



Deploying IPFS Infrastructure

How to Deploy Your Very Own Node in the Cloud

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Engineer at Protocol Labs



Before
We Start...
Have You Loaded
the Course Github Page?





ipfs camp



All



News



Images



Videos



Maps



More

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Tools

About 203,000 results (0.49 seconds)

IPFS Camp, June 27-30 2019

<https://camp.ipfs.io/> ▼

IPFS Camp is a 3 day hacker retreat designed for the builders of the Distributed Web. Join the core developers for a hands on experience packed with ...

[Schedule](#) · [Location](#) · [FAQ](#) · [Conduct](#)

Announcing, the 1st ever IPFS Camp, Jun 27-30 - IPFS Blog

<https://blog.ipfs.io/72-ann-ipfs-camp/> ▼

Feb 28, 2019 - The IPFS Project is thrilled to invite you to a new event we've been baking for the IPFS Community, the IPFS Camp . A three day hacker ...

ipfs/camp - GitHub

<https://github.com/ipfs/camp> ▼

Contribute to ipfs/camp development by creating an account on GitHub.

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Dismiss

GitHub is home to over 36 million developers working together to host and review code, manage projects, and build software together.

Sign up

https://camp.ipfs.io

130 commits

14 branches

0 releases


24 contributors

Branch: master

New pull request

Find File

Clone or download

 momack2 name (#50)	Latest commit 95e6855 2 hours ago
CORE_AND_ELECTIVE_COURSES	name (#50) 2 hours ago
DEEP_DIVES	Deep dive 11-private-content-on-ipfs (#42) 9 hours ago
LIGHTNING_TALKS	Update README.md 3 hours ago
LIGHTNING_TALKS	Create README.md 3 hours ago
POSTER_PROJECTS	at IPFS Camp, everyone is a contributor (a/ 2 days ago
QUIET_ROOM	Quiet room and art proposal (#41) yesterday
SCI-FL_FAIR	clarify mission further yesterday
UNCONF	docs: update UNCONF description last month
img	prep session folders last month
README.md	Update README.md 3 hours ago



<> Code

🔔 Issues 3

🔗 Pull requests 7

▶ Actions

🛡 Security

📊 Insights

Branch: master ▾

camp / CORE_AND_ELECTIVE_COURSES /

Create new file

Upload files

Find file

History



obo20 Update README.md

Latest commit d5cb21d now

..

📁 CORE_COURSE_A	Core Course A - outline (#4)	9 days ago
📁 CORE_COURSE_B	docs(courseb): replace raulk with bigs (#10)	8 days ago
📁 CORE_COURSE_C	Add Core Course C description (#35)	3 days ago
📁 CORE_COURSE_D	Description and summary for core course D	3 days ago
📁 ELECTIVE_COURSE_A	Add Elective Course A description (#21)	4 days ago
📁 ELECTIVE_COURSE_B	Cluster Elective Course (#45)	12 hours ago
📁 ELECTIVE_COURSE_C	Placeholder for Jérôme's course (#23)	6 days ago
📁 ELECTIVE_COURSE_D	WIP: Initial course information (#14)	8 days ago
📁 ELECTIVE_COURSE_E	Update README.md	now
📁 ELECTIVE_COURSE_F	Update README.md	yesterday
📁 ELECTIVE_COURSE_G	Update README.md	8 days ago
📁 ELECTIVE_COURSE_H	Add title and description for Elective H (#19)	8 days ago
📄 GUIDELINES_AND_REQUIREMENTS.md	docs: import guidelines & requirements to the camp repo	5 days ago
📄 README.md	Add Core Course C description (#35)	3 days ago

obo20 Update README.md Latest commit d5cb21d 44 seconds ago

README.md Update README.md 44 seconds ago

README.md

Elective E Deploying IPFS Infrastructure

Take your IPFS game to the next level by learning how to deploy and manage your very own IPFS node in the cloud.

