

Managing Enterprise Cybersecurity

MIS 4596

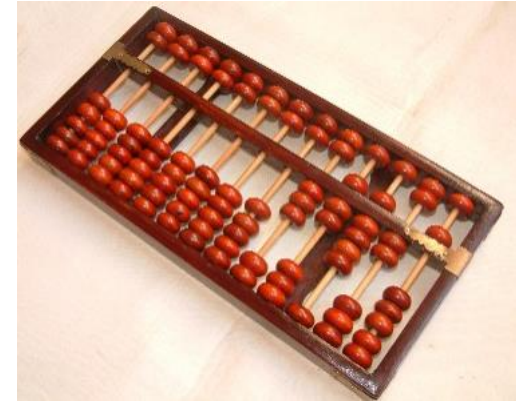
Class 4

Agenda

- Short history of computers, Unix and Linux
- Introduction to the Google Cloud Platform
- Next step... Linux tutorial

Information Systems Development – a brief history

- **Prior 1946** - Before “stored-program” digital computers
 - Devices were pure hardware and had no software - their computing powers were directly tied to their specific form and engineering
- Computing as a concept goes back to ancient times
 - Beginning with devices such as the **abacus**
 - Calculating tool used in China, Europe, and Russia centuries before adoption of written Hindu-Arabic numeral system we use today
 - Continuing on through early examples of computing such as the **Antikythera** mechanism
 - Ancient Greek analog computer used as a calendar to predict eclipses and astronomical positions decades in advance



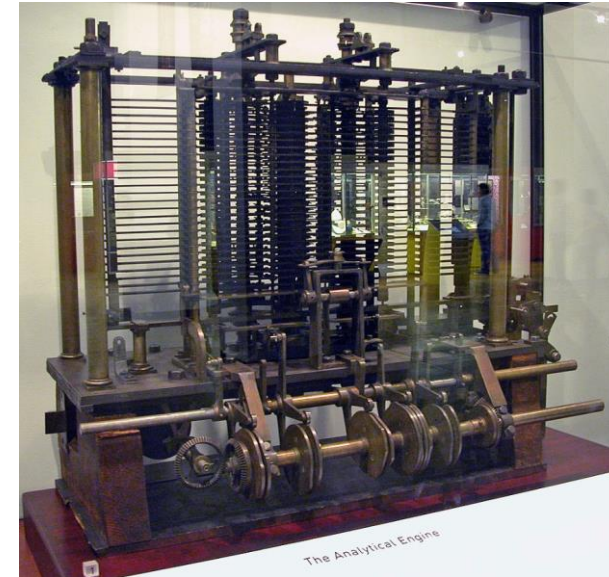
Wikipedia – History of Software

Information Systems Development – a brief history

- **Prior 1946** - Before “stored-program” digital computers

- **1837 – The Analytical Engine**

- First design for a general-purpose computer
- Designed by English mathematician Charles Babbage
- Incorporated:
 - Integrated memory
 - Arithmetic logic unit
 - Control flow in the form of conditional branching and loops
- Logical structure essentially the same as the computer design that dominates in today’s electronic era
- First known computer program was written by Ada Lovelace to implement Luigi Menabrea’s equations for generating a Bernoulli number sequence of rational numbers
 - The Analytical Engine predated the techniques of electrical engineering needed to run it

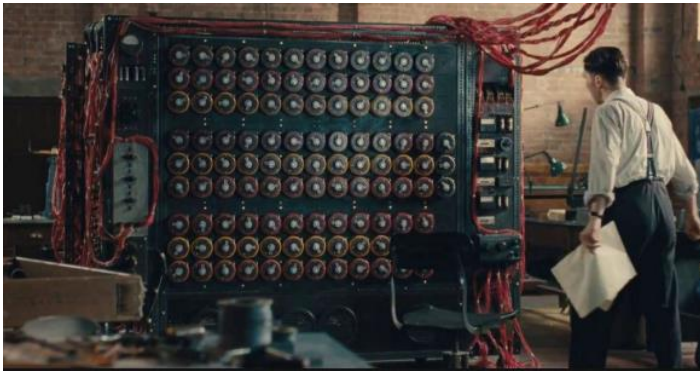


Wikipedia – History of Software

Information Systems Development – a brief history

Prior 1946 - Before “stored-program” digital computers

- **1935** – Alan Turing proposed the first modern theory of **software**
 - Software requires
 - A **general-purpose processor** - described as a Turing machine
 - **Computer memory**
 - In which reusable sets of routines and mathematical functions comprising programs can be stored, started, and stopped individually
- This concept is recent in human history, led to the creation of the twin academic fields of **computer science** and **software engineering**



Information Systems Development – a brief history

- **1948 – 1979** Early days of computer software

- 1948 - Claud Shannon “Father of Information Theory” wrote *A Mathematical theory of Communication* and provided an outline for how **binary logic** could be **implemented to program a computer**
 - Subsequently, the first computer programmers used binary code to instruct computers to perform various tasks
- 1948 – ***Birth of Software*** Tim Kilburn at the University of Manchester UK wrote the first program code stored in an electronic memory to calculate the highest factor of an integer
- 1950’s – 1960’s ***Development of high-level computer languages*** Fortran, LISP, COBOL and BASIC allowed programs to be specified in an abstract way, independent of the precise details of the hardware architecture of the computer



Grace Hopper developed the “self-documenting” COBOL (COmmon Business Oriented Language)



Margaret Hamilton led development of the onboard flight software for NASA’s Apollo spacecraft coined the term “software engineering”

Wikipedia – History of Software

Information Systems Development – a brief history

- **1948 – 1979** Early days of computer software and operating systems

- 1960's – Massachusetts Institute of Technology, AT&T Bell Labs, and General Electric jointly developed an experimental **time sharing operating system** called Multics

- Allowing multiple users to access a **mainframe computer** simultaneously

- 1970's – Bell Lab's researchers left the team and implemented a **self-hosting operating system that became UNIX** on a **minicomputer**

- Included concepts of computer processes, device files, hierarchical file system, command-line interpreter, editor, programming shell, and assembler

- Text editor and first text formatting and publishing program written in assembly language

- 1971 – *UNIX Programmer's Manual* written

- 1973 – Unix Version 3 rewritten in higher-level C language

- Most popular variants of Unix today are

- macOS Mac OS X

- Linux

Wikipedia – History of Software



Information Systems Development – a brief history

Linux, computer operating system created in the early 1990s by Finnish software engineer Linus Torvalds and the Free Software Foundation (FSF)

- While still a student at the University of Helsinki, Torvalds started developing **Linux** to create a system similar to **MINIX** (“mini-Unix”)
 - MINIX was first released in 1987 with its complete source code
 - A free open-source UNIX-like operating system developed as a learning tool to run on early personal computers
 - Made available to universities for study in courses and research



Computer Operating Systems

An **operating system (OS)** manages computer hardware, software resources, and provides common services for computer programs

Operating systems are found on many devices that contain a computer – cellular phones, video game consoles, web servers and supercomputers

- Operating system acts as an **intermediary between programs and the computer hardware**
- **Desktop operating systems:**
 - Microsoft Windows with a market share of around 73.72%
 - macOS (OS X) by Apple Inc. is in second place (15.33%)
 - Varieties of Linux are collectively in third place (2.09%)
- **Mobile operating Systems** (including smartphones and tablets):
 - Google Android's share was 70.01%
 - Apple's iOS with 29.24%
 - Samsung 0.43%

<https://gs.statcounter.com/os-market-share/mobile/worldwide>

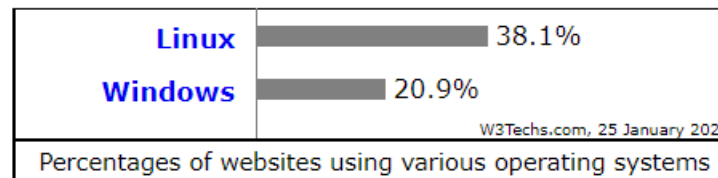
• Internet Server operating systems

- Unix and Linux 38.1%
- Microsoft Windows 20.9%

• Super-Computer operating systems

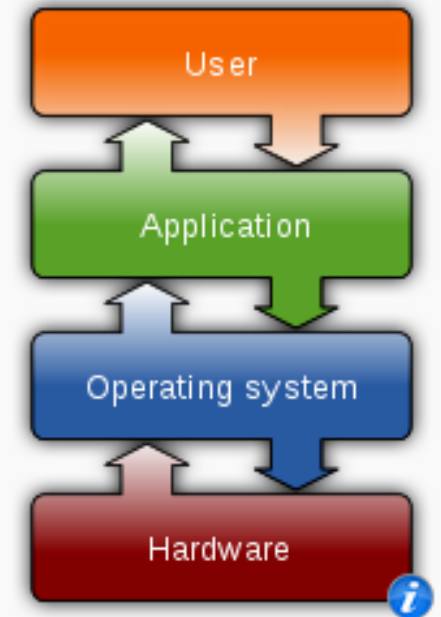
- Linux is the operating system

<https://w3techs.com/technologies/comparison/os-linux,os-windows>



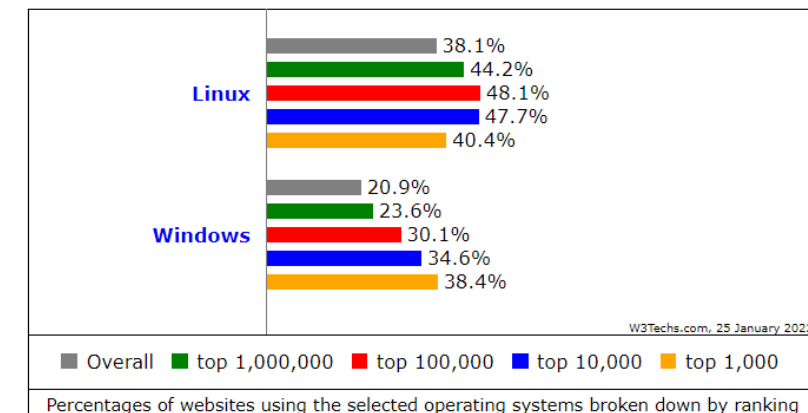
MIS 4596

Operating systems



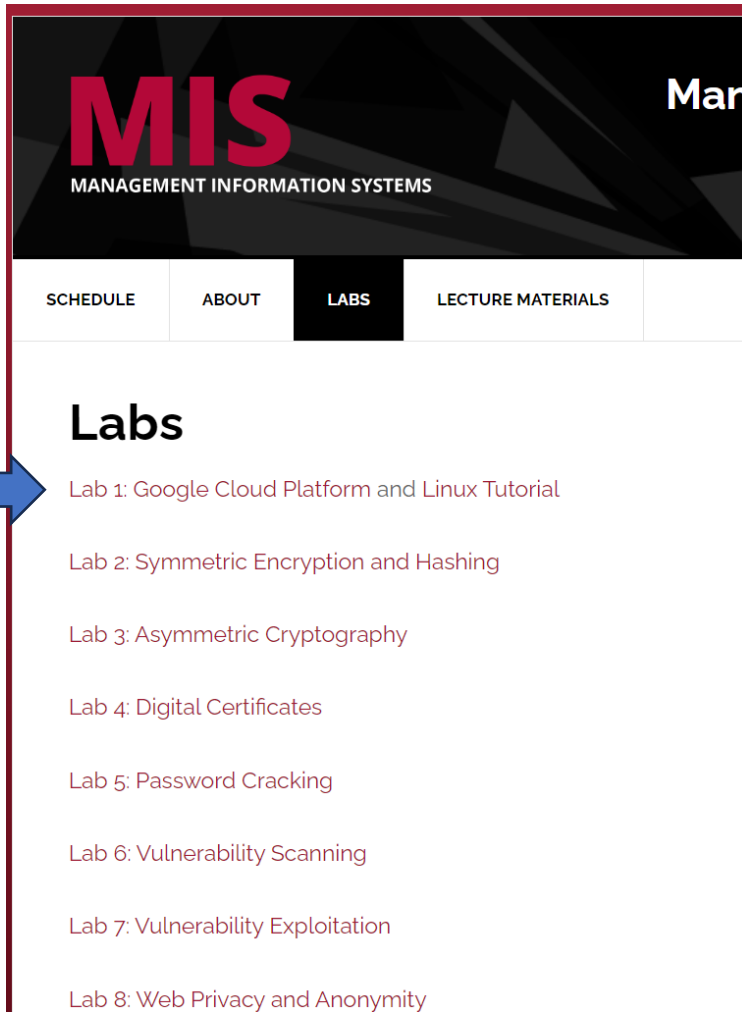
Common features

Process management · Interrupts ·
Memory management · File system ·
Device drivers · Networking · Security · I/O



Lab 1: Google Cloud Platform

For help with labs contact ITA:
camryn.zavacky@temple.edu
Office hours 10-11 MF and by appointment



MIS
MANAGEMENT INFORMATION SYSTEMS

SCHEDULE ABOUT **LABS** LECTURE MATERIALS

Labs

- Lab 1: Google Cloud Platform and Linux Tutorial
- Lab 2: Symmetric Encryption and Hashing
- Lab 3: Asymmetric Cryptography
- Lab 4: Digital Certificates
- Lab 5: Password Cracking
- Lab 6: Vulnerability Scanning
- Lab 7: Vulnerability Exploitation
- Lab 8: Web Privacy and Anonymity

← → ↻ security-assignments.com/tutorials/intro-to-gcp.html

Security-Assignments.com Labs Tutorials Projects In-class Activities Books and Films Store

Introduction to Google Cloud Platform

By Drs. Dave Eargle and Anthony Vance

Part 0: Choose a Google account

In this tutorial, you will use a Google account to sign up for Google Cloud Platform (GCP). You will also join a Google Group with this account, which will give you access to certain GCP resources.

Choose an [@gmail.com](#) Google account you will use. **Important:** It must be an [@gmail.com](#) Google account.

You have several options:

- You can use a personal Google account that you already have
- You can create a new personal Google account by signing up for one [here](#)
- If you have a non-[@gmail.com](#) google account (perhaps through your university), it won't work for GCP unless the domain admin has enabled creation of GCP resources by your account. **For example, @temple.edu GCP accounts will not be able to create projects on GCP.** If this is the case, use a personal Google account.

Regardless, whenever you use GCP, be sure that you are accessing the platform while signed in to the correct Google account. Otherwise, you may be confused to not see expected projects or to get "access denied" messages.

Tip: You can use a browser incognito window to make sure you are signed in to the correct google account. In this window, sign in only to the google account you want to use with GCP.

Part 1: Sign up for Google Cloud Platform (GCP)

Important: Do the following while signed in to the Google account that you want to use with GCP.

- Visit <https://cloud.google.com> and click "Get started for free."
- Make sure you are signed in to Google with the account you want to use with GCP
- Step 1 of 2: Agree to the terms of service.
- Step 2 of 2: Choose "Account type" > "Individual". Complete the sign-up form. Provide a credit card.

