rates apply.

 Phone number
Ваш номер телефона

SEND CODE

[Privacy policy](#) | [FAQs](#)

Access to all Cloud Platform Products

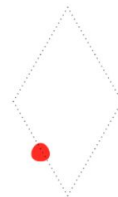
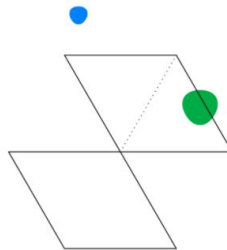
Get everything you need to build and run your apps, websites and services, including Firebase and the Google Maps API.

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Вводим телефон, ждём код и вписываем.

Step 3 of 3 Payment Information Verification

Your payment information helps us reduce fraud and abuse. **You won't be charged unless you turn on automatic billing.**

Customer info



Account type ⓘ

Business



Name and address ⓘ ✎

Moscow State University

Тут ваши данные

Leninskie Gory, Moscow

Moscow

Moskva

Russia

119991



Primary contact ⓘ ✎

**Тут ваши
данные**

How you pay



Monthly automatic payments

You pay for this service on a regular monthly basis, via an automatic charge when your payment is due.

Payment method ⓘ

Card number

#

MM

YY

CVC



Cardholder name

DIGITAL CARD

☒ Credit or debit card address is same as above

START MY FREE TRIAL

[Privacy policy](#) | [FAQs](#)

Access to all Cloud Platform Products

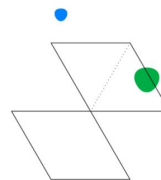
Get everything you need to build and run your apps, websites and services, including Firebase and the Google Maps API.

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No autocharge after free trial ends

We ask you for your credit card to make sure you are not a robot. You won't be charged unless you manually upgrade to a paid account.



Вписываем данные карты.
Советую завести **виртуальную карту от Сбербанка**, чтобы перестраховаться от внезапных снятий (их быть не должно)

Your free trial includes \$300 in credit to spend over the next 90 days. To help us serve you better, please answer 4 questions.

✓ What best describes your organization or needs?

✓ What brought you to Google Cloud?

✓ What are you interested in doing with Google Cloud?

4 What best describes your role?

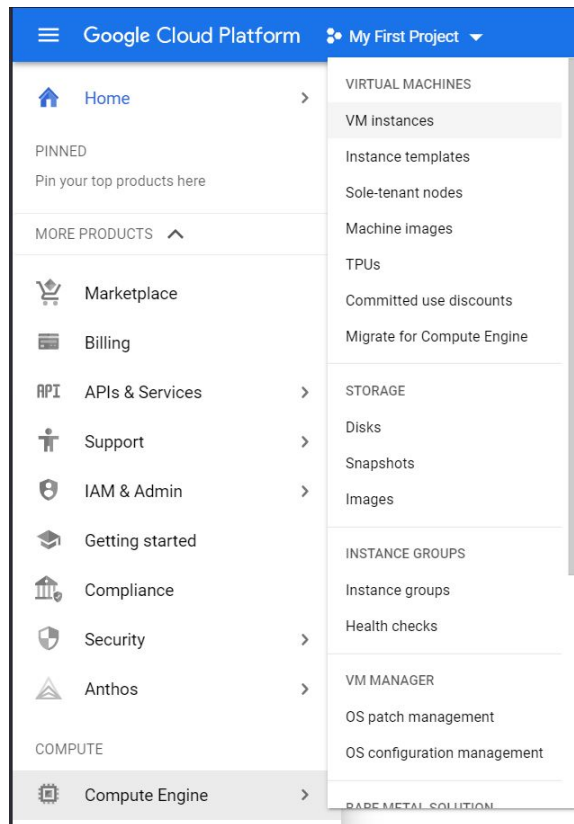
Please select *

Data Scientist / Data Engineer



CLOSE


DONE


Тут выбираем штуки, вполне очевидно.



Дальше жмём на 3 полоски в верхнем углу, выбираем **Compute Engine** и далее **VM instances**

 Google Cloud Platform  My First Project ▼





Compute Engine API

Google Enterprise API

Compute Engine API

[ENABLE](#) [TRY THIS API !\[\]\(b55dc21f01b8c1c4b399715fd68cdb5d_img.jpg\)](#)

[OVERVIEW](#) [DOCUMENTATION](#) [SUPPORT](#)

Тут просто **Enable**

Google Cloud Platform

My First Project

Search products and resources

1

Compute Engine

VM instances

CREATE INSTANCE

IMPORT VM

REFRESH

START / RESUME

OPERATIONS

HELP ASSISTANT

HIDE INFO PANEL

Virtual machines

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed use discounts

Migrate for Compute Engi...