Trainers

Matt Ober



@obo20

Michael Burns



@mburns

Jakub Sztandera



@kubuxu

IPFS Node Roles

The Server

- Always online
- Focused on providing content
- Typically hosted in data centers

The Client

- May come online / offline
- Focused on consuming content
- Typically a consumer device

IPFS Node Roles

The Server

- Always online
- Focused on providing content
- Typically hosted in data centers

Cloud Providers



DigitalOcean



Google Cloud



Azure

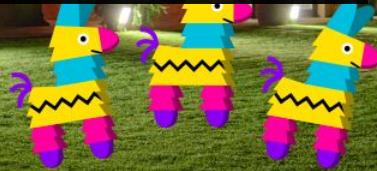
Cloud Providers



DigitalOcean

Signing Up

<https://do.co/pinata>



1 Confirm email

2 Verification

3 Project Goals

You've been referred to DigitalOcean

As soon as you've added your card, we'll credit your account with \$50. Unused credit expires after 30 days.

Billing Info

Add a payment method to your account. The \$50 credit will be applied immediately after the card is added. You will not be charged until all of the credit is used or it expires. [Learn more about billing.](#)

Credit / Debit Card PayPal

ENTER CARD DETAILS

BILLING ADDRESS

* All Fields Required

You may see a temporary authorization hold on your card, which your bank should release soon.

Don't worry.

Your card won't be charged.

Just be sure to destroy your node when you're done with this course.

Welcome, Matt Ober!

To begin, let's create a new project. Projects help you organize your resources by environment, workload, client - however you or your team like to work.

Note: You can change the name, redefine the purpose, and move resources between projects as your needs change.

Create your first project

Enter project name
My Awesome Project ✓

What is your project for?

This information will help us improve the projects experience, based on what you're building.

Just trying out DigitalOcean ⌵

Tell us which tools and technologies you plan to use on DigitalOcean

CONFIGURATION MANAGEMENT

Ansible
 Chef
 Docker
 Kubernetes
 Puppet

DEPLOYMENT

Dokku
 Gitlab
 Jenkins

DEV TOOLS

Django
 Elasticsearch
 Github
 Go

HAProxy
 Hadoop
 Java
 Kafka

MEAN
 MongoDB
 MySQL
 Nginx

NodeJS
 PHP
 PhpMyAdmin
 PostgreSQL

Python
 RabbitMQ
 React
 Redis

Ruby
 Slack
 Tomcat

MONITORING

Grafana
 Nagios
 Statsd

OTHER CLOUD PROVIDERS

AWS
 Azure
 GCP
 Heroku

PUBLISHING

Discourse
 Ghost
 WordPress

Do you plan to use key technologies or services not listed above?

Enter any other technologies you plan to use

How many people are in your organization?



Start

Creating Your Machine (Droplet)





PROJECTS

My Awesome P...

+ New Project

MANAGE

Droplets

Kubernetes

Volumes

Databases

Spaces

Images

Networking

Monitoring

API

DISCOVER

Marketplace

ACCOUNT

Profile

Billing

Security

Referrals

Search by Droplet name or IP (Cmd+B)

Create



USAGE
\$0.00



My Awesome Project DEFAULT

Just trying out DigitalOcean

→ Move Resources

Resources

Activity

Settings



This is your first project

Create new projects and organize your resources to suit your workflow. [Learn more](#)

Create a Droplet



New Droplet





Start with a scalable virtual server

Create something new

Learning materials

Choose an image ?

[Distributions](#) [Container distributions](#) [Marketplace](#) [Snapshots](#) [Custom images](#)

 Ubuntu 18.04 x64 ▼	 FreeBSD Select version ▼	 Fedora Select version ▼	 Debian Select version ▼	 CentOS Select version ▼
---	---	--	--	--

Choose a plan

STARTER	PERFORMANCE	
Standard	General Purpose NEW	CPU Optimized

Standard virtual machines with a mix of memory and compute resources. Best for small projects that can handle variable levels of CPU performance, like blogs, web apps and dev/test environments.