Part 0: Choose a Google account

- Part 1: Sign up for Google Cloud Platform (GCP)
- Part 2: Purchase the lab virtual machine access package
- Part 3: Create a new project and launch a new Kali Linux instance
- Part 4: Connect to your Kali Linux VM using Chrome Remote Desktop
- Part 5: Set up budget alerts
- Part 6: Install a GCP Console app on a mobile device
- Part 7: Complete the Introduction to Linux Tutorial Deliverable

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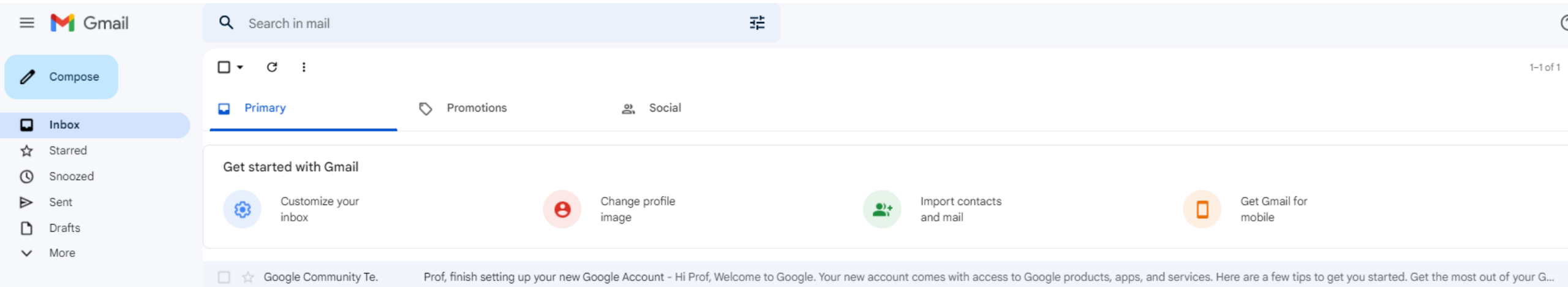
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Part 7: Complete the Introduction to Linux Tutorial

Deliverable

Create a gmail account for MIS 4596



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Why a credit card? Google still requires a credit card to make sure you are not a robot. Google will not autocharge your account unless you manually upgrade to a paid plan.

- Click "Start my free trial".

Contact Us

Get \$300 in free credits and free usage of 20+ products →

The new way to cloud starts here

Build apps fast, leverage generative AI, and analyze data in seconds—all with Google-grade security.

Contact sales

Go to console



Solve real business challenges on Google Cloud

Contact sales

Go to console

Run workloads for free

20+ free products for all customers

All customers get free hands-on experience with popular products, including Compute Engine and Cloud Storage, [up to monthly limits](#).

\$300 in free credits for new customers

New customers get [\\$300 in free credits](#) to fully explore and conduct an assessment of Google Cloud. You won't be charged until you upgrade.

Start deploying pre-built solutions free

New customers get [\\$300 in free credits](#) on signup to use on deploying a dynamic website, launching a VM, building a three tier web app, and more [pre-built solutions templates](#).

Contact Us

Filter

Google Cloud Free Program

Program Overview

Google Cloud Free Program

Evaluate Google Cloud

What makes Google Cloud different?

Estimate and compare costs

Measure and compare performance

Get started with Compute Engine

90-day, \$300 Free Trial offer

The Free Trial provides you with free Cloud Billing credits to pay for resources used while you learn about Google Cloud.

| | |
|----------------------------|---|
| Program eligibility | <p>You're eligible for the Free Trial if you meet the following conditions:</p> <ul style="list-style-type: none">You've never been a paying customer of Google Cloud, Google Maps Platform, or Firebase.You haven't previously signed up for the Free Trial.If you're in India, you must have an INR-based Cloud billing account before creating Firebase billing accounts to sign up for the Free Trial. Google Maps Platform services are not available on projects linked to INR-based accounts. |
| Program initiation | <p>The 90-day, \$300 Free Trial period starts automatically when you complete your signup.</p> <p>To complete your Free Trial signup, you must provide a credit card or other payment method to set up a Cloud Billing account and verify your identity. Don't worry, setting up a Cloud Billing account does not enable us to charge you. You are not charged unless you explicitly enable billing by upgrading your Cloud Billing account to a paid account. You can upgrade to a paid account at any time during the trial. After you have upgraded, you can still use any remaining credits (within the 90-day period).</p> |
| Program coverage | <p>Your Free Trial credits apply to all Google Cloud resources, including Google Maps Platform usage, but with the following exceptions:</p> <ul style="list-style-type: none">You can't add GPUs to your VM instances. |

On this page

[90-day, \\$300 Free Trial offer](#)

[Billing verification](#)

[Monitor your charges during the Free Trial](#)

[When the Free Trial offer ends](#)

[Cancel the Free Trial offer](#)

[Upgrade to a paid Cloud Billing account](#)

[Costs after the Free Trial](#)

[Minimize or stop charges to your paid Cloud Billing account](#)

Free Tier

[Free Tier usage limits](#)

[Exceeding Free Tier usage limits](#)

[Google Cloud Marketplace products and](#)



Step 1 of 2 Account Information



Prof Dave
profdavel461@gmail.com

[SWITCH ACCOUNT](#)

Country

United States ▼

What best describes your organization or needs?

Please select
Class project / assignment ▼

Terms of Service

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

Required to continue

[CONTINUE](#)

Access to all Cloud Platform Products

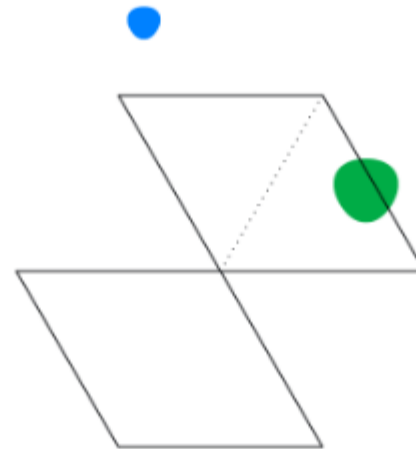
Get everything you need to build and run your apps, websites and services, including Firebase and the Google Maps API.

\$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 2 Payment Information Verification

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

 Account type 

Individual

Only Business accounts can have multiple users. You cannot change the account type after signing up. In some countries, this selection affects your tax options.

[Learn more](#)

Payment method

 Add credit or debit card 

Card number

#

Card number is required

MM / YY

CVC

Cardholder name

Cardholder name is required



Billing address

[START MY FREE TRIAL](#)

Access to all Cloud Platform Products

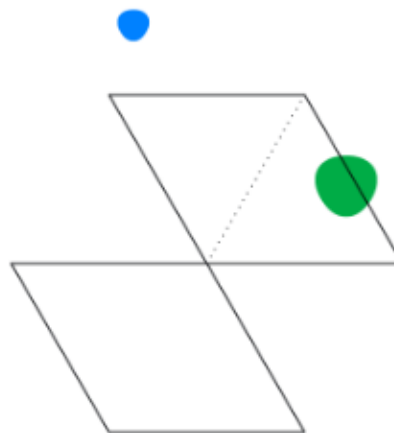
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Welcome Prof Dave!

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?

2 What brought you to Google Cloud?

Please select *

Learn more / explore

Learn about specific products, services, and/or APIs

Use specific products, services, and/or APIs

Compare Google Cloud to other cloud providers

Evaluate technical capabilities of Google Cloud

4 What brought you to Google Cloud?

Build / test a proof of concept

Other

Welcome Prof Dave!

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 *

Academic / Educator

CLOSE

DONE


Get started with an interactive tutorial

Try Compute Engine

 4 minutes

Learn how to create a highly configurable Linux VM instance for running workloads on Compute Engine.

- ✓ Custom machine types to optimize vCPU and memory while balancing cost
- ✓ Preemptible machines to reduce computing costs
- ✓ Rightsizing recommendations to optimize resource utilization

Monthly estimate: \$25.46 credits 


[START TUTORIAL](#)

Try Cloud Storage

 5 minutes


Learn how to work with object storage for all-sized needs. Store any amount of data. Retrieve as often as you'd like.

- ✓ Store files and objects remotely and retrieve from anywhere
- ✓ Worldwide access and storage locations
- ✓ High availability and durability

Monthly estimate: \$5.10 credits 

[START TUTORIAL](#)

Try Cloud SQL

 10 minutes

Learn how to get started with a fully managed relational database service for MySQL, PostgreSQL, and SQL Server.

- ✓ Fully managed database set up in minutes
- ✓ Easily migrate from existing databases
- ✓ Integrate with any application with full database compatibility

[START TUTORIAL](#)

[SKIP FOR NOW](#)

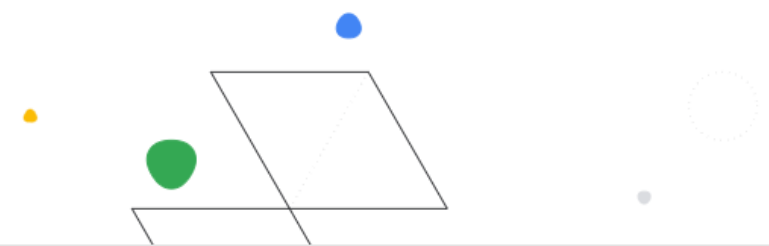


- Cloud overview
- Recent
- View all products
- PINNED
- APIs & Services
- Billing
- IAM & Admin
- Marketplace
- Compute Engine
- Kubernetes Engine
- Cloud Storage
- BigQuery
- VPC network
- Cloud Run
- SQL
- Security
- Google Maps Platfor...

MORE PRODUCTS

Welcome, Prof Dave

Get started with Google Cloud



Begin with the basics

Get up and running quickly by checking off common tasks

GO TO CHECKLIST

Setting up Google Cloud for scalable, production-ready enterprise workloads? Use the [Google Cloud setup checklist](#) designed for administrators.

What's covered

- Reviewing billing, credits, and projects
- Finding products and APIs
- Adding resources to a project
- Understanding and calculating pricing

Top products

VIEW ALL

Compute products



Compute Engine

Made by Google

Scalable, high-performance virtual machines

GO TO COMPUTE ENGINE

Other popular compute options

[Kubernetes Engine](#)

One-click Kubernetes clusters, managed by Google

[Cloud Run](#)

Fully managed compute platform for deploying and scaling containerized applications quickly and securely

[Functions](#)

Event-driven serverless functions

COMPARE

VIEW ALL

Storage and database products

Part 2: Purchase the lab virtual machine access package

To get access to the Google Cloud Platform virtual machines created for the labs on this site, [visit the storefront](#) and follow instructions there to purchase access to the "lab virtual machine access package". This will give your gcp email address access to certain Kali GCP images used for this class.

Part 3: Create a new project and launch a new Kali Linux instance

Once you have purchased access and your gcp email address has been added to the infosec-management google group,

Part 0: Choose a Google account

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Deliverable

Store

This page is the storefront for security-assignments.com.

Lab virtual machine access package -- \$50 for Academic year 22/23

To gain access to the lab virtual machines, do the following:

1. Sign up for an account on GCP using an @gmail.com address.*
2. Enter your GCP **@gmail.com** address on this page, and click "Continue."
3. Submit payment for the **lab virtual machine access package**.
4. Within a few minutes, you should receive notification to your gcp email address (not your paypal email address) that the gcp email address has been added to the **image-user@security-assignments.com** group, giving it access to the lab virtual machines.

If you later want to change your GCP email associated with your purchase, support@security-assignments.com
Non-transferrable to different persons -- just transferrable within google accounts that belong to you.

* If you have a non-@gmail.com email address that you are certain will work on GCP, contact access-request@security-assignments.com.

If you need support, contact support@security-assignments.com

GCP Email address

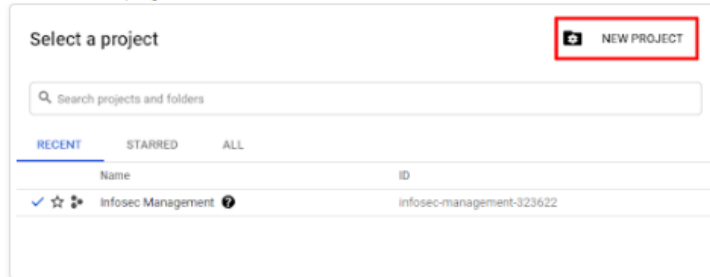
The @gmail.com email address that you will use with GCP.

Continue

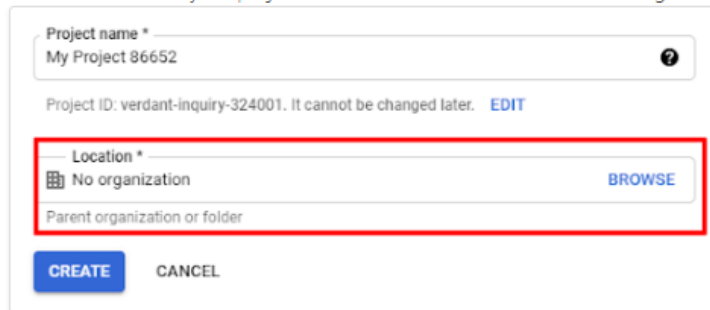
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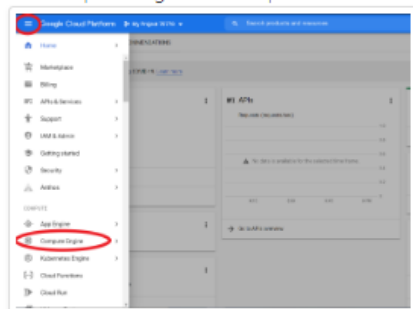
- Return to <https://console.cloud.google.com>
- Then, create a new "project" which will house all of the material for this class.
 1. Click "create project"



2. Choose a name for your project, and for the "Location," choose "No Organization".



- Then, expand the hamburger menu and navigate to the "Compute Engine" area. Click to enable. Wait a few minutes for Compute Engine to set up.



- Click "Enable."



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Deliverable

Free trial status: \$300.00 credit and 91 days remaining - with a full account, you'll get unlimited access to all of Google Cloud Platform. DISMISS ACTIVATE

Google Cloud **My First Project** ▾

- Cloud overview >
- Recent >
- View all products

PINNED

- RPI APIs & Services >
- Billing
- IAM & Admin >
- Marketplace
- Compute Engine >
- Kubernetes Engine >
- Cloud Storage >
- BigQuery >
- VPC network >
- Cloud Pub

DASHBOARD **ACTIV**

Project info

Project name
My First Project

Project number
832474904175

Project ID
stalwart-method-363801


[ADD PEOPLE TO THIS PROJECT](#)

[Go to project settings](#)

Resources

- BigQuery
Data warehouse/analyt...
- SQL
Managed MySQL, Pos...
- Compute Engine
VMs, GPUs, TPUs, Dis...
- Storage
Multi-class multi-regi...