Storage

Disks

Snapshots

Images

Marketplace

Release Notes

<1

Filter

Enter property name or value

?

III

☐

Status

Name

Zone

Recommendations

In use by

Internal IP

Connect

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 INSTANCE

TAKE THE QUICKSTART

Select an instance

PERMISSIONS

LABELS

MONITORING

Please select at least one resource.

Мы зашли на страницу, где нужно создавать VM, но перед тем как их создавать, **нужно повесить квоту на GPU**, потому что иначе не даст создать нужную машину.

Переходим по ссылке ниже и видим табличку с различными квотами.

<https://console.cloud.google.com/iam-admin/quotas>

Quotas EDIT QUOTAS						
<div><div>Near the limit 0 View quotas</div><div>Low usage 5,147 View quotas</div><div>All quotas 5,365</div></div>						
<div><div><div>Filter</div><div>Enter property name or value</div></div><div><div></div><div></div></div></div>						
<input type="checkbox"/>	Service	Quota	Dimensions (e.g. location)	Limit	Current usage percentage ↓	7 day peak usage percentage
<input type="checkbox"/>	Compute Engine API	Networks		5	<div><div></div></div> 20%	<div><div></div></div> 20%
<input type="checkbox"/>	Compute Engine API	Subnetworks		100	<div><div></div></div> 17%	<div><div></div></div> 17%
<input type="checkbox"/>	Compute Engine API	Instance List Referrer requests per 100 seconds		4,000	<div><div></div></div> 3.67%	<div><div></div></div> 3.67%
<input type="checkbox"/>	Compute Engine API	Firewall rules		100	<div><div></div></div> 2%	<div><div></div></div> 2%
<input type="checkbox"/>	Compute Engine API	Heavy-weight read requests per 100 seconds		1,000	<div><div></div></div> 1.67%	<div><div></div></div> 1.67%
<input type="checkbox"/>	Compute Engine API	Routes		200	<div><div></div></div> 0.5%	<div><div></div></div> 0.5%

Free trial status: P21,070.67 credit and 91 days remaining - with a full account, you'll get unlimited access to all of Google Cloud Platform. DISMISS ACTIVATE

Google Cloud Platform My First Project Search products and resources

IAM & Admin

- IAM
- Identity & Organization
- Policy Troubleshooter
- Policy Analyzer
- Organization Policies
- Service Accounts
- Workload Identity Federat...
- Labels
- Tags
- Settings
- Privacy & Security
- Manage Resources
- Release Notes

Quotas [EDIT QUOTAS](#)

Near the limit
0
[View quotas](#)

Low usage
5,147
[View quotas](#)

All quotas
5,365

Filter Quota : GPUs (all regions) Enter property name or value

<input type="checkbox"/>	Service	Quota	Dimensions (e.g. location)	Limit	Current usage percentage	7 day peak usage percentage
<input type="checkbox"/>	Compute Engine API	GPUs (all regions)		0	0%	0%

Пишем в фильтре `GPUs (all regions)` и нажимаем **Enter**, чтобы найти нужную квоту.

Жмём на кнопку **Activate** сверху, чтобы сделать полный аккаунт

Activate your full account



Keep your cloud running uninterrupted



Keep any remaining credits to spend during your Free Trial



Pay only for what you use—automatic billing starts once your Free Trial ends

CANCEL

ACTIVATE

Делаем полный аккаунт, т.к. без него не даст повысить квоту на GPU.

После нажатия **Activate** нас возвращает обратно, там нужно обновить страницу

IAM & Admin

Quotas [EDIT QUOTAS](#)

Near the limit
0
[View quotas](#)

Low usage
5,147
[View quotas](#)

All quotas
5,365

Filter **Quota : GPUs (all regions)** Enter property name or value

<input checked="" type="checkbox"/>	Service	Quota	Dimensions (e.g. location)	Limit	Current usage percentage ↓	7 day peak usage percentage
<input checked="" type="checkbox"/>	Compute Engine API	GPUs (all regions)		0	0%	0%

Выделяем квоту галочкой и жмем Edit Quotas сверху.