\$5 /mo \$0.007/hour 1 GB / 1 CPU 25 GB SSD disk 1000 GB transfer	\$10 /mo \$0.015/hour 2 GB / 1 CPU 50 GB SSD disk 2 TB transfer	\$15 /mo \$0.022/hour 3 GB / 1 CPU 60 GB SSD disk 3 TB transfer	\$15 /mo \$0.022/hour 2 GB / 2 CPUs 60 GB SSD disk 3 TB transfer	\$15 /mo \$0.022/hour 1 GB / 3 CPUs 60 GB SSD disk 3 TB transfer	\$20 /mo \$0.030/hour 4 GB / 2 CPUs 80 GB SSD disk 4 TB transfer →
--	--	--	---	---	--



[Show all plans](#)

Add backups

Enable automatic weekly backups RECOMMENDED

When you enable [backups](#), a system-level disk image of the entire Droplet is taken once a week and saved for four weeks. In the event of problems, you can [create a new Droplet or restore](#) from one of these images. Backups cost 20% of the Droplet price.

\$3.00/mo


Add block storage

Currently only available in AMS3, BLR1, FRA1, LON1, NYC1, NYC3, SFO2, SGP1 and TOR1.

Block storage lets you add independent storage volumes that can be accessed like local disk and moved from one Droplet to another within the same region.

Add Volume

Choose a datacenter region

 New York 1 2 3	 San Francisco 1 2	 Amsterdam 2 3	 Singapore 1	 London 1	 Frankfurt 1
 Toronto 1	 Bangalore 1				

Select additional options ?

Private networking

IPv6

User data

Monitoring



SSH Setup

```
>  
_
```



If you already have a key ...
just wait

>
_

Creating your SSH key with OpenSSH

(Just wait if you already have a key)

Creating your SSH key with OpenSSH

1. Open up your terminal
2. Type in `ssh-keygen`
3. Hit enter to accept the recommended default path. *DO NOT CHOOSE TO OVERWRITE IF A KEY ALREADY EXISTS*
4. Optionally provide a password to require each time you use your key or just hit enter twice to avoid requiring a password

A dark gray rounded square icon representing a terminal window, containing a white prompt character consisting of a greater-than sign followed by an underscore (>_).

Copying your SSH key

Copying your SSH key

To copy your SSH Key, do either of these:

- Type: `cat ~/.ssh/id_rsa.pub`
- Travel to your public key with: `cd ~/.ssh/id_rsa.pub` and open the file to copy the contents

(The above instructions are assuming your key is saved in the default location)



Click on “New SSH Key” and paste your public key

×

New SSH key

Paste a copy of your **public key** in the space below. It should end in `.pub`.
[Learn more](#). This does not add an SSH key to your existing Droplets. To do so, [follow the instructions here](#).

SSH key content ✓

My SSH Key Contents

Name ✓

My-Awesome-SSH-Key

Add SSH Key

Add your SSH keys ?

New SSH Key



test-machine

Finalize and create

How many Droplets?

Deploy multiple Droplets with the same [configuration](#).

—	1 Droplet	+
---	-----------	---


Select project

Select an existing project for this Droplet/s.

Choose a hostname

Give your Droplets an identifying name you will remember them by. Your Droplet name can only contain alphanumeric characters, dashes, and periods.

Add Tags

 Matt Ober ▼

Create

Success



Test Guide Project DEFAULT

Website or blog

→ Move Resources

Resources Activity Settings

DROPLETS (1)

  **ExampleNode**

104.248.51.184



Connecting to your droplet

Connecting to your droplet

In your terminal type: `ssh root@your_droplet_ip`

(You'll need to type `yes` when ssh-ing into your node for the first time)

You should now be connected to your droplet!

A dark square icon with a white border, containing a white prompt character consisting of a greater-than sign followed by an underscore and a space (>_).