Select a project

 **NEW PROJECT**

RECENT STARRED ALL

| Name | ID |
|--|------------------------|
| ✓ ☆ My First Project ? | stalwart-method-363801 |

CANCEL **OPEN**

1 ? P

[CUSTOMIZE](#)

Platform status ⋮

Dashboard

⋮

Have you set up Error Reporting?

Project info

Project name
My First Project

Project number
832474904175

Project ID
stalwart-method-363801

[ADD PEOPLE TO THIS PROJECT](#)

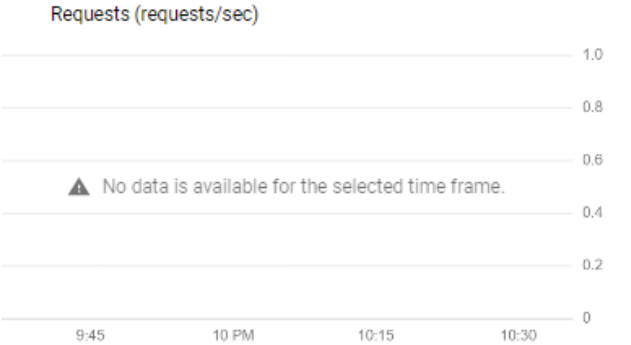
[Go to project settings](#)

Resources

- BigQuery**
Data warehouse/analytics
- SQL**
Managed MySQL, PostgreSQL, SQL Server
- Compute Engine**
VMs, GPUs, TPUs, Disks
- Storage**

API APIs

Requests (requests/sec)



[Go to APIs overview](#)

Google Cloud

Data analytics

[Go to Cloud](#)

Monitoring

- Create my dashboard
- Set up alerting policies
- Create uptime checks
- View all dashboards

[Go to Monitoring](#)

Notifications

- ✓ Create Project: MIS4596-Project 1 minute ago
[SELECT PROJECT](#)
- ✓ Create Project: My First Project 40 minutes ago
[SELECT PROJECT](#)

[SEE ALL ACTIVITIES](#)

Now viewing project "My First Project" in organization "No organization" ✕

API Error Reporting

- ☰ Cloud overview >
- 🕒 Recent >
- 🗑️ View all products

- PINNED
- API APIs & Services >
 - 📄 Billing
 - 🛡️ IAM & Admin >
 - 🛒 Marketplace
 - ⚙️ Compute Engine >
 - 🏠 Kubernetes Engine >
 - 📄 Cloud Storage >
 - 🔍 BigQuery >
 - 🔗 VPC network >

RECOMMENDATIONS

API APIs & Services

Project ID: mis4596-project-363802

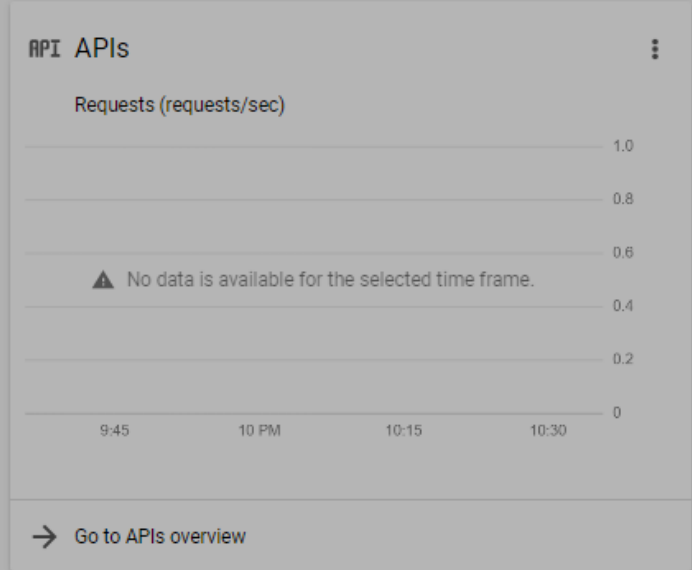
👤 THIS PROJECT

Settings

Cloud Storage

Cloud SQL, PostgreSQL, SQL Server

Cloud IAM, Disks



Google Cloud Platform status

Data unavailable

→ Go to Cloud status dashboard

Monitoring

- Create my dashboard
- Set up alerting policies
- Create uptime checks

View all dashboards

→ Go to Monitoring

Now viewing project "MIS4596-Project" in organization "No organization" ✕



Free trial status: \$300.00 credit and 91 days remaining - with a full account, you'll get unlimited access to all of Google Cloud Platform.



Google Cloud



MIS4596-Project



Compute Engine API

[Google Enterprise API](#)

Compute Engine API

ENABLE

TRY THIS API [↗](#)

Click to enable this API

OVERVIEW

DOCUMENTATION

SUPPORT

Overview

Creates and runs virtual machines on Google Cloud Platform.

Additional details

Type: [SaaS & APIs](#)

Last updated: 7/21/22

Category: [Compute](#), [Networking](#), [Google Enterprise APIs](#)

Service name: compute.googleapis.com

Tutorials and documentation



Free trial status: \$300.00 credit and 91 days remaining - with a full account, you'll get unlimited access to all of Google Cloud Platform.

Compute Engine

VM instances

- CREATE INSTANCE
- IMPORT VM
- REFRESH
- START / RESUME
- STOP
- SUSPEND
- RESET
- DELETE
- CREATE SCHEDULE

INSTANCES INSTANCE SCHEDULES

Filter Enter property name or value

| <input type="checkbox"/> | Status | Name ↑ | Zone | Recommendations | In use by | Internal IP | External 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

- Virtual machines
 - VM instances
 - Instance templates
 - Sole-tenant nodes
 - Machine images
 - TPUs
 - Committed use discounts
 - Migrate to Virtual Machin...
- Storage
 - Disks
 - Snapshots
 - Images
- Instance groups
 - Instance groups
 - Health checks
- VM Manager

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 *
kali

Labels ?

+ ADD LABELS

Region *
us-central1 (Iowa)

Region is permanent

Zone *
us-central1-a

Zone is permanent

Machine configuration

Machine family

GENERAL-PURPOSE COMPUTE-OPTIMIZED MEMORY-OPTIMIZED GPU

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-standard-4 (4 vCPU, 15 GB memory)



vCPU

4

Memory

15 GB

CPU platform
Intel Haswell or later

vCPUs to core ratio

Visible core count

Monthly estimate

\$98.09

That's about \$0.13 hourly

Pay for what you use: No upfront costs and per second billing

| Item | Monthly estimate |
|--------------------------------|------------------|
| 4 vCPU + 15 GB memory | \$138.70 |
| 10 GB balanced persistent disk | \$1.00 |
| Sustained use discount | -\$41.61 |
| Total | \$98.09 |

[Compute Engine pricing](#)

^ LESS



Free trial status: \$300.00 credit and 91 days remaining - with a full account, you'll get unlimited access to all of Google Cloud Platform.

Google Cloud MIS4596-Project

Search Products, resources, docs (/)

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

[Learn More](#)

+ ADD GPU

^ CPU PLATFORM AND GPU

Display device

Enable to use screen capturing and recording tools.

Enable display device

Confidential VM service

Confidential Computing is disabled on this VM instance

ENABLE

Container

Deploy a container image to this VM instance

DEPLOY CONTAINER

Boot disk

| | |
|--------------|--------------------------------|
| Name | kali |
| Type | New balanced persistent disk |
| Size | 10 GB |
| License type | Free |
| Image | Debian GNU/Linux 11 (bullseye) |

CHANGE

Monthly estimate
\$98.09
That's about \$0.11 per hour
Pay for what you use

| Item |
|--------------------------------|
| 4 vCPU + 15 GB memory |
| 10 GB balanced persistent disk |
| Sustained use discounts |
| Total |

[Compute Engine pricing](#)

^ LESS

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 ARCHIVE SNAPSHOTS EXISTING DISKS

Source project for images * security-assignments-kali **?** CHANGE

Show deprecated images

Image * kali-v3-0-3 **v**
Created on Jul 27, 2022, 6:45:55 PM

Boot disk type * Standard persistent disk **v**

COMPARE DISK TYPES

Size (GB) * 500

^ SHOW ADVANCED CONFIGURATION

SELECT CANCEL

Select a project



NEW PROJECT

🔍 Search projects and folders

RECENT

STARRED

ALL

| Name | ID |
|---|---------------------------|
| ▼ 🗂 No organization | 0 |
| ☆ 🗨 MIS4596-Project | mis4596-project-363802 |
| ☆ 🗨 My First Project | stalwart-method-363801 |
| ☆ 🗨 security-assignments-kali | security-assignments-kali |

CANCEL

OPEN

Compute Engine

VM instances

- CREATE INSTANCE
- IMPORT VM
- REFRESH
- START / RESUME
- STOP
- SUSPEND
- RESET
- DELETE
- CREATE SCHEDULE
- OPERATIONS

Virtual machines

- VM instances
- Instance templates
- Sole-tenant nodes
- Machine images
- TPUs
- Committed use discounts
- Migrate to Virtual Machin...

Storage

- Disks
- Snapshots
- Images

Instance groups

- Instance groups
- Health checks

VM Manager

- OS patch management
- OS configuration manage...

Bare Metal Solution

- Marketplace
- Release Notes

INSTANCES INSTANCE SCHEDULES

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

Filter Enter property name or value

| Status | Name | Zone | Recommendations | In use by | Internal IP | External IP | Connect |
|-------------------------------------|------|---------------|-----------------|-----------|-------------------|---------------------|---------|
| <input checked="" type="checkbox"/> | kali | us-central1-a | | | 10.128.0.2 (nic0) | 35.222.1.201 (nic0) | SSH |

https://ssh.cloud.google.com/v2/ssh/projects/mis4596-project-363802/zones/us-central1-a/instances/kali?authuser=0&hl=en_US&projec...

ssh.cloud.google.com/v2/ssh/projects/mis4596-project-363802/zones/us-central1-a/instances/kali?authuser=0&hl=en_US&projectNum...

SSH-in-browser

```
Linux kali 5.10.0-kali7-amd64 #1 SMP Debian 5.10.28-1kali1 (2021-04-12) x86_64

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

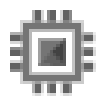
Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
(Message from Kali developers)

We have kept /usr/bin/python pointing to Python 2 for backwards
compatibility. Learn how to change this and avoid this message:
=> https://www.kali.org/docs/general-use/python3-transition/

(Run: "touch ~/.hushlogin" to hide this message)
(profdavel461@kali) ~$
```

VM logs
Analyze, and download VM

HIDE



SSH-in-browser

```
Linux kali 5.10.0-kali7-amd64 #1 SMP Debian 5.10.28-1kali1 (2021-04-12) x86_64
```

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

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

```
(Message from Kali developers)
```

```
We have kept /usr/bin/python pointing to Python 2 for backwards  
compatibility. Learn how to change this and avoid this message:  
⇒ https://www.kali.org/docs/general-use/python3-transition/
```

```
(Run: "touch ~/.hushlogin" to hide this message)
```

```
(profdavel461@kali) - [~]
```

```
$ whoami
```

```
profdavel461
```

```
(profdavel461@kali) - [~]
```


```
$ pwd
```

```
/home/profdavel461
```

```
(profdavel461@kali) - [~]
```

```
$ █
```

- Remote Access
- Remote Support
- Set up via SSH**






Set up another computer

If you have remote access to a computer, for example via Secure Shell (SSH), you can use this page to set it up for graphical remote access using Chrome Remote Desktop.

[Begin](#)

[Help](#)

- Send feedback
- Toggle theme

 Remote Access Remote Support Set up via SSH

Set up another computer

You're nearly finished! Run the following command on the remote computer to complete the setup process. Please note that this command can only be used to set up one computer; click Start over if you have more computers to set up.

Windows (Cmd)

```
"%PROGRAMFILES(X86)%\Google\Chrome Remote Desktop\CurrentVersion\remoting_start_host.exe" --code="4/0ARTbsJrUSRxEhX1gqVPgYGwZC6Vrgff0HQ0de8Nir5q8iA6s0kEi"
```

Windows (PowerShell)

```
& "${Env:PROGRAMFILES(X86)}\Google\Chrome Remote Desktop\CurrentVersion\remoting_start_host.exe" --code="4/0ARTbsJrUSRxEhX1gqVPgYGwZC6Vrgff0HQ0de8Nir5q8iA6s0kEi"
```

Debian Linux

```
DISPLAY= /opt/google/chrome-remote-desktop/start-host --code="4/0ARTbsJrUSRxEhX1gqVPgYGwZC6Vrgff0HQ0de8Nir5q8iA6s0kEiz0YcFfHaSYONEqhJ1A" --redirect-
```

Copy to clipboard.

Start over

https://ssh.cloud.google.com/v2/ssh/projects/mis4596-project-363802/zones/us-central1-a/instances/kali?authuser=0&hl=en_US&projec...

ssh.cloud.google.com/v2/ssh/projects/mis4596-project-363802/zones/us-central1-a/instances/kali?authuser=0&hl=en_US&projectNum...



SSH-in-browser



```
Linux kali 5.10.0-kali7-amd64 #1 SMP Debian 5.10.28-1kali1 (2021-04-12) x86_64
```

```
The programs in  
the exact distr  
individual file
```

```
Kali GNU/Linux  
permitted by ap
```

```
(Message from
```

```
We have kept  
compatibility  
=> https://www
```

```
(Run: "touch
```

```
(profdavel46
```

```
$ whoami  
profdavel461
```

```
(profdavel46
```

```
$ pwd  
/home/profdavel
```

```
(profdavel46
```

```
$ DISPLAY= /oj  
q8iA6s0kEizOYcFfHaSYONEqhJIA" --redirect-url="https://remotedesktop.google.com/ /oauthredirect" --name=$(hostna  
me)
```

| | |
|------------------------------------|--------------|
| Emoji | Win+Period |
| Undo | Ctrl+Z |
| Redo | Ctrl+Shift+Z |
| Cut | Ctrl+X |
| Copy | Ctrl+C |
| Paste | Ctrl+V |
| Paste as plain text | Ctrl+Shift+V |
| Select all | Ctrl+A |
| Spell check | > |
| Writing Direction | > |
| Get image descriptions from Google | > |
| Inspect | |

```
free software;  
ed in the
```

```
extent
```

```
backwards  
message:  
ion/
```

```
--code="4/0ARtbsJrUSRxEhX1gqVPgYGwZC6Vrgff0HQ0de8Nir5  
q8iA6s0kEizOYcFfHaSYONEqhJIA" --redirect-url="https://remotedesktop.google.com/ /oauthredirect" --name=$(hostna  
me)
```




Set up another computer

You're nearly finished! Run the following command on the remote computer to complete the setup process. Please note that this command can only be used to set up one computer; click Start over if you have more computers to set up.