The screenshot shows the Google Cloud Platform interface. On the left is a navigation menu with categories like IAM & Admin, IAM, Identity & Organization, Policy Troubleshooter, Policy Analyzer, Organization Policies, Service Accounts, Workload Identity Federat..., Labels, Tags, Settings, Privacy & Security, Identity-Aware Proxy, Manage Resources, and Release Notes. The main area is titled 'Quotas' with an 'EDIT QUOTAS' link. It displays three summary cards: 'Near the limit' (0), 'Low usage' (5,147), and 'All quotas' (5,365). Below these is a table of quotas. A filter is set to 'Quota : GPUs (all regions)'. The table has columns for 'Service', 'Quota', 'Dimensions (e.g. location)', 'Limit', and 'Current'. One quota is listed: 'Compute Engine API' for 'GPUs (all regions)' with a limit of 0. A modal window on the right, titled '1 quota selected', shows the 'Quota changes' for 'Compute Engine API'. It includes a 'New limit' input field with the value '1' and a 'Request description' text area containing the text 'I need 1 GPU to complete my university homework.' A red arrow points from the text below to the 'New limit' input field. The modal also has a 'DONE' button and a 'NEXT' button at the bottom.

Service	Quota	Dimensions (e.g. location)	Limit	Current
✓	Compute Engine API	GPUs (all regions)	0	

Выставляем новый лимит 1 и пишем какое-нибудь описание. Скорее всего его нигде не смотрят, но лучше написать правдоподобное :)

Дальше вводим телефон и ждём подтверждения на почту, что квота увеличилась

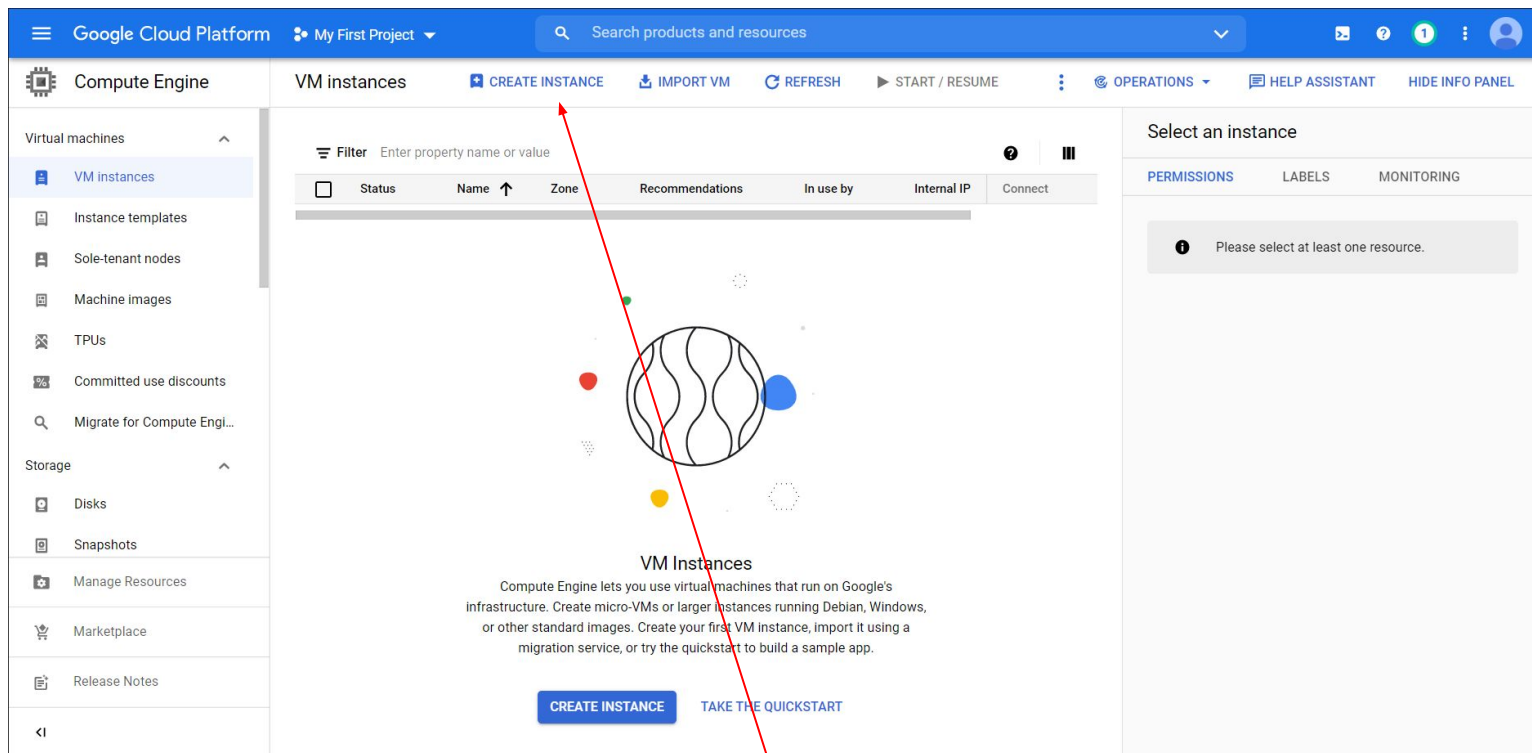
Quotas EDIT QUOTAS						
<div> <div>Near the limit 0 View quotas</div> <div>Low usage 5,147 View quotas</div> <div>All quotas 5,365</div> </div>						
<div> <div>Filter</div> <div>Quota : GPUs (all regions)</div> <div>Enter property name or value</div> <div>×</div> <div>?</div> <div>☰</div> </div>						
<input type="checkbox"/>	Service	Quota	Dimensions (e.g. location)	Limit	Current usage percentage ↓	7 day peak usage percentage
<input type="checkbox"/>	Compute Engine API	GPUs (all regions)		1	<div><div></div></div> 0%	<div><div></div></div> 0%