>_

Updating your droplet

Updating your droplet

Now, in your terminal type:

1. `apt-get update`

2. `apt-get upgrade`

2.1. If you get a pink screen asking whether to automatically restart, hit `LEFT ARROW` and then `ENTER`

2.2. If you get another pink screen asking for a confirmation, hit `ENTER`

3. `apt autoremove`

4. `shutdown -r 0`

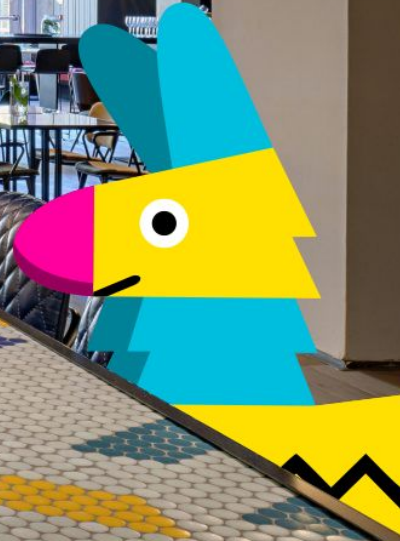
Your droplet should now be updated and rebooted.



Optional Step: Creating a non-root user



Securing Your Droplet





Search by Droplet name or IP (Cmd+B)

Create ▾



USAGE
\$0.00



PROJECTS

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Droplets

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Droplets

Search by Droplet name

Name	IP Address	Created ▴	Tags
 IPFS-Camp-Guide 2 GB / 60 GB Disk / FRA1 - Ubuntu 18.04 x64	165.22.72.61	18 minutes ago	More ▾

Click "Networking"



Networking

Click "Firewalls"

[Domains](#) [Floating IPs](#) [Load Balancers](#) [Firewalls](#) [Firewalls](#)



Looks like there are no domains here.

You can add one easily, though. Enter a domain below and start managing your DNS with DigitalOcean.

*



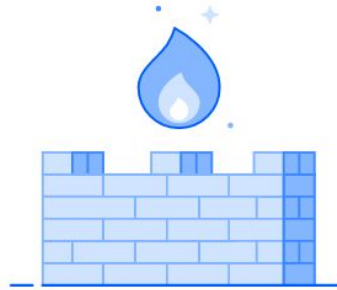
My Awesome Project



Add Domain

Networking

[Domains](#) [Floating IPs](#) [Load Balancers](#) [Firewalls](#) [PTR records](#)



Click "Create Firewall"

Firewalls

Firewalls allow you to easily secure your infrastructure by explicitly defining which type of traffic is allowed to reach it. Use tags to organize your infrastructure and apply Firewall rules to multiple resources.

Create Firewall

Name

Name
ExampleFirewall ✓

Inbound Rules

Set the Firewall rules for incoming traffic. Only the specified ports will accept inbound connections. All other traffic will be dropped.

Type	Protocol	Port Range	Sources	
SSH	TCP	22	All IPv4 All IPv6	Delete
Custom	TCP	Ports 4001 ?	All IPv4 All IPv6	Delete
Custom	TCP	Ports 8080 ?	All IPv4 All IPv6	Delete
New rule Custom				

Outbound Rules

Set the Firewall rules for outbound traffic. Outbound traffic will only be allowed to the specified ports. All other traffic will be blocked.

Type	Protocol	Port Range	Destinations	
ICMP	ICMP		All IPv4 All IPv6	Delete
All TCP	TCP	All ports	All IPv4 All IPv6	Delete
All UDP	UDP	All ports	All IPv4 All IPv6	Delete
New rule				

Apply to Droplets

Select Droplets to apply your Firewall rules to.

🔍 IPFS-Camp-Guide Search for a Droplet or a tag

Create Firewall

Installing IPFS



IPFS Installation

Installing IPFS-update

In your terminal:

1. Download ipfs-update with: `curl -O https://dist.ipfs.io/ipfs-update/v1.5.2/ipfs-update_v1.5.2_linux-amd64.tar.gz`
2. Unzip it with: `tar -xzf ipfs-update_v1.5.2_linux-amd64.tar.gz`
3. Go into the ipfs-update folder with: `cd ipfs-update`
4. Install ipfs-update with: `./install.sh`



IPFS Installation

Use IPFS-update to install IPFS

1. Install the latest ipfs version with: `ipfs-update install latest`
2. Initialize ipfs with `ipfs init --profile server`
3. Check that IPFS was installed with: `ipfs daemon`