Windows (Cmd)

```
"%PROGRAMFILES(X86)%\Google\Chrome Remote Desktop\CurrentVersion\remoting_start_host.exe" --code="4/0AY0e-g776BhtI3AMe8soEQQFEmBxqgVIBWhr3iQ3N1KwNj4yMwioQ35EjqM8vvxoeajmsA" --
```



Windows (PowerShell)

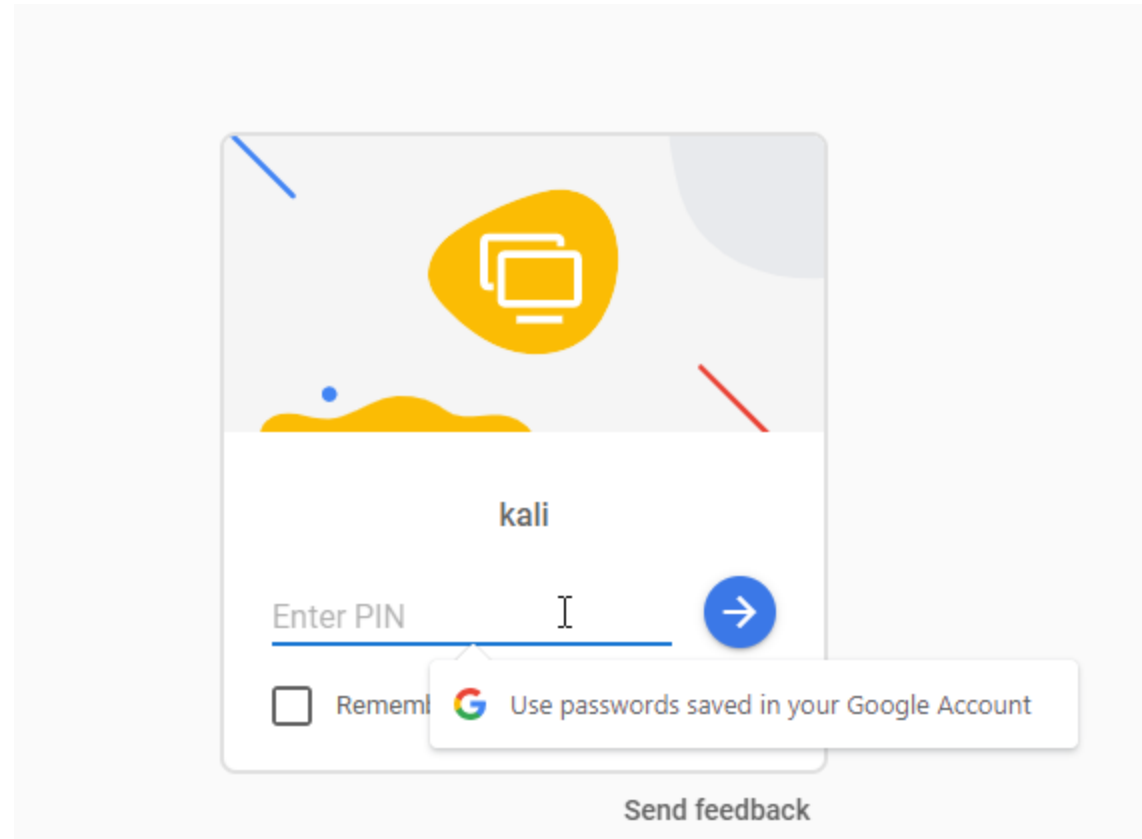
```
& "${Env:PROGRAMFILES(X86)}\Google\Chrome Remote Desktop\CurrentVersion\remoting_start_host.exe" --code="4/0AY0e-g776BhtI3AMe8soEQQFEmBxqgVIBWhr3iQ3N1KwNj4yMwioQ35EjqM8vvxoeajmsA" --
```



Debian Linux

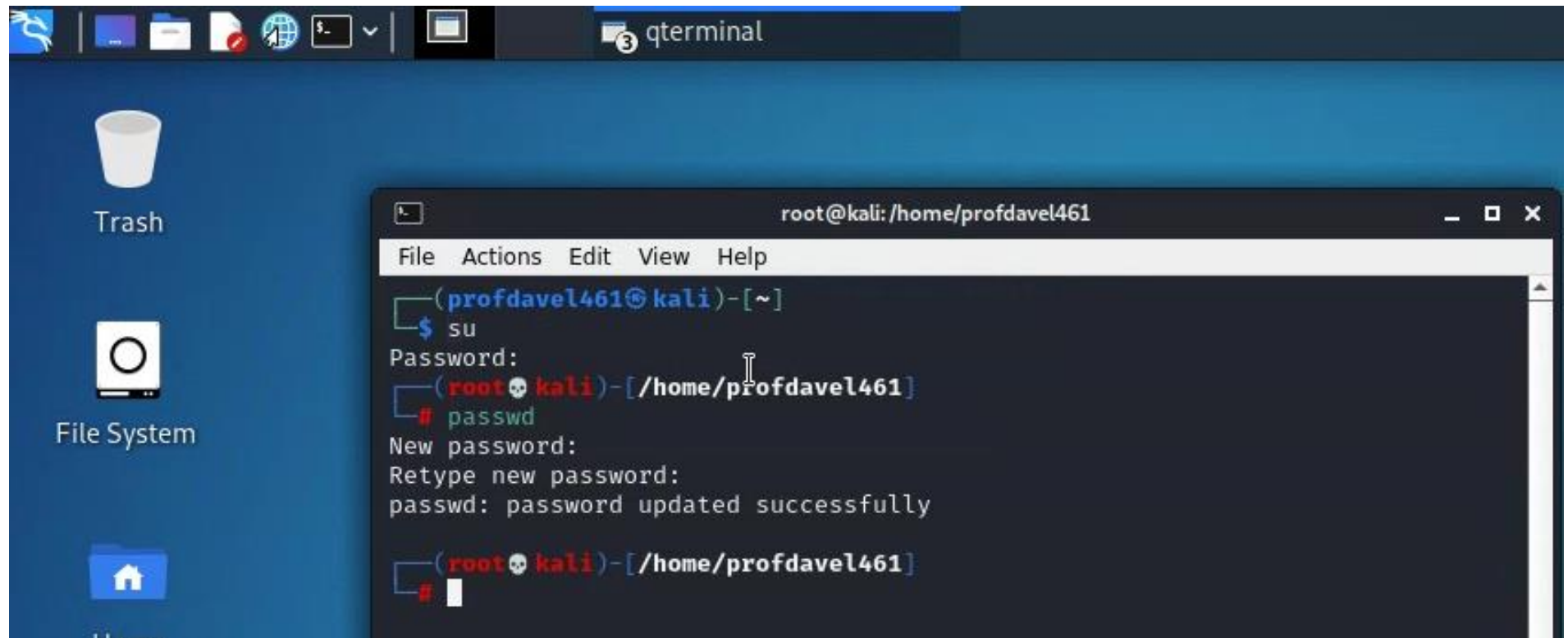
```
DISPLAY= /opt/google/chrome-remote-desktop/start-host --code="4/0AY0e-g776BhtI3AMe8soEQQFEmBxqgVIBWhr3iQ3N1KwNj4yMwioQ35EjqM8vvxoeajmsA" --redirect-url="https://remotedesktop.google.com/_oauthredirect" --
```





The password for Kali is “toor”

- Change the password from “toor” to something you will remember (or write down)



The screenshot shows a Kali Linux desktop environment with a blue background. On the left side, there are icons for 'Trash' and 'File System'. At the top, there is a taskbar with various application icons and a 'qterminal' window. The main focus is a terminal window titled 'root@kali: /home/profdave1461'. The terminal shows the following sequence of commands and output:

```
root@kali: /home/profdave1461
File Actions Edit View Help
(profdave1461@kali)-[~]
└─$ su
Password:
(profdave1461@kali)-[~/home/profdave1461]
└─# passwd
New password:
Retype new password:
passwd: password updated successfully
(profdave1461@kali)-[~/home/profdave1461]
└─#
```

```
profdavel461@kali: ~  
File Actions Edit View Help  
  
└─(profdavel461@kali)-[~]  
└─$ ls  
Desktop Downloads Music Public Videos  
Documents i-did-it.txt Pictures Templates  
  
└─(profdavel461@kali)-[~]  
└─$ cat i-did-it.txt  
Hello, world!  
  
└─(profdavel461@kali)-[~]  
└─$ echo "David Lanter david.lanter@temple.edu"  
David Lanter david.lanter@temple.edu  
  
└─(profdavel461@kali)-[~]  
└─$ date  
Mon Sep 26 11:12:13 PM EDT 2022  
  
└─(profdavel461@kali)-[~]  
└─$ █
```

Setup Budget Alerts

- Be sure to following instructions to setup budget alerts

Compute Engine

VM instances CREATE INSTANCE IMPORT VM REFRESH MANAGE ACCESS SHOW INFO PANEL

- Virtual machines
 - VM instances
 - Instance templates
 - Sole-tenant nodes
 - Machine images
 - TPUs
 - Migrate for Compute Engi...
 - Committed use discounts
- Storage
 - Disks
 - Snapshots
 - Images
- Instance groups
 - Instance groups
 - Health checks
- VM Manager
 - OS patch management

Filter VM instances Columns

| Name | Zone | Recommendation | In use by | Internal IP | External IP | Connect |
|---------------|---------------|----------------|-----------|-------------------|-------------|---------|
| kali-linux-vm | us-central1-a | | | 10.128.0.2 (nic0) | None | 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
- Setup Firewall Rules**
Control traffic to and from VM instance

- Start / Resume
- Stop
- Suspend
- Reset
- Delete
- View network details
- New machine image
- View logs
- View monitoring

Stopping VM instance "kali-linux-vm" succeeded. X

- Virtual machines
 - VM instances
 - Instance templates
 - Sole-tenant nodes
 - Machine images
 - TPUs
 - Committed use discounts
 - Migrate to Virtual Machin...
- Storage
 - Disks
 - Snapshots
 - Images
- Instance groups
 - Instance groups

Compute Engine VM instances [CREATE INSTANCE](#) [IMPORT VM](#) [REFRESH](#) [START / RESUME](#) [STOP](#) [SUSPEND](#) [RESET](#) [DELETE](#) [CREATE SCHEDULE](#) [OPERATIONS](#)

INSTANCES INSTANCE SCHEDULES

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

Filter Enter property name or value

| <input checked="" type="checkbox"/> | Status | Name ↑ | Zone | Recommendations | In use by | Internal IP | External IP | Connect |
|-------------------------------------|----------------|----------------------|---------------|-----------------|-----------|-------------------------------------|---------------------------------------|---------|
| <input checked="" type="checkbox"/> | ✓ | kali | us-central1-a | | | 10.128.0.2 (nic0) | 35.222.1.201 (nic0) | SSH ▾ ⋮ |

Related actions

- Explore Actifio GO**
Back up your VMs and set up disaster recovery
- 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 d 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

Actions menu: Start / Resume, Stop, Suspend, Reset, Delete, View network details, Create new machine image, View logs, View monitoring

- Virtual machines
 - VM instances
 - Instance templates
 - Sole-tenant nodes
 - Machine images
 - TPUs
 - Committed use discounts
 - Migrate to Virtual Machin...
- Storage
 - Disks
 - Snapshots
 - Images
- Instance groups
 - Instance groups

VM instances [CREATE INSTANCE](#) [IMPORT VM](#) [REFRESH](#) [START / RESUME](#) [STOP](#) [SUSPEND](#) [RESET](#) [DELETE](#) [CREATE SCHEDULE](#)

INSTANCES INSTANCE SCHEDULES

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

Filter Enter property name or value

| Status | Name | Zone | Recommendations | In use by | Internal IP | External IP | Connect |
|--------|------|---------------|-----------------|-----------|-------------------|---------------------|---------|
| ✓ | kali | us-central1-a | | | 10.128.0.2 (nic0) | 35.222.1.201 (nic0) | SSH |

Related actions

- Explore Actifio GO
Back up your VMs and set up disaster recovery
- View billing report
View and manage your Compute Engine billing
- Set up firewall rules
Control traffic to and from a VM instance
- Patch management
Schedule patch updates and view compliance on VM instances

Stop kali?

Stop shuts down the instance. If the shutdown doesn't complete within 90 seconds, the instance is forced to halt. This can lead to file-system corruption. Do you want to stop instance "kali"?

[CANCEL](#) [STOP](#)

- Virtual machines
 - VM instances
 - Instance templates
 - Sole-tenant nodes
 - Machine images
 - TPUs
 - Committed use discounts
 - Migrate to Virtual Machin...
- Storage
 - Disks
 - Snapshots
 - Images
- Instance groups
 - Instance groups
 - Health checks

INSTANCES INSTANCE SCHEDULES

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

Filter Enter property name or value

| <input checked="" type="checkbox"/> | Status | Name ↑ | Zone | Recommendations | In use by | Internal IP | External IP | Connect |
|-------------------------------------|--------|----------------------|---------------|-----------------|-----------|-------------------|-------------|---------|
| <input checked="" type="checkbox"/> | ● | kali | us-central1-a | | | 10.128.0.2 (nic0) | | SSH |

Related actions

Explore Actifio GO
Back up your VMs and set up disaster recovery

View billing report
View and manage your Compute Engine billing

Monitor VMs
View outlier VMs across metrics like CPU and network

Explore VM
View, search, and analyze 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

- Start / Resume
- Stop
- Suspend
- Reset
- Delete
- View network details
- Create new machine image
- View logs
- View monitoring

^ HIDE

One more time, but with detail...

...and how to make a better Kali compute engine setup that can handle Google's availability issues...

Get \$300 in free credits and free usage of 20+ products

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Contact sales



What's new in AI Developers Business leaders


AI EVENT OF THE YEAR

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PRODUCT ANNOUNCEMENT

Learn how to customize and deploy Gemini in Vertex AI



PRODUCT ANNOUNCEMENT

Deploy photorealistic image generation into production with Imagen 2 in Vertex AI



Try Google Cloud for free

Step 1 of 2 Account Information



Prof David
profdavid49@gmail.com

[SWITCH ACCOUNT](#)

Country

United States

By using this application, you agree to the [Google Cloud Platform](#), [Supplemental Free Trial](#), and [any applicable services and APIs](#) Terms of Service.

AGREE & CONTINUE

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

Access to all Google Cloud products

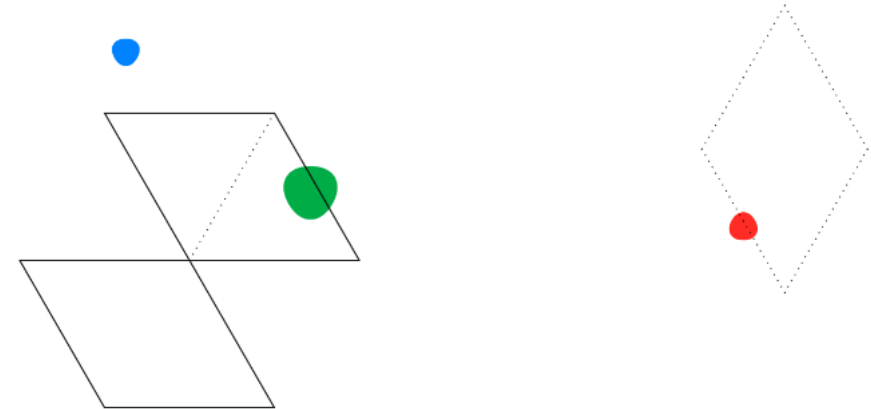
Get everything you need to build and run your apps, websites and services, including Firebase and the Google Maps API.