Наша квота повысилась и теперь мы можем
создать VM с GPU.

Переходим по ссылке:

<https://console.cloud.google.com/compute/instances>



The screenshot displays the Google Cloud Platform console interface. The top navigation bar includes the Google Cloud Platform logo, the project name 'My First Project', a search bar, and user account information. The left sidebar shows the 'Compute Engine' section with various options like 'Virtual machines', 'Instance templates', and 'Machine images'. The main content area is titled 'VM instances' and features a 'CREATE INSTANCE' button in the top navigation bar. Below this, there is a table with columns for 'Status', 'Name', 'Zone', 'Recommendations', 'In use by', 'Internal IP', and 'Connect'. A large graphic of a globe with wavy lines is centered on the page, with the text 'VM Instances' and a description below it. At the bottom, there are two buttons: 'CREATE INSTANCE' and 'TAKE THE QUICKSTART'. A red arrow points from the 'CREATE INSTANCE' button in the top navigation bar to the 'CREATE INSTANCE' button at the bottom of the page.

Google Cloud Platform My First Project Search products and resources

Compute Engine VM instances CREATE INSTANCE IMPORT VM REFRESH START / RESUME OPERATIONS HELP ASSISTANT HIDE INFO PANEL

Virtual machines VM instances Instance templates Sole-tenant nodes Machine images TPUs Committed use discounts Migrate for Compute Eng...

Storage Disks Snapshots Manage Resources Marketplace Release Notes

Filter Enter property name or value

Status	Name	Zone	Recommendations	In use by	Internal IP	Connect
--------	------	------	-----------------	-----------	-------------	---------

Select an instance

PERMISSIONS LABELS MONITORING

Please select at least one resource.

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 INSTANCE TAKE THE QUICKSTART

Жмём Create Instance

Google Cloud Platform My First Project Search products and resources

Create an instance

HELP ASSISTANT

To create a VM instance, select one of the options:

- New VM instance**
Create a single VM instance from scratch
- New VM instance from template
Create a single VM instance from an existing template
- New VM instance from machine image
Create a single VM instance from an existing machine image
- Marketplace
Deploy a ready-to-go solution onto a VM instance

Name *
instance-1

Labels
+ ADD LABELS

Region *
europe-west1 (Belgium) Region is permanent

Zone *
europe-west1-d Zone is permanent

Machine configuration

Machine family

GENERAL-PURPOSE COMPUTE-OPTIMIZED MEMORY-OPTIMIZED

Machine types for common workloads, optimized for cost and flexibility

Series
N1

Powered by Intel Skylake CPU platform or one of its predecessors

Monthly estimate
\$278.09
That's about \$0.38 hourly
You have \$21,070.67 free trial credits remaining
Pay for what you use: No upfront costs and per second billing

DETAILS

Выбираем **регион, зону**
(регион какой-нибудь европейский и зону не первую в списке)
и тип машины **N1**