IPFS Installation

```
root@IPFS-CAMP-GUIDE-2:~/ipfs-update# ipfs init --profile server
initializing IPFS node at /root/.ipfs
generating 2048-bit RSA keypair...done
peer identity: QmYRYdTyisCA4JGbEG4AtNS15k8FKgKAYCdrbyJEpeD8dE
to get started, enter:

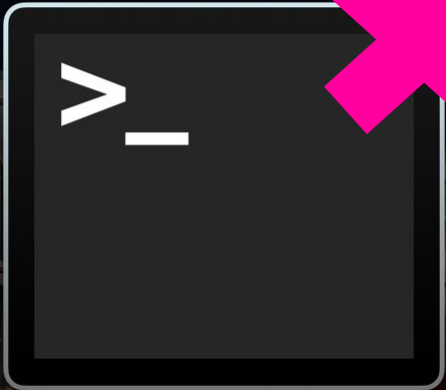
    ipfs cat /ipfs/QmS4ustL54uo8FzR9455qaxZwuM1UhyvMcX9Ba8NH4uVv/readme

root@IPFS-CAMP-GUIDE-2:~/ipfs-update# ipfs daemon
Initializing daemon...
go-ipfs version: 0.4.21-
Repo version: 7
System version: amd64/linux
Golang version: go1.12.5
Swarm listening on /ip4/10.19.0.6/tcp/4001
Swarm listening on /ip4/127.0.0.1/tcp/4001
Swarm listening on /ip4/165.22.72.61/tcp/4001
Swarm listening on /ip6/2a03:b0c0:3:e0::1be:a001/tcp/4001
Swarm listening on /ip6>::1/tcp/4001
Swarm listening on /p2p-circuit
Swarm announcing /ip4/127.0.0.1/tcp/4001
Swarm announcing /ip4/165.22.72.61/tcp/4001
Swarm announcing /ip6/2a03:b0c0:3:e0::1be:a001/tcp/4001
Swarm announcing /ip6>::1/tcp/4001
API server listening on /ip4/127.0.0.1/tcp/5001
WebUI: http://127.0.0.1:5001/webui
Gateway (readonly) server listening on /ip4/127.0.0.1/tcp/8080
Daemon is ready
```



Almost There!





Keeping IPFS Running

Keeping IPFS running

Create a system service

1. Create a system service with: `nano /etc/systemd/system/ipfs.service`
2. Enter the following instructions:

```
[Unit]
Description=IPFS Daemon
[Service]
ExecStart=/usr/local/bin/ipfs daemon --enable-gc
Restart=always
Environment="IPFS_PATH=/root/.ipfs"
[Install]
WantedBy=multi-user.target
```

3. Save your new service by hitting `CTRL + X`, then `y`, then `ENTER`



Keeping IPFS Running...*Continued*

Enable the system service

1. Reload your system with: `systemctl daemon-reload`
2. Enable your new service with: `systemctl enable ipfs`
3. Start your new service with: `systemctl start ipfs`
4. Test that this succeeded with: `systemctl status ipfs`



Success

```
root@IPFS-Camp-Guide:~# systemctl status ipfs
● ipfs.service - IPFS Daemon
   Loaded: loaded (/etc/systemd/system/ipfs.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2019-06-06 02:22:16 UTC; 9min ago
 Main PID: 3971 (ipfs)
   Tasks: 11 (limit: 2361)
   CGroup: /system.slice/ipfs.service
           └─3971 /root/go/bin/ipfs daemon --enable-gc

Jun 06 02:22:17 IPFS-Camp-Guide ipfs[3971]: Swarm listening on /ip6/::1/tcp/4001
Jun 06 02:22:17 IPFS-Camp-Guide ipfs[3971]: Swarm listening on /p2p-circuit
Jun 06 02:22:17 IPFS-Camp-Guide ipfs[3971]: Swarm announcing /ip4/127.0.0.1/tcp/4001
Jun 06 02:22:17 IPFS-Camp-Guide ipfs[3971]: Swarm announcing /ip4/68.183.151.54/tcp/4001
Jun 06 02:22:17 IPFS-Camp-Guide ipfs[3971]: Swarm announcing /ip6/2604:a880:800:c1::16b:a001/tcp/4001
Jun 06 02:22:17 IPFS-Camp-Guide ipfs[3971]: Swarm announcing /ip6/::1/tcp/4001
Jun 06 02:22:17 IPFS-Camp-Guide ipfs[3971]: API server listening on /ip4/127.0.0.1/tcp/5001
Jun 06 02:22:17 IPFS-Camp-Guide ipfs[3971]: WebUI: http://127.0.0.1:5001/webui
Jun 06 02:22:17 IPFS-Camp-Guide ipfs[3971]: Gateway (readonly) server listening on /ip4/127.0.0.1/tcp/8080
Jun 06 02:22:17 IPFS-Camp-Guide ipfs[3971]: Daemon is ready
```