\$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. If you use a credit or debit card, you won't be charged unless you manually activate your full account.



 Try Google Cloud for free

Step 2 of 2 Payment Information Verification

Your payment information helps us reduce fraud and abuse. If using a credit or debit card, you won't be charged until you manually activate your account.






 Account type 

Individual

Only Business accounts can have multiple users. You cannot change the account type after signing up. In some countries, this selection affects your tax options. If you choose Individual as your account type, you agree that use of your account is for your trade, business, craft, or profession. [Learn more](#)

Payment method

 Add credit or debit card 

| | | | | |
|---|---|-----------------------------|------------------|-----------------|
| # | Card number | MM | YY | CVC |
| | <input type="text"/> | | | |
| |     | Month is required | Year is required | CVC is required |
| | Cardholder name | | | |
| | <input type="text" value="Prof David"/> | | | |
|  | Address line 1 | | | |
| | <input type="text"/> | | | |
| | Address line 1 is required | | | |
| | Address line 2 | | | |
| | <input type="text"/> | | | |
| | City | | | |
| | <input type="text"/> | | | |
| | City is required | | | |
| | State | ZIP code | | |
| | <input type="text"/> | <input type="text"/> | | |
| | State is required | ZIP code is required | | |

START FREE

Access to all Google Cloud products

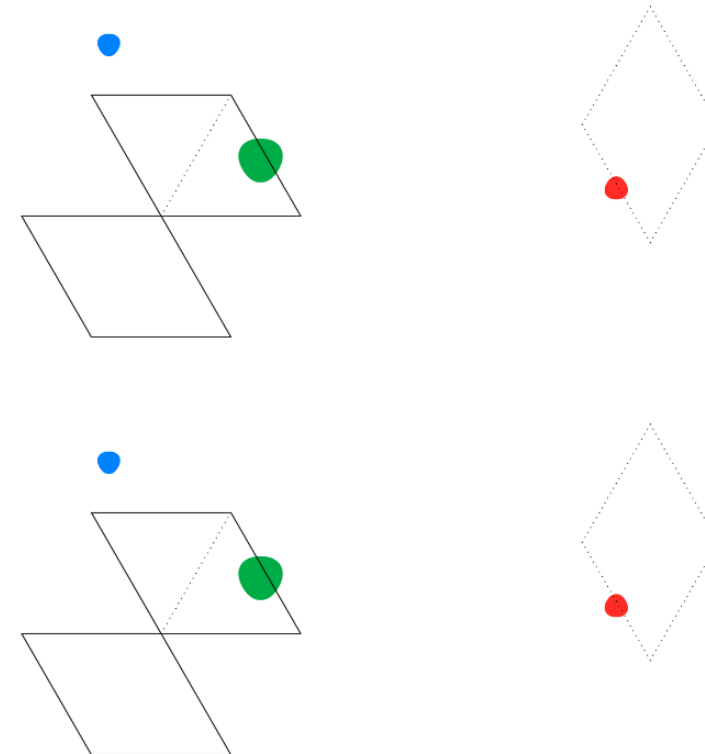
Get everything you need to build and run your apps, websites and services, including Firebase and the Google Maps API.

\$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. If you use a credit or debit card, you won't be charged unless you manually activate your full account.



Welcome Prof David!

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

1 What best describes your organization or needs?

Please select *

Large company

Mid-sized company

Small company

Startup

Business idea / startup idea

Helping clients use Cloud

Reselling Google Cloud services

Other

CLOSE

DONE

Welcome Prof David!

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

1 What best describes your organization or needs?

Please select *

Helping clients use Cloud

NEXT

2 What brought you to Google Cloud?

3 What are you interested in doing with Google Cloud?

4 What best describes your role?

CLOSE

DONE

Welcome, Prof David

You're working on project [My First Project](#)

Number: 858992398326 ID: unified-parser-411517

[Add people to your project](#)

[Set up budget alerts](#)

[Review product spend](#)

Experience Gemini, the multimodal model from Google DeepMind, now available in Vertex AI

[→](#)

Recommended based on your interest in General

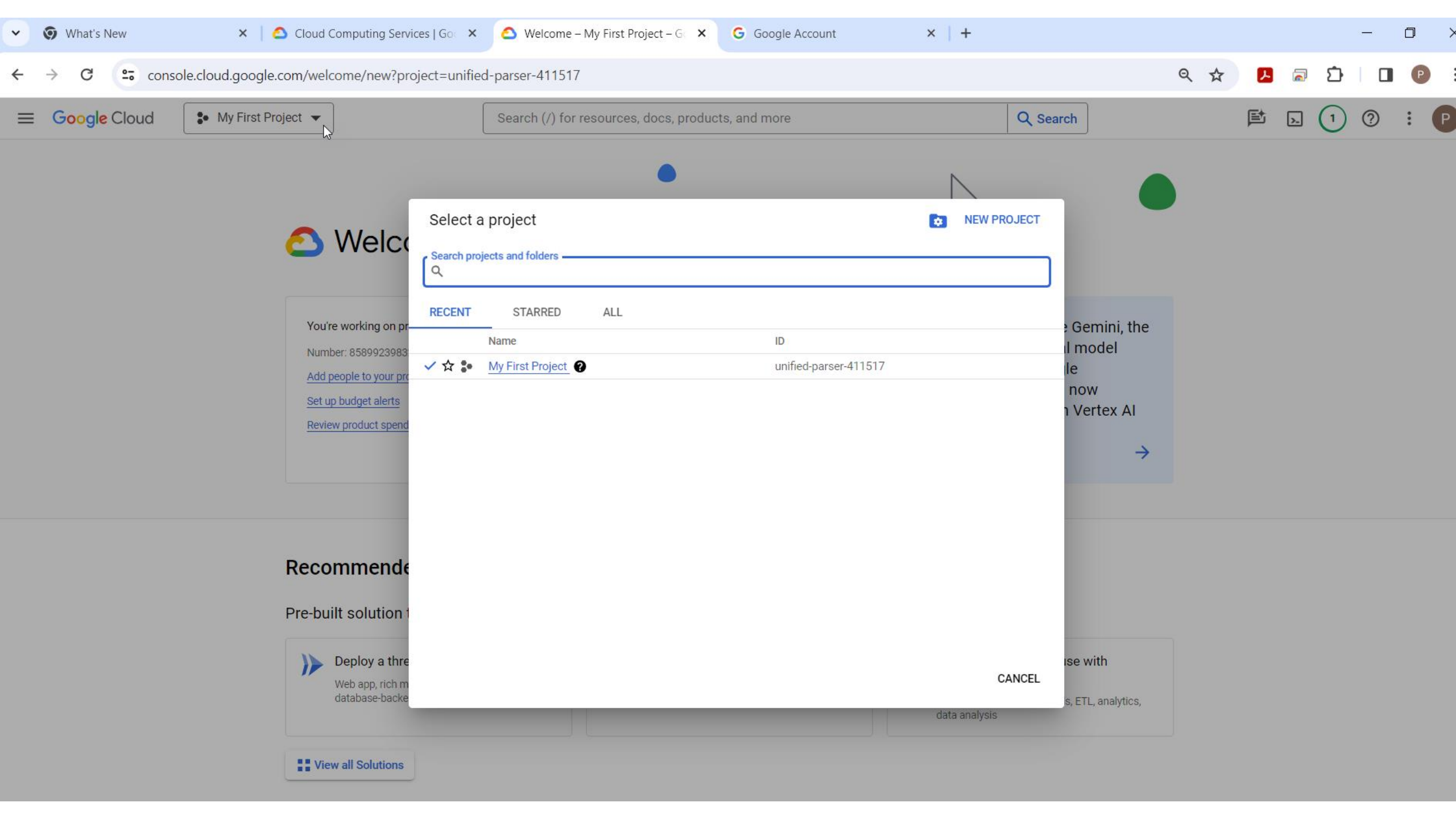
Pre-built solution templates

Deploy a three-tier web app
Web app, rich media site, ecommerce website, database-backed website

Deploy load balanced managed VMs
Data analysis, data pipeline, application logs, log management, log intelligence

Create a data warehouse with BigQuery
Data warehouse, dashboards, ETL, analytics, data analysis

[View all Solutions](#)



Select a project

 NEW PROJECT

Search projects and folders

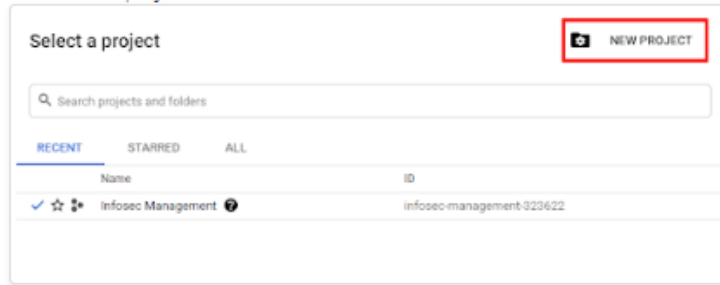
RECENT STARRED ALL

| Name | ID |
|--|-----------------------|
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> My First Project  | unified-parser-411517 |

CANCEL

- Return to <https://console.cloud.google.com>
- Then, create a new "project" which will house all of the material for this class.

1. Click "create project"



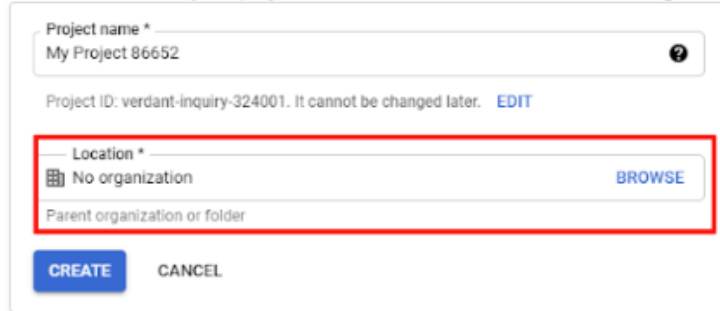
Select a project NEW PROJECT

Search projects and folders

RECENT STARRED ALL

| Name | ID |
|--------------------|---------------------------|
| Infosec Management | infosec-management-323622 |

2. Choose a name for your project, and for the "Location," choose "No Organization"



Project name *
My Project 86652

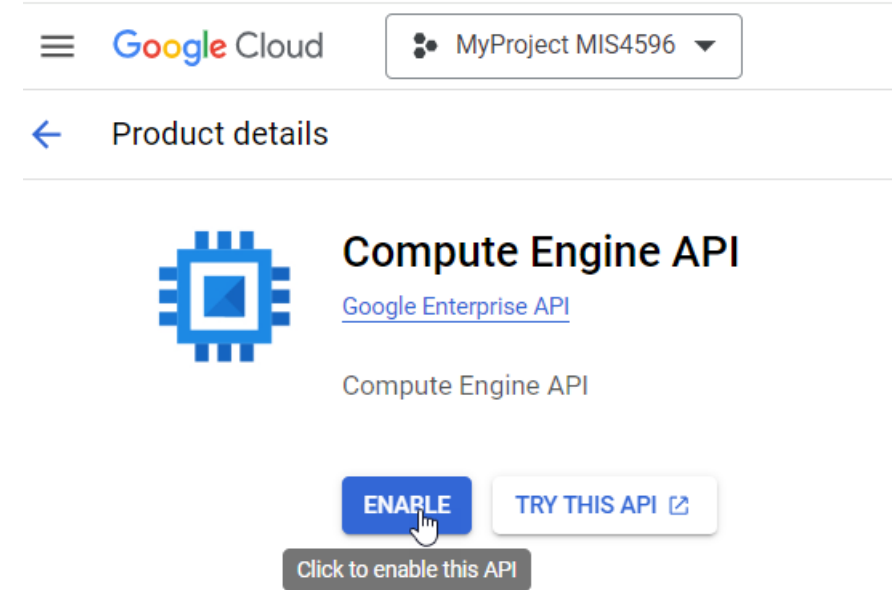
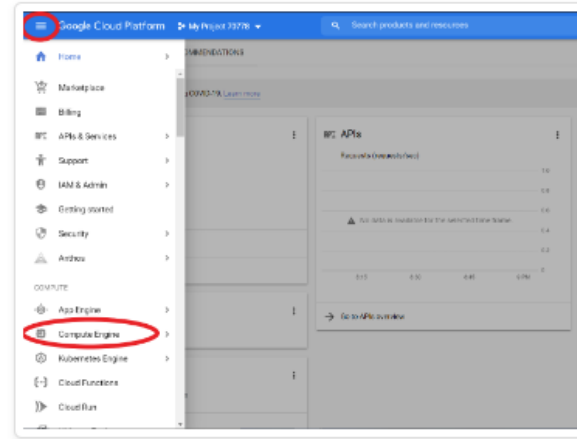
Project ID: verdant-inquiry-324001. It cannot be changed later. [EDIT](#)

Location *
No organization [BROWSE](#)

Parent organization or folder


[CREATE](#) [CANCEL](#)

- Then, expand the hamburger menu and navigate to the "Compute Engine" area. Click to enable. Wait a few minutes for Compute Engine to set up.



Google Cloud MyProject MIS4596

Product details

 **Compute Engine API**

[Google Enterprise API](#)

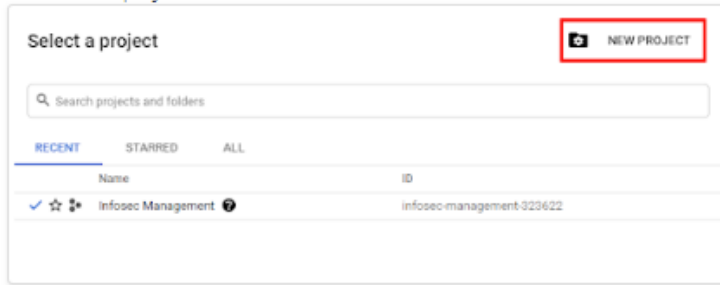
Compute Engine API

[ENABLE](#) [TRY THIS API](#)

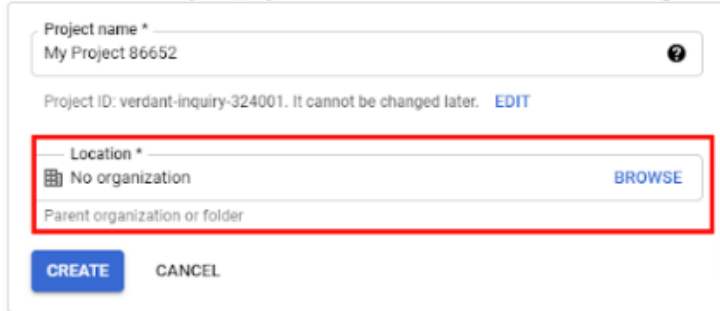
Click to enable this API

- Return to <https://console.cloud.google.com>
- Then, create a new "project" which will house all of the material for this class.