От региона **может зависеть цена**, лучше выбирать, чтобы не превышало 300\$
Также регион может быть загружен в данный момент и придется **выбрать другой регион/зону или подождать**

Machine configuration

Machine family


GENERAL-PURPOSE COMPUTE-OPTIMIZED MEMORY-OPTIMIZED

Machine types for common workloads, optimized for cost and flexibility

Series
N1

Powered by Intel Skylake CPU platform or one of its predecessors

Machine type
n1-highmem-2 (2 vCPU, 13 GB memory)

	vCPU	Memory
	2	13 GB

CPU platform
Intel Skylake or later

GPUs

The number of attached GPUs affects the VM's maximum number of memory and CPUs.
[Learn More](#)

GPU type
NVIDIA Tesla T4

Number of GPUs
1

☐ Enable Virtual Workstation (NVIDIA GRID)

[^ CPU PLATFORM AND GPU](#)

Дальше выбираем вот такие настройки, чтобы хватило памяти и GPU, При таких настройках итоговая стоимость должна получаться в районе \$250 в месяц, чтобы случайно не перейти за 300\$ пробных.

[^ CPU PLATFORM AND GPU](#)

Display device

Enable to use screen capturing and recording tools.

☐ Enable display device

Confidential VM service ?


☐ Enable the Confidential Computing service on this VM instance.

Container ?

Deploy a container image to this VM instance

DEPLOY CONTAINER

Boot disk ?

Type	New balanced persistent disk
Size	10 GB
Image	 Debian GNU/Linux 10 (buster)

CHANGE

Выбираем раздел **Boot disk** и жмём кнопку **Change**

The screenshot shows the Google Cloud Platform console interface. On the left, the 'Create an instance' sidebar is visible with options: 'New VM instance', 'New VM instance from template', 'New VM instance from machine image', and 'Marketplace'. The main area shows the 'Boot disk' configuration modal. The modal has tabs for 'PUBLIC IMAGES', 'CUSTOM IMAGES', 'SNAPSHOTS', and 'EXISTING DISKS'. Under 'PUBLIC IMAGES', the 'Operating system' is set to 'Deep Learning on Linux' and the 'Version' is 'Deep Learning Image: PyTorch 1.10 and fastai m86 CUDA 110'. The 'Boot disk type' is 'Balanced persistent disk' and the 'Size (GB)' is '50'. There is a 'SHOW ADVANCED CONFIGURATION' link and 'SELECT' and 'CANCEL' buttons at the bottom.

Google Cloud Platform My First Project

Create an instance

To create a VM instance, select one of the options:

- New VM instance
Create a single VM instance from scratch
- New VM instance from template
Create a single VM instance from an existing template
- New VM instance from machine image
Create a single VM instance from an existing machine image
- Marketplace
Deploy a ready-to-go solution onto a VM instance

CPU PLATFORM

Display device

Enable to use screen

Enable display acceleration

Confidential VM

Enable the Confidential VM

Container

Deploy a container

DEPLOY CONTAINER

Boot disk

Type

Size

Image

CHANGE

Identity and access

Service account

Boot disk

Select an image or snapshot to create a boot disk; or attach an existing disk. Can't find what you're looking for? Explore hundreds of VM solutions in [Marketplace](#)

PUBLIC IMAGES CUSTOM IMAGES SNAPSHOTS EXISTING DISKS

Operating system

Deep Learning on Linux

Version *

Deep Learning Image: PyTorch 1.10 and fastai m86 CUDA 110

A debian-10 Linux based image with PyTorch 1.10 pre-installed.

Boot disk type *

Balanced persistent disk

Size (GB) *

50

SHOW ADVANCED CONFIGURATION

SELECT CANCEL

Выбираем вот такие настройки в разделе **Boot disk**, чтобы при заходе на машину не ставить драйвера на **GPU** и библиотеки для ML.

CHANGE

Identity and API access ?

Service accounts ?

Service account
Compute Engine default service account

Access scopes ?

- ☒ Allow default access
- ☐ Allow full access to all Cloud APIs
- ☐ Set access for each API

Firewall ?