EXIT

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EXIT

A vibrant, stylized cartoon rabbit is the central focus. It has a yellow body, a pink nose, and large, upright cyan ears. The rabbit is sitting inside a black, quilted hammock that is suspended between two black metal stands on a green lawn. The background is a bright, sunny outdoor setting with trees and a colorful, abstract structure in the distance. A black rectangular banner with white text is overlaid across the middle of the image.

Let's try pinning something

A colorful bird sculpture is mounted on a trampoline in a park. The bird has a yellow body, a pink beak, and teal wings. The trampoline is on a grassy area with trees and a colorful building in the background.

Pinning content

1. In your terminal type: `ipfs pin add -r --progress QmWcLKHwqrRB95zQnb4vX8RRgoGsVm5YAUHyZyiAw4mCMQ`

A vibrant, stylized cartoon rabbit is the central focus. It has a yellow body, a pink nose, and large, upright blue ears. The rabbit is positioned as if sitting on a black, quilted hammock that is suspended from a black metal stand. The stand is set on a lush green lawn. In the background, there are trees and a colorful, abstract structure that looks like a play area or a modern building. A semi-transparent black banner with white text is overlaid across the middle of the image.

Let's set up our gateway and view it

Viewing that content with your own gateway

1. In your terminal expose your gateway with: `ipfs config Addresses.Gateway /ip4/0.0.0.0/tcp/8080`
2. Now restart ipfs with: `systemctl restart ipfs`
3. Now in your browser go to
<http://yourDropletIp:8080/ipfs/QmWcLKHWqrRB95zQnb4vX8RRgoGsVm5YAUHyZyiAw4mCMQ>



Avoid Being Billed

Destroying Your Droplet

- PROJECTS
 - My Awesome Pr...
 - + New Project
- MANAGE
 - Droplets**
 - Kubernetes
 - Volumes
 - Databases
 - Spaces
 - Images
 - Networking
 - Monitoring
 - API
- DISCOVER
 - Marketplace
- ACCOUNT
 - Profile
 - Billing
 - Security
 - Referrals

Search by Droplet name or IP (Cmd+B)

IPFS-Camp-Guide

in My Awesome Project / 2 GB Memory / 60 GB Disk / FRA1 - Ubuntu 18.04 x64

ON

ipv4: 165.22.72.61 ipv6: 2a03:b0c0:3:e0::1be:a001 Private IP: [Enable now](#) Floating IP: [Enable now](#) Console: [📄](#)

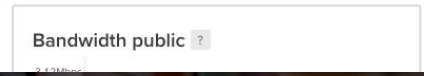
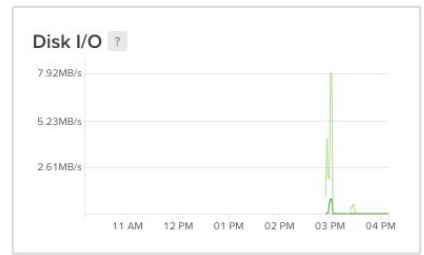
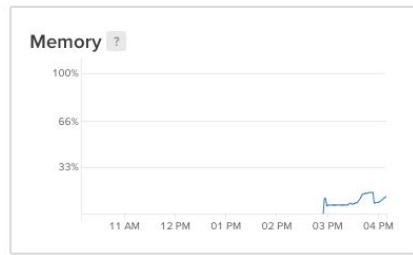