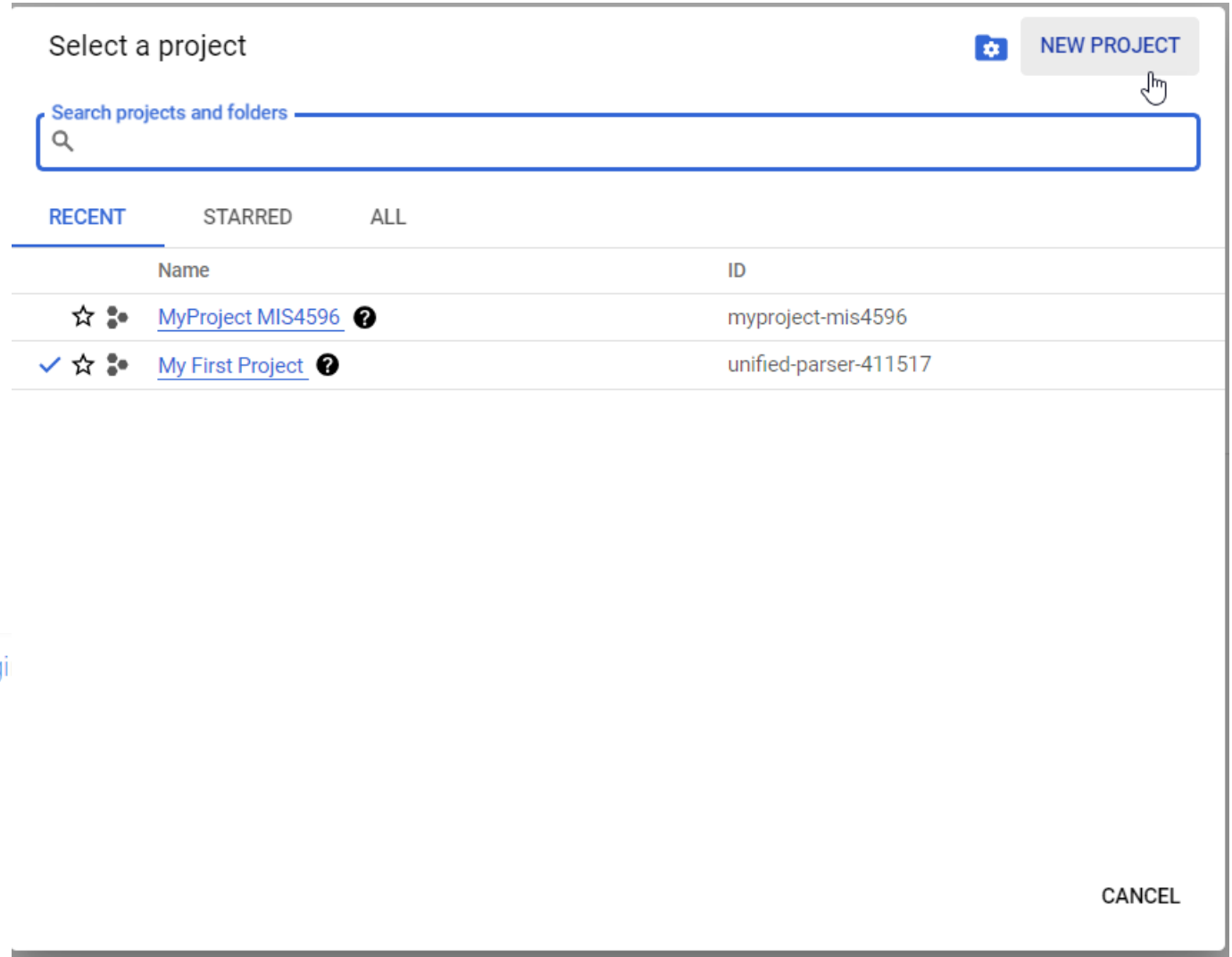
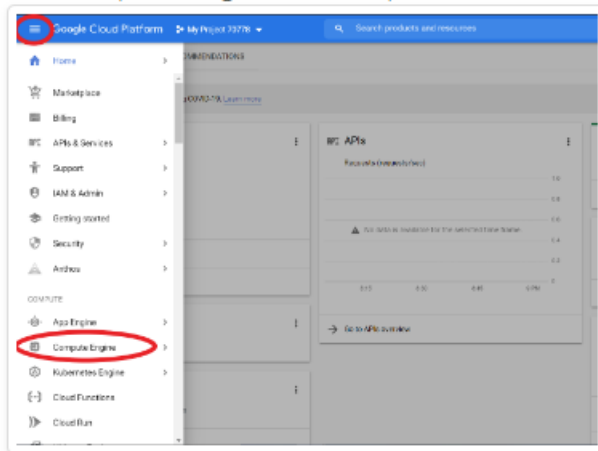
1. Click "create project"



2. Choose a name for your project, and for the "Location," choose "No Organization"



- Then, expand the hamburger menu and navigate to the "Compute Engi for Compute Engine to set up.



CANCEL

Create an instance

EQUIVALENT CODE

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 *
kali

MANAGE TAGS AND LABELS

Region *
us-central1 (Iowa)
Region is permanent

Zone *
us-central1-c
Zone is permanent

Machine configuration

- General purpose
- Compute optimized
- Memory optimized
- GPUs

Machine types for common workloads, optimized for cost and flexibility

| Series | Description | vCPUs | Memory | Platform |
|-------------------------------------|--------------------------------|-----------|--------------|----------------------------|
| <input type="radio"/> C3 | Consistently high performance | 4 - 176 | 8 - 1,408 GB | Intel Sapphire Rapids |
| <input type="radio"/> C3D | Consistently high performance | 4 - 360 | 8 - 2,880 GB | AMD Genoa |
| <input type="radio"/> E2 | Low cost, day-to-day computing | 0.25 - 32 | 1 - 128 GB | Based on availability |
| <input type="radio"/> N2 | Balanced price & performance | 2 - 128 | 2 - 864 GB | Intel Cascade and Ice Lake |
| <input type="radio"/> N2D | Balanced price & performance | 2 - 224 | 2 - 896 GB | AMD EPYC |
| <input type="radio"/> T2A | Scale-out workloads | 1 - 48 | 4 - 192 GB | Ampere Altra Arm |
| <input type="radio"/> T2D | Scale-out workloads | 1 - 60 | 4 - 240 GB | AMD EPYC Milan |
| <input checked="" type="radio"/> N1 | Balanced price & 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](#)

Monthly estimate

\$98.09

That's about \$0.13 hourly

Pay for what you use: no upfront costs and per second billing

| Item | Monthly estimate |
|--------------------------------|------------------|
| 4 vCPU + 15 GB memory | \$138.70 |
| 10 GB balanced persistent disk | \$1.00 |
| Use discount | -\$41.61 |
| Total | \$98.09 |

[Compute Engine pricing](#)

LESS

CREATE CANCEL EQUIVALENT CODE

Create an instance

EQUIVALENT CODE

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

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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

n1-standard-4 (4 vCPU, 2 core, 15 GB memory)



| vCPU | Memory |
|-------------|--------|
| 4 (2 cores) | 15 GB |

ADVANCED CONFIGURATIONS

Availability policies

VM provisioning model: Standard

Choose "Spot" to get a discounted, preemptible VM. Otherwise, stick to "Standard". [Learn more](#)

VM PROVISIONING MODEL ADVANCED SETTINGS

Display device

Enable to use screen capturing and recording tools.

Enable display device

Confidential VM service

Confidential Computing is disabled on this VM instance

ENABLE

Container

Deploy a container image to this VM instance

DEPLOY CONTAINER

Monthly estimate

\$98.09

That's about \$0.13 hourly

Pay for what you use: no upfront costs and per second billing

| Item | Monthly estimate |
|--------------------------------|------------------|
| 4 vCPU + 15 GB memory | \$138.70 |
| 10 GB balanced persistent disk | \$1.00 |
| Use discount | -\$41.61 |
| Total | \$98.09 |

[Compute Engine pricing](#)

LESS

CREATE

CANCEL

EQUIVALENT CODE

Create an instance

- 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

n1-standard-4 (4 vCPU, 2 core, 15 GB memory)

| | | |
|--|-------------|---------------|
| | vCPU | Memory |
| | 4 (2 cores) | 15 GB |

CPU platform

- Automatic
- Intel Skylake or later
- Intel Broadwell or later
- Intel Haswell or later**
- Intel Ivy Bridge or later
- Intel Sandy Bridge or later

Availability policies

VM provisioning model: Standard

Choose "Spot" to get a discounted, preemptible VM. Otherwise, stick to "Standard". [Learn more](#)

VM PROVISIONING MODEL ADVANCED SETTINGS

Display device

Enable to use screen capturing and recording tools.

Enable display device

Confidential VM service

Monthly estimate

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| 4 vCPU + 15 GB memory | \$138.70 |
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| Total | \$98.09 |

[Compute Engine pricing](#)

[LESS](#)

Create an instance

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Create a single VM instance from scratch
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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

ENABLE

Container

Deploy a container image to this VM instance

DEPLOY CONTAINER

Boot disk

| | |
|--------------|--------------------------------|
| Name | kali |
| Type | New balanced persistent disk |
| Size | 10 GB |
| License type | Free |
| Image | Debian GNU/Linux 11 (bullseye) |

CHANGE

Identity and API access

Service accounts

Service account
Compute Engine default service account

Requires the Service Account User role (roles/iam.serviceAccountUser). [Learn more](#)

Access scopes

Allow default access

Allow full access to all Cloud APIs

CREATE

CANCEL

EQUIVALENT CODE

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

ARCHIVE SNAPSHOTS

EXISTING DISKS

Operating system
Debian

Version *
Debian GNU/Linux 11 (bullseye)

x86/64, amd64 built on 20240110

Boot disk type *
Balanced persistent disk

COMPARE DISK TYPES

Size (GB) *
10

Provision between 10 and 65536 GB

SHOW ADVANCED CONFIGURATION

SELECT

CANCEL

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

ENABLE

Container ?

Deploy a container image to this VM instance

DEPLOY CONTAINER

Boot disk ?

| | |
|----------------|------------------------------|
| Name | kali |
| Type | New balanced persistent disk |
| Size | 10 GB |
| License type ? | Free |
| Image | Debian GNU/Linux 11 (bu |

CHANGE

Identity and API access ?

Service accounts ?

Service account
Compute Engine default service account

Requires the Service Account User role (roles/iam.serviceAccountUser). [Learn more](#)

Access scopes ?

- Allow default access
- Allow full access to all Cloud APIs

CREATE

CANCEL

EQUIVALENT CODE

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

ARCHIVE SNAPSHOTS

EXISTING DISKS

Source project for images *
security-assignments-kali

? CHANGE

Show deprecated images

Image *
kali-v3-1-1

Created on Aug 1, 2023, 2:52:26 AM

Boot disk type *
Balanced persistent disk

COMPARE DISK TYPES

Size (GB) *
500

Provision between 500 and 65536 GB

SHOW ADVANCED CONFIGURATION

SELECT

CANCEL

Create an instance

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

ENABLE

Container ?

Deploy a container image to

DEPLOY CONTAINER

Boot disk ?

Name

Type

Size

License type ?

Image

CHANGE

Identity and API a

Service accounts ?

Service account

Compute Engine default

Requires the Service Account
account. [Learn more](#)

Access scopes ?

Allow default access

Allow full access to all Cloud APIs

CREATE

CANCEL

EQUIVALENT CODE

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](#)

SNAPSHOTS

EXISTING DISKS

Select a project

NEW PROJECT

Search projects and folders

RECENT STARRED ALL

| Name | ID |
|---|---------------------------|
| No organization | 0 |
| My First Project | unified-parser-411517 |
| MyProject MIS4596 | myproject-mis4596 |
| security-assignments-kali | security-assignments-kali |

CANCEL

Google Cloud MyProject MIS4596 Search (/) for res

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

ENABLE

Container

Deploy a container image to this VM instance

DEPLOY CONTAINER

Boot disk

| | |
|--------------|------------------------------|
| Name | kali |
| Type | New balanced persistent disk |
| Size | 10 GB |
| License type | Free |
| Image | Debian GNU/Linux 11 (bu |

CHANGE

Identity and API access

Service accounts

Service account
Compute Engine default service account

Requires the Service Account User role (roles/iam.serviceAccountUser). [Learn more](#)

Access scopes

- Allow default access
- Allow full access to all Cloud APIs

CREATE **CANCEL** **EQUIVALENT CODE**

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 ARCHIVE SNAPSHOTS EXISTING DISKS

Source project for images * security-assignments-kali **CHANGE**

Show deprecated images

Image *

Filter Type to filter

kali-v3-1-1
Created on Aug 1, 2023, 2:52:26 AM

COMPARE DISK TYPES

Size (GB) * 500

Provision between 500 and 65536 GB

SHOW ADVANCED CONFIGURATION

SELECT **CANCEL**

- ### 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

Size 300 GB
License type **Free**
Image kali-v3-1-1

[CHANGE](#)

Identity and API access

Service accounts

Service account
Compute Engine default service account

Requires the Service Account User role (roles/iam.serviceAccountUser) to be set for users who want to access VMs with this service account. [Learn more](#)

- 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
 - Allow Load Balancer Health Checks

Advanced options

Networking, disks, security, management, sole-tenancy

Monthly estimate

\$117.09
That's about \$0.16 hourly
Pay for what you use: no upfront costs and per second billing

| Item | Monthly estimate |
|---------------------------------|------------------|
| 4 vCPU + 15 GB memory | \$138.70 |
| 500 GB standard persistent disk | \$20.00 |
| Use discount | -\$41.61 |
| Total | \$117.09 |

[Compute Engine pricing](#)

[^ LESS](#)

- Google Cloud
- MyProject MIS4596
- Search (/) for resources, docs, products, and more
- Search
- Compute Engine
- Virtual machines
 - VM instances
 - Instance templates
 - Sole-tenant nodes
 - Machine images
 - TPUs
 - Committed use discounts
 - Reservations
 - Migrate to Virtual Machin...
- Storage
 - Disks
 - Snapshots
 - Images
 - Async Replication
- Marketplace
- Release Notes

VM instances [CREATE INSTANCE](#) [IMPORT VM](#) [REFRESH](#)

[INSTANCES](#) [OBSERVABILITY](#) [INSTANCE SCHEDULES](#)

VM instances

Filter Enter property name or value

| <input type="checkbox"/> | Status | Name ↑ | Zone | Recommendations | In use by | Internal IP | External IP | Connect |
|--------------------------|--------|----------------------|---------------|-----------------|-----------|-------------------------------------|---------------------------------------|---------|
| <input type="checkbox"/> | ✓ | kali | us-central1-c | | | 10.128.0.2 (nic0) | 34.42.134.50 (nic0) | SSH ▾ ⋮ |

Related actions

- [Explore Backup and DR](#) **NEW**
Back up your VMs and set up disaster recovery
- [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
- [Load balance between VMs](#) [↗](#)
Set up Load Balancing for your applications as your traffic and users grow

[LEARN](#)

[HIDE](#)

```
Linux kali 5.10.0-kali7-amd64 #1 SMP Debian 5.10.28-1kali1 (2021-04-12) x86_64
```

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

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

```
(Message from Kali developers)
```

```
We have kept /usr/bin/python pointing to Python 2 for backwards  
compatibility. Learn how to change this and avoid this message:  
=> https://www.kali.org/docs/general-use/python3-transition/
```

```
(Run: "touch ~/.hushlogin" to hide this message)
```

```
(profdavid49@kali) ~
```

```
$
```

| External IP | Connect |
|---------------|---------|
| 134.50 (nic0) | SSH |

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

Connect between VMs
Connect your applications and services across VMs to help them grow

Now with details...