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

- ☐ Allow HTTP traffic
- ☐ Allow HTTPS traffic

✓ NETWORKING, DISKS, SECURITY, MANAGEMENT, SOLE-TENANCY

Your free trial credit will be used for this VM instance. [GCP Free Tier](#)

CREATE

CANCEL

EQUIVALENT COMMAND LINE

Disks

Additional disks

Security

Shielded VM and SSH keys

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](#)

SSH key *

ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQGC9K2rcq5j1tuDcvhKGRtIBJ

+ ADD ITEM

Management

Description, deletion protection, reservations, automation, and availability policies

Теперь мы хотим добавить SSH ключ для захода на машину.
Для этого заходим в **Networking, Disks, Security, ...**
Нажимаем **Add Item** в разделе Security и вписываем туда публичный SSH ключ

Жмём Create в самом низу. После этого появляется instance, который сразу же поднимается и с ним можно работать.

VM instances

CREATE INSTANCE

IMPORT VM

REFRESH

OPERATIONS

INSTANCES

INSTANCE SCHEDULE

VM instances are highly configurable virtual machines for running workloads on Google Infrastructure. [Learn more](#)

Filter

Enter property name or value

?

⋮

<input type="checkbox"/>	Status	Name ↑	Zone	Recommendations	In use by	Internal IP	Connect	
<input type="checkbox"/>	✓	instance-1	europa-west1-d			10.13 (nic0)	SSH	⋮

Related actions

DISMISS

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

Set up firewall rules

Control traffic to and from a VM instance

Patch management

Schedule patch updates and view patch compliance on VM instances

The screenshot shows the Google Cloud Platform console interface. At the top, there's a navigation bar with 'INSTANCES' and 'INSTANCE SCHEDULE'. Below this, a description states: 'VM instances are highly configurable virtual machines for running workloads on Google infrastructure. [Learn more](#)'. A filter bar is present with the text 'Filter Enter property name or value'. Below the filter, a table lists VM instances. The first instance, 'instance-1', is selected. A context menu is open over the 'instance-1' row, showing options: 'Start / Resume', 'Stop', 'Suspend', 'Reset', 'Delete', 'View network details', 'Create new machine image', 'View logs', and 'View monitoring'. The 'Stop' option is highlighted. To the right of the table, there's a sidebar for 'instance-1' with tabs for 'PERMISSIONS', 'LABELS', and 'MONITORING'. The 'PERMISSIONS' tab is active, showing a toggle for 'Show inherited permissions' and an 'ADD PRINCIPAL' button.

Status	Name	Zone	Recommendations	In use by	Internal IP	Connect
<input checked="" type="checkbox"/>	instance-1	europe-west1-d			10.130.0.10	SSH

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
- Set up firewall rules**
Control traffic to and from a VM instance
- Patch management**
Schedule patch updates and view patch compliance on VM instance

Чтобы остановить Instance выделяем и жмём Stop через 3 точки.

Это лучше делать каждый раз когда вы заканчиваете работу, чтобы **не забыть ОТКЛЮЧИТЬ В САМОМ КОНЦЕ** и с вас не списали деньги!!!

VM instances

CREATE INSTANCE

IMPORT VM

REFRESH

OPERATIONS

INSTANCES

INSTANCE SCHEDULE

instances are highly configurable virtual machines for running workloads on Google Cloud Platform. [Learn more](#)

Filter

Enter property name or value

Zone	Recommendations	In use by	Internal IP	External IP	Connect
eu-central1-west1-d			10.132.0.2 (nic0)	146.148.23.73	SSH

Related actions

DISMISS

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

Set up firewall rules

Control traffic to and from a VM instance

Patch management

Schedule patch updates and view patch compliance on VM instances

Тут видим External IP на который пробуем зайти по SSH.

(Для Ubuntu это команда **“ssh your_address”**)

Если публичный ключ был указан правильный, то вас должно пустить на машину


```
jokerlord@DESKTOP-CMFR7CA:~$ ssh 146.148.23.73
The authenticity of host '146.148.23.73 (146.148.23.73)' can't be established.
ECDSA key fingerprint is SHA256:3MSPXznb9vkcweblfVlCZlZnNgiz+0UAGMNDItchtXk.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '146.148.23.73' (ECDSA) to the list of known hosts.
=====
Welcome to the Google Deep Learning VM
=====

Version: pytorch-gpu.1-10.m86
Based on: Debian GNU/Linux 10 (buster) (GNU/Linux 4.19.0-18-cloud-amd64 x86_64\n)

Resources:
* Google Deep Learning Platform StackOverflow: https://stackoverflow.com/questions/tagged/google-dl-platform
* Google Cloud Documentation: https://cloud.google.com/deep-learning-vm
* Google Group: https://groups.google.com/forum/#!forum/google-dl-platform

To reinstall Nvidia driver (if needed) run:
sudo /opt/deeplearning/install-driver.sh
Linux instance-1 4.19.0-18-cloud-amd64 #1 SMP Debian 4.19.208-1 (2021-09-29) x86_64

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

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.

This VM requires Nvidia drivers to function correctly.  Installation takes ~1 minute.
Would you like to install the Nvidia driver? [y/n]
```

На оба вопроса отвечаем “yes” и “y” соответственно и ждём,
пока драйвер Nvidia установится.

```

Nvidia driver installed.
jokerlord@instance-1:~$
jokerlord@instance-1:~$ nvidia-smi
Fri Nov 26 11:36:53 2021
+-----+
| NVIDIA-SMI 460.73.01      Driver Version: 460.73.01      CUDA Version: 11.2      |
+-----+-----+-----+
| GPU   Name           Persistence-M| Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf    Pwr:Usage/Cap|      Memory-Usage | GPU-Util  Compute M. |
|=====+=====+=====+
|  0 Tesla T4             Off      | 00000000:00:04:0 Off |             0        |
| N/A   57C    P0      28W / 70W   |  0MiB / 15109MiB |         0%      Default |
|                                     |                    |                    N/A |
+-----+-----+-----+

+-----+
| Processes: |
| GPU   GI    CI          PID    Type    Process name                  GPU Memory |
|   ID   ID     ID              |                 |       Usage |
|=====+=====+=====+
| No running processes found |
+-----+
jokerlord@instance-1:~$ █

```

Получаем вот это.

Если написать **nvidia-smi** в консоли, то увидим нашу карту и её загруженность в данный момент.

Запускаем Jupyter Notebook через SSH

```
jokerlord@instance-1:~$ jupyter notebook --no-browser --port 1234
[I 11:40:48.811 NotebookApp] [nb_conda_kernels] enabled, 1 kernels found
jupyter_http_over_ws extension initialized. Listening on /http_over_websocket
[W 2021-11-26 11:40:50.588 LabApp] Config option 'kernel_spec_manager_class' not recognized by 'LabApp'.
[W 2021-11-26 11:40:50.590 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-11-26 11:40:50.590 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-11-26 11:40:50.590 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-11-26 11:40:50.591 LabApp] Config option 'kernel_spec_manager_class' not recognized by 'LabApp'.
[I 2021-11-26 11:40:50.599 LabApp] JupyterLab extension loaded from /opt/conda/lib/python3.7/site-packages/jupyterlab
[I 2021-11-26 11:40:50.599 LabApp] JupyterLab application directory is /opt/conda/share/jupyter/lab
[I 11:40:50.683 NotebookApp] [JupyterText Server Extension] Deriving a JupyterTextContentsManager from LargeFileManager
[I 11:40:50.687 NotebookApp] [nb_conda] enabled
/opt/conda/lib/python3.7/site-packages/jupyter_server_mathjax/app.py:40: FutureWarning: The alias `_()` will be deprecated. Use `_i18n()` instead.
  help= (""The MathJax.js configuration file that is to be used."""),
[I 11:40:50.736 NotebookApp] Serving notebooks from local directory: /home/jokerlord
[I 11:40:50.736 NotebookApp] Jupyter Notebook 6.4.6 is running at:
[I 11:40:50.736 NotebookApp] http://localhost:1234/?token=0bb1acb7b5b0438d40bb3147830d1a64d729d32f68d8b65b
[I 11:40:50.736 NotebookApp] or http://127.0.0.1:1234/?token=0bb1acb7b5b0438d40bb3147830d1a64d729d32f68d8b65b
[I 11:40:50.736 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 11:40:50.740 NotebookApp]

To access the notebook, open this file in a browser:
file:///home/jokerlord/.local/share/jupyter/runtime/nbserver-1809-open.html
or copy and paste one of these URLs:
http://localhost:1234/?token=0bb1acb7b5b0438d40bb3147830d1a64d729d32f68d8b65b
or http://127.0.0.1:1234/?token=0bb1acb7b5b0438d40bb3147830d1a64d729d32f68d8b65b
[I 11:43:15.422 NotebookApp] 302 GET / (:::1) 1.000000ms
[I 11:43:15.478 NotebookApp] 302 GET /tree? (:::1) 1.100000ms
[I 11:43:56.349 NotebookApp] 302 GET /?token=0bb1acb7b5b0438d40bb3147830d1a64d729d32f68d8b65b (:::1) 0.610000ms
```