Compute Engine

VM instances

[CREATE INSTANCE](#)

[IMPORT VM](#)

[REFRESH](#)

[LEARN](#)

[INSTANCES](#)

[OBSERVABILITY](#)

[INSTANCE SCHEDULES](#)

VM instances

[Filter](#) Enter property name or value

| <input type="checkbox"/> | Status | Name ↑ | Zone | Recommendations | In use by | Internal IP | External IP | Connect |
|--------------------------|--------|----------------------|---------------|-----------------|-----------|-------------------------------------|-------------|---------|
| <input type="checkbox"/> | | kali | us-central1-c | | | 10.128.0.2 (nic0) | | SSH ▾ ⋮ |

Related actions

[Explore Backup and DR](#) **NEW**
Back up your VMs and set up disaster recovery

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View and manage your Compute Engine billing

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View outlier VMs across metrics like CPU and network

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Control traffic to and from a VM instance

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Set up Load Balancing for your applications as your traffic and users grow

- Virtual machines
- VM instances
- Instance templates
- Sole-tenant nodes
- Machine images
- TPUs
- Committed use discounts
- Reservations
- Migrate to Virtual Machin...
- Storage
- Disks
- Snapshots
- Images

[HIDE](#)

Create an instance

create a VM instance, select one of the options:

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

Name *
kali-2

MANAGE TAGS AND LABELS

Region *
us-central1 (Iowa)
Region is permanent

Zone *
Any
Google will choose a zone on your behalf, maximizing VM obtainability. Zone is permanent.

Monthly estimate

\$25.27

That's about \$0.03 hourly

Pay for what you use: no upfront costs and per second billing

| Item | Monthly estimate |
|--------------------------------|------------------|
| 1 vCPU + 3.75 GB memory | \$34.67 |
| 10 GB balanced persistent disk | \$1.00 |
| Use discount | -\$10.40 |
| Total | \$25.27 |

Machine configuration

General

Machine types

| Machine type | Scale-out workloads | vCPUs | Memory | Processor |
|-------------------------------------|------------------------------|-----------|--------------|------------------|
| <input type="radio"/> C2 | Scale-out workloads | 1 - 48 | 4 - 192 GB | Ampere Altra ARM |
| <input type="radio"/> C3 | Scale-out workloads | 1 - 48 | 4 - 192 GB | Ampere Altra ARM |
| <input type="radio"/> E2 | Scale-out workloads | 1 - 48 | 4 - 192 GB | AMD EPYC Milan |
| <input type="radio"/> N1 | Balanced price & performance | 0.25 - 96 | 0.6 - 624 GB | Intel Skylake |
| <input type="radio"/> N2 | Balanced price & performance | 0.25 - 96 | 0.6 - 624 GB | Intel Skylake |
| <input type="radio"/> T2A | Scale-out workloads | 1 - 48 | 4 - 192 GB | Ampere Altra ARM |
| <input type="radio"/> T2D | Scale-out workloads | 1 - 60 | 4 - 240 GB | AMD EPYC Milan |
| <input checked="" type="radio"/> N1 | Balanced price & 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

n1-standard-1 (1 vCPU, 3.75 GB memory)

| Icon | vCPU | Memory |
|------|------|---------|
| | 1 | 3.75 GB |

ADVANCED CONFIGURATIONS

← Create an instance

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

- New VM instance**
Create a single VM instance from scratch
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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 *
kali-2

MANAGE TAGS AND LABELS

Region *
us-central1 (Iowa)

Region is permanent

Zone *
Any

Google will choose a zone on your behalf, maximizing VM obtainability. Zone is permanent.

Machine configuration

- General purpose**
- Compute optimized
- Memory optimized
- GPUs

Machine types for common workloads, optimized for cost and flexibility

| Series | Description | vCPUs | Memory | Platform |
|--------|--------------------------------|-----------|--------------|-----------------------|
| C3 | Consistently high performance | 4 - 176 | 8 - 1,408 GB | Intel Sapphire Rapids |
| C3D | Consistently high performance | 4 - 360 | 8 - 2,880 GB | AMD Genoa |
| E2 | Low cost, day-to-day computing | 0.25 - 32 | 1 - 128 GB | Based on availability |

Filter Instance sizes

| Category | Instance Size | Configuration |
|-------------|----------------------|--------------------------------|
| Shared-core | n1-standard-1 | 1 vCPU, 3.75 GB memory |
| | n1-standard-2 | 2 vCPU (1 core), 7.5 GB memory |
| Standard | n1-standard-4 | 4 vCPU (2 core), 15 GB memory |
| | n1-standard-8 | 8 vCPU (4 core), 30 GB memory |
| | n1-standard-16 | 16 vCPU (8 core), 60 GB memory |

| Icon | vCPU | Memory |
|------|------|---------|
| | 1 | 3.75 GB |

Monthly estimate

\$25.27

That's about \$0.03 hourly

Pay for what you use: no upfront costs and per second billing

| Item | Monthly estimate |
|--------------------------------|------------------|
| 1 vCPU + 3.75 GB memory | \$34.67 |
| 10 GB balanced persistent disk | \$1.00 |
| Use discount | -\$10.40 |
| Total | \$25.27 |

[Compute Engine pricing](#)

LESS

| | | | | | |
|----------------------------------|------------|------------------------------|-----------|--------------|----------------|
| <input type="radio"/> | I2D | Scale-out workloads | 1 - 60 | 4 - 240 GB | AMD EPYC Milan |
| <input checked="" type="radio"/> | N1 | Balanced price & 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

n1-standard-4 (4 vCPU, 2 core, 15 GB memory)



vCPU

4 (2 cores)

Memory

15 GB

ADVANCED CONFIGURATIONS

Availability policies

VM provisioning model
Standard

Choose "Spot" to get a discounted, preemptible VM. Otherwise, stick to "Standard". [Learn more](#)

VM PROVISIONING MODEL ADVANCED SETTINGS

Display device

Enable to use screen capturing and recording tools.

| | | | | | |
|----------------------------------|------------|------------------------------|-----------|--------------|----------------|
| <input type="radio"/> | T2D | Scale-out workloads | 1 - 60 | 4 - 240 GB | AMD EPYC Milan |
| <input checked="" type="radio"/> | N1 | Balanced price & 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

n1-standard-4 (4 vCPU, 2 core, 15 GB memory)



vCPU

4 (2 cores)

Memory

15 GB

CPU platform Automatic

vCPUs to core ratio

Visible core count

ADVANCED CONFIGURATIONS

Availability policies

VM provisioning model Standard

Choose "Spot" to get a discounted, preemptible VM. Otherwise, stick to "Standard". [Learn more](#)

VM PROVISIONING MODEL ADVANCED SETTINGS

\$98.09

That's about \$0.13 hourly

Pay for what you use: no upfront costs ar

| Item |
|--------------------------------|
| 4 vCPU + 15 GB memory |
| 10 GB balanced persistent disk |
| Use discount |
| Total |

[Compute Engine pricing](#)

LESS

| | | | | | |
|----------------------------------|------------|------------------------------|-----------|--------------|----------------|
| <input type="radio"/> | T2D | Scale-out workloads | 1 - 60 | 4 - 240 GB | AMD EPYC Milan |
| <input checked="" type="radio"/> | N1 | Balanced price & 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

n1-standard-4 (4 vCPU, 2 core, 15 GB memory)



vCPU
4 (2 cores)

Memory
15 GB

CPU platform

- Automatic
- Intel Skylake or later
- Intel Broadwell or later
- Intel Haswell or later
- Intel Ivy Bridge or later
- Intel Sandy Bridge or later

Availability policies

VM provisioning model

Standard

Choose "Spot" to get a discounted, preemptible VM. Otherwise, stick to "Standard". [Learn more](#)

\$98.09

That's about \$0.13 hourly

Pay for what you use: no upfront

| Item |
|--------------------------------|
| 4 vCPU + 15 GB memory |
| 10 GB balanced persistent disk |
| Use discount |
| Total |

[Compute Engine pricing](#)

^ LESS

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

Display device

Enable to use screen capturing and recording tools.

Enable display device

Confidential VM service ?

Confidential Computing is disabled on this VM instance

ENABLE

Container ?

Deploy a container image to this VM instance

DEPLOY CONTAINER

Boot disk ?

| | |
|-----------------------------|--|
| Name | kali-2 |
| Type | New balanced persistent disk |
| Size | 10 GB |
| License type ? | Free |
| Image |  Debian GNU/Linux 12 (bookworm) |

CHANGE

Identity and API access ?

Service accounts ?

Service account

Compute Engine default service account

Requires the Service Account User role (roles/iam.serviceAccountUser) to be set for users who want to access VMs with this service account. [Learn more](#)

Access scopes ?

Allow default access

CREATE

CANCEL

 EQUIVALENT CODE

Monthly estimate

\$98.09

That's about \$0.13 hourly

Pay for what you use: no upfront costs and per second billing

| Item | Monthly estimate |
|--------------------------------|------------------|
| 4 vCPU + 15 GB memory | \$138.70 |
| 10 GB balanced persistent disk | \$1.00 |
| Use discount | -\$41.61 |
| Total | \$98.09 |

[Compute Engine pricing](#)

[^ LESS](#)

Free trial status: \$280.89 credit and 78 days remaining. Activate your full account to get unlimited access to all of Google Cloud—use any remaining credits, then pay only for what you use.

Google Cloud MyProject MIS4596 Search (/) for resources, docs, products, and more

Create an instance

create a VM instance, select one of the options:

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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

ENABLE

Container

Deploy a container image to this VM instance

DEPLOY CONTAINER

Boot disk

| | |
|--------------|--------------------------------|
| Name | kali-2 |
| Type | New balanced persistent disk |
| Size | 10 GB |
| License type | Free |
| Image | Debian GNU/Linux 12 (bookworm) |

CHANGE

Identity and API access

Service accounts

Service account: Compute Engine default service account

Requires the Service Account User role (roles/iam.serviceAccountUser) to be set for users who want to access VMs with this service account. [Learn more](#)

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
- Allow Load Balancer Health Checks

CREATE CANCEL [EQUIVALENT CODE](#)

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 ARCHIVE SNAPSHOTS EXISTING DISKS

Operating system: Debian

Version *: Debian GNU/Linux 12 (bookworm)
x86/64, amd64 built on 20240110

Boot disk type *: Balanced persistent disk

COMPARE DISK TYPES

Size (GB) *: 10
Provision between 10 and 65536 GB

SHOW ADVANCED CONFIGURATION

SELECT CANCEL

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

ARCHIVE SNAPSHOTS

EXISTING DISKS

Source project for images *

myproject-mis4596



CHANGE

Show deprecated images

Image *

Image is required



Boot disk type *

Balanced persistent disk

[COMPARE DISK TYPES](#)

Size (GB) *

10

Provision between 10 and 65536 GB

[SHOW ADVANCED CONFIGURATION](#)

SELECT

CANCEL

ess to all of Google Cloud—use any remaining credits, then pay only for what you use.

Search (/) for resources, docs, products, and more

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 ARCHIVE SNAPSHOTS EXISTING DISKS

Source project for images *
myproject-mis4596 CHANGE

Select a project

NEW PROJECT

Search projects and folders

RECENT STARRED **ALL**

Name ID

No organization

My First Project

MyProject MIS4596

security-assignments-kali

Select a project

Search projects and folders

RECENT STARRED **ALL**

Name ID

No organization

My First Project unified-;

MyProject MIS4596 myproje

security-assignments-kali security

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 ARCHIVE SNAPSHOTS

Source project for images *
security-assignments-kali CHANGE

Show deprecated images

Image *

Image is required

PUBLIC IMAGES CUSTOM IMAGES SNAPSHOTS ARCHIVE SNAPSHOTS

Source project for images *
security-assignments-kali CHANGE

Show deprecated images

Image *

Filter | Type to filter

kali-v3-1-1

Created on Aug 1, 2023, 2:52:26 AM

SELECT

COMPARE DISK TYPES

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 ARCHIVE SNAPSHOTS

Source project for images *
security-assignments-kali

 CHANGE

Show deprecated images

Image *
kali-v3-1-1

Created on Aug 1, 2023, 2:52:26 AM

Boot disk type *
Balanced persistent disk

COMPARE DISK TYPES

Size (GB) *
500

Provision between 500 and 65536 GB

SHOW ADVANCED CONFIGURATION

SELECT

CANCEL

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 ARCHIVE SNAPSHOTS EXISTING

Source project for images *
security-assignments-kali

Show deprecated images

Image *
kali-v3-1-1

Created on Aug 1, 2023, 2:52:26 AM

Boot disk type *
Balanced persistent disk
Extreme persistent disk
SSD persistent disk
Standard persistent disk

Provision between 500 and 65536 GB

SHOW ADVANCED CONFIGURATION

SELECT


CANCEL

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 ARCHIVE SNAPSHOTS EXISTING

Source project for images *
security-assignments-kali

 CHANGE

Show deprecated images

Image *
kali-v3-1-1

Created on Aug 1, 2023, 2:52:26 AM

Boot disk type *
Standard persistent disk

COMPARE DISK TYPES

Size (GB) *
500

Provision between 500 and 65536 GB

SHOW ADVANCED CONFIGURATION

SELECT

CANCEL



Search

! Make sure all fields are correct to continue GO TO ISSUE(S)

- 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

! Make sure all fields are correct to continue GO TO ISSUE(S)

Name *
kali-2

MANAGE TAGS AND LABELS

Region *
us-central1 (Iowa)
Region is permanent

Zone *
Any
Google will choose a zone on your behalf, maximizing VM obtainability. Zone is permanent.