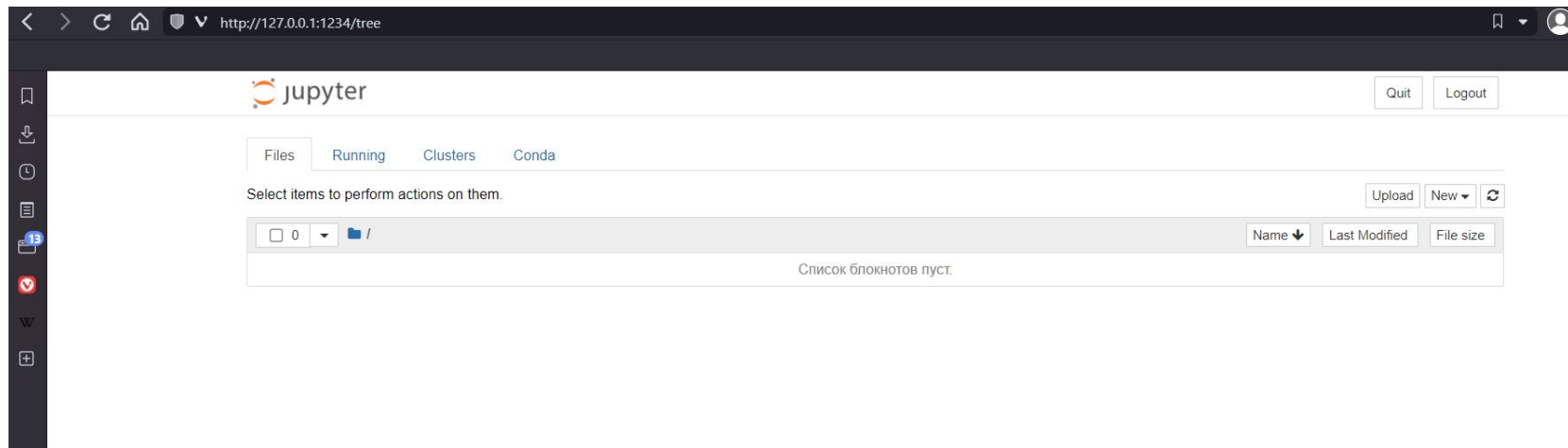
Запускаем юпитер ноутбук на машине с помощью команды
jupyter notebook --no-browser --port 1234
и запоминаем выделенную ссылку

```
jokerlord@DESKTOP-CMFR7CA:~$ ssh -NL 1234:localhost:1234 146.148.23.73
```

Открываем второе окно консоли и пишем туда вот такую команду.
Где в конце должен стоять **External address** вашей VM.

Если никаких сообщений не вылезло, то всё правильно.

Также иногда после долго простоя VM можно прервать ваше соединение по ssh, чтобы всё починить, нужно просто ещё раз написать эту команду.



После, заходим в браузере по ссылке, которая выделена 2 слайда назад и получаем вот такой результат.

Тут уже можно работать как в обычном юпитер ноутбуке.

The screenshot shows a Jupyter Notebook interface with the following elements:

- Header:** "jupyter Untitled" followed by "Последняя контрольная точка: 2 минуты назад (несохраненные изменения)". On the right, there is a Python logo, a "Logout" button, and a "Доверенный" (Trusted) status indicator.
- Menu Bar:** File, Edit, View, Insert, Cell, Kernel, Widgets, Help.
- Toolbar:** Contains icons for file operations, a "Запуск" (Run) button, a "Код" (Code) dropdown menu, and an "nbdiff" button.
- Code Cells:**
 - Ввод [2]: `import torch`
 - Ввод [3]: `torch.cuda.is_available()`
Out[3]: `True`
 - Ввод [4]: `torch.cuda.current_device()`
Out[4]: `0`
 - Ввод [5]: `torch.cuda.get_device_name(0)`
Out[5]: `'Tesla T4'`
 - Ввод []: (An empty code cell with a green border, indicating it is the active cell.)

Создаём ноутбук и нужные библиотеки тут уже установлены.

Можно делать домашку :)

Как загрузить или скачать файлы через ssh

В процессе вашей работы вам может потребоваться загрузить файл на машину или скачать с неё какие-то результаты.

Сделать это на линуксе можно через утилиту **scp**.

Подробнее про работу с ней можно почитать тут:

<https://wiki.enchtex.info/tools/console/scp>