Machine configuration

- General purpose** | Compute optimized | Memory optimized | GPU optimized

Machine types for common workloads, optimized for cost and flexibility

| Series | Description | vCPUs |
|-------------------------------------|--------------------------------|-----------|
| <input type="radio"/> C3 | Consistently high performance | 4 - 176 |
| <input type="radio"/> C3D | Consistently high performance | 4 - 360 |
| <input type="radio"/> E2 | Low cost, day-to-day computing | 0.25 - 32 |
| <input type="radio"/> N2 | Balanced price & performance | 2 - 128 |
| <input type="radio"/> N2D | Balanced price & performance | 2 - 224 |
| <input type="radio"/> T2A | Scale-out workloads | 1 |
| <input type="radio"/> T2D | Scale-out workloads | 1 |
| <input checked="" type="radio"/> N1 | Balanced price & performance | 0 |

Machine type

Choose a machine type with preset amounts of vCPUs and memory. Or, you can create a custom machine for your workload's particular needs.

- PRESET
- CUSTOM

n1-standard-4 (4 vCPU, 2 core, 15 GB memory)

Choose "Spot" to get a discounted, preemptible VM. Otherwise, stick to "Standard". [Learn more](#)

Set a time limit for the VM

Time limit type
By hours

Enter number of hours*

! This field is required

On VM termination
Stop

2 - 896 GB | AMD EPYC

Availability policies

VM provisioning model
Standard

Choose "Spot" to get a discounted, preemptible VM. Otherwise, stick to "Standard". [Learn more](#)

Set a time limit for the VM

On VM termination

Choose what happens to your VM when it's preempted or reaches its time limit

On host maintenance
Migrate VM instance (Recommended)

- CREATE**
- CANCEL
- EQUIVALENT CODE

Monthly estimate

\$117.09

That's about \$0.16 hourly

Pay for what you use: no upfront costs and per second billing

| Item | Monthly estimate |
|---------------------------------|------------------|
| 4 vCPU + 15 GB memory | \$138.70 |
| 500 GB standard persistent disk | \$20.00 |
| Use discount | -\$41.61 |
| Total | \$117.09 |

[Compute Engine pricing](#)

[LESS](#)



← 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

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

n1-standard-4 (4 vCPU, 2 core, 15 GB memory)



vCPU
4 (2 cores)

Memory
15 GB

ADVANCED CONFIGURATIONS

Availability policies

VM provisioning model

Standard

Choose "Spot" to get a discounted, preemptible VM. Otherwise, stick to "Standard". [Learn more](#)

Set a time limit for the VM ?

On VM termination

Choose what happens to your VM when it's preempted or reaches its time limit

On host maintenance

Migrate VM instance (Recommended)

When Compute Engine performs periodic infrastructure maintenance it can migrate your VM instances to other hardware without downtime

Automatic restart

On (recommended)

Compute Engine can automatically restart VM instances if they are terminated for non-user-initiated reasons (maintenance event, hardware failure, software failure and so on)

VM PROVISIONING MODEL ADVANCED SETTINGS

Display device

Enable to use screen capturing and recording tools.

Enable display device

Confidential VM service ?

CREATE

CANCEL

EQUIVALENT CODE

Monthly estimate

\$117.09

That's about \$0.16 hourly

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| Item | Monthly estimate |
|---------------------------------|------------------|
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LESS

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Google Cloud

MyProject MIS4596

Search (/) for resources, docs, products, and more

Search

Compute Engine

VM instances

CREATE INSTANCE

IMPORT VM

REFRESH

INSTANCES

OBSERVABILITY

INSTANCE SCHEDULES

VM instances

Filter Enter property name or value

| <input type="checkbox"/> | Status | Name ↑ | Zone | Recommendations | In use by | Internal IP | External IP | Connect |
|--------------------------|--------|------------------------|---------------|-----------------|-----------|-------------------------------------|--|---------|
| <input type="checkbox"/> | ⦿ | kali | us-central1-c | | | 10.128.0.2 (nic0) | | SSH ▾ ⋮ |
| <input type="checkbox"/> | ✔ | kali-2 | us-central1-f | | | 10.128.0.3 (nic0) | 34.27.118.245 (nic0) | SSH ▾ ⋮ |

Related actions

🔍 Explore Backup and DR **NEW**
Back up your VMs and set up disaster recovery

📄 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 in

🔄 Load balance between VMs [↗](#)
Set up Load Balancing for your applications as your traffic and users grow

Virtual machines

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed use discounts

Reservations

Migrate to Virtual Machin...

Storage

Disks

Snapshots

Images

ssh.cloud.google.com/v2/ssh/projects/myproject-mis4596/zones/us-central1-f/instances/kali-2?authuser=0&hl=en_US&projectNumber=...

ssh.cloud.google.com/v2/ssh/projects/myproject-mis4596/zones/us-central1-f/instances/kali-2?authuser=0&hl=en_US&projectNu...

Establishing connection to SSH server...

Authorize

Allow SSH-in-browser to connect to VMs.

Authorize

Cancel

| External IP | Connect |
|----------------|---------|
| | SSH |
| 118.245 (nic0) | SSH |

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

```
ssh.cloud.google.com/v2/ssh/projects/myproject-mis4596/zones/us-central1-f/instances/kali-2?authuser=0&hl=en_US&projectNumber=...  
ssh.cloud.google.com/v2/ssh/projects/myproject-mis4596/zones/us-central1-f/instances/kali-2?authuser=0&hl=en_US&projectNu...  
SSH-in-browser UPLOAD FILE DOWNLOAD FILE  
Linux kali 5.10.0-kali7-amd64 #1 SMP Debian 5.10.28-1kali1 (2021-04-12) x86_64  
  
The programs included with the Kali GNU/Linux system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.  
  
Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent  
permitted by applicable law.  
┌─(Message from Kali developers)  
└─ We have kept /usr/bin/python pointing to Python 2 for backwards  
compatibility. Learn how to change this and avoid this message:  
⇒ https://www.kali.org/docs/general-use/python3-transition/  
┌─(Run: "touch ~/.hushlogin" to hide this message)  
└─ (profdavid49@kali) ~  
$ whoami  
profdavid49  
  
(profdavid49@kali) ~  
$ pwd  
/home/profdavid49  
  
(profdavid49@kali) ~  
$ ls  
  
(profdavid49@kali) ~  
$
```

| External IP | Connect |
|----------------|---------|
| | SSH ⌵ ⋮ |
| 118.245 (nic0) | SSH ⌵ ⋮ |

metrics like CPU

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



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Google Cloud

MyProject MIS4596

Search (/) for resources, docs, products, and more

Search



Compute Engine

VM instances

CREATE INSTANCE

IMPORT VM

REFRESH

INSTANCES

OBSERVABILITY

INSTANCE SCHEDULES

VM instances

Filter Enter property name or value

| <input type="checkbox"/> | Status | Name ↑ | Zone | Recommendations | In use by | Internal IP | External IP | Connect |
|--------------------------|--------|------------------------|---------------|-----------------|-----------|-------------------------------------|--|---------|
| <input type="checkbox"/> | ● | kali | us-central1-c | | | 10.128.0.2 (nic0) | | SSH ▾ ⋮ |
| <input type="checkbox"/> | ● | kali-2 | us-central1-f | | | 10.128.0.3 (nic0) | 34.27.118.245 (nic0) | SSH ▾ ⋮ |

Related actions

Explore Backup and DR **NEW**

View billing report

Monitor VMs

Explore

Start / Resume

Stop

Suspend



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Search

Storage



Compute Engine

VM instances

CREATE INSTANCE

IMPORT VM

REFRESH

INSTANCES

OBSERVABILITY

INSTANCE SCHEDULES

VM instances

Filter Enter property name or value

| <input type="checkbox"/> | Status | Name ↑ | Zone | Recommendations | In use by | Internal IP | External IP | Connect |
|--------------------------|--------|------------------------|---------------|-----------------|-----------|-------------------------------------|-------------|---------|
| <input type="checkbox"/> | ● | kali | us-central1-c | | | 10.128.0.2 (nic0) | | SSH ▾ ⋮ |
| <input type="checkbox"/> | ● | kali-2 | us-central1-f | | | 10.128.0.3 (nic0) | | SSH ▾ ⋮ |



Virtual machines



VM instances



Instance templates

Sole-tenant nodes

Machine images

TPUs

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Google Cloud

MyProject MIS4596

Search (/) for resources, docs, products, and more

Search

Compute Engine

VM instances

CREATE INSTANCE

IMPORT VM

REFRESH

INSTANCES

OBSERVABILITY

INSTANCE SCHEDULES

1 instance selected

START / RESUME

STOP

SUSPEND

RESET

DELETE

LABELS

PERMISSIONS

Filter Enter property name or value

| | Status | Name ↑ | Zone | Recommendations | In use by | Internal IP | External IP | Connect | |
|-------------------------------------|--------|------------------------|---------------|-----------------|-----------|-------------------|-------------|---------|---|
| <input checked="" type="checkbox"/> | ● | kali | us-central1-c | | | 10.128.0.2 (nic0) | | SSH ▾ | ⋮ |
| <input type="checkbox"/> | ● | kali-2 | us-central1-f | | | 10.128.0.3 (nic0) | | SSH ▾ | |

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Explore
View, search, instance logs

Load balance between VMs [↗](#)
Set up Load Balancing for your applications as your traffic and users grow

Start / Resume

Stop

Suspend

Reset

Delete

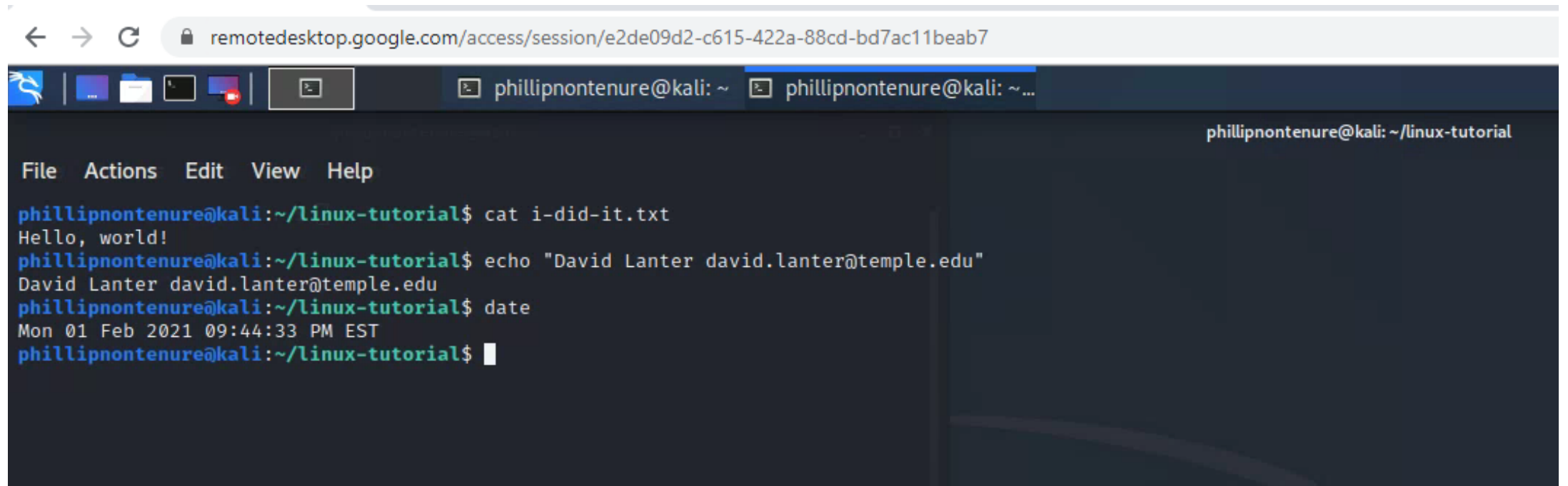
View network details

Create new machine image

View logs

View monitoring

Complete introduction to Linux tutorial



The screenshot shows a remote desktop session in a web browser. The address bar displays the URL: `remotedesktop.google.com/access/session/e2de09d2-c615-422a-88cd-bd7ac11beab7`. The desktop environment is Kali Linux, with a terminal window open. The terminal shows the following commands and outputs:

```
File Actions Edit View Help
phillipnontenure@kali:~/linux-tutorial$ cat i-did-it.txt
Hello, world!
phillipnontenure@kali:~/linux-tutorial$ echo "David Lanter david.lanter@temple.edu"
David Lanter david.lanter@temple.edu
phillipnontenure@kali:~/linux-tutorial$ date
Mon 01 Feb 2021 09:44:33 PM EST
phillipnontenure@kali:~/linux-tutorial$
```


Linux Management - IMPORTANT

- Shutdown your Kali computer machine when you are not using it
- Change your Kali root password
 - Everyone knows the default root password is: toor
 - CHANGE IT TO SOMETHING ELSE
 - Use a strong password: 8-10 characters long
 - Use upper case + lower case + numbers + symbols
 - Run the passwd command: “sudo passwd” without any arguments:
 - You will be prompted to enter your current password. If the password is correct, the command will ask you to enter and confirm the new password. Passwords are not shown on the screen when you enter them. The next time you log in to your system, use the new password.

<https://www.hostinger.com/tutorials/how-to-change-password-in-linux/>

Some useful Linux commands

File Commands

ls - directory listing
ls -al - formatted listing with hidden files
cd *dir* - change directory to *dir*
cd - change to home
pwd - show current directory
mkdir *dir* - create a directory *dir*
rm *file* - delete *file*
rm -r *dir* - delete directory *dir*
rm -f *file* - force remove *file*
rm -rf *dir** - force remove directory *dir* *
cp *file1 file2* - copy *file1* to *file2*
cp -r *dir1 dir2* - copy *dir1* to *dir2*; create *dir2* if it doesn't exist
mv *file1 file2* - rename or move *file1* to *file2*
if *file2* is an existing directory, moves *file1* into directory *file2*
ln -s *file link* - create symbolic link *link* to *file*
touch *file* - create or update *file*
cat > *file* - places standard input into *file*
more *file* - output the contents of *file*
head *file* - output the first 10 lines of *file*
tail *file* - output the last 10 lines of *file*
tail -f *file* - output the contents of *file* as it grows, starting with the last 10 lines

System Info

date - show the current date and time
cal - show this month's calendar
uptime - show current uptime
w - display who is online
whoami - who you are logged in as
finger *user* - display information about *user*
uname -a - show kernel information
cat /proc/cpuinfo - cpu information
cat /proc/meminfo - memory information
man *command* - show the manual for *command*
df - show disk usage
du - show directory space usage
free - show memory and swap usage
whereis *app* - show possible locations of *app*
which *app* - show which *app* will be run by default

Shortcuts

Ctrl+C - halts the current command
Ctrl+Z - stops the current command, resume with **fg** in the foreground or **bg** in the background
Ctrl+D - log out of current session, similar to **exit**
Ctrl+W - erases one word in the current line
Ctrl+U - erases the whole line
Ctrl+R - type to bring up a recent command
!! - repeats the last command
exit - log out of current session

Agenda

- ✓ Short history of computers, Unix and Linux
- ✓ Introduction to the Google Cloud Platform
- ✓ Next step... Linux tutorial
- ✓ Remember: Milestone 1 project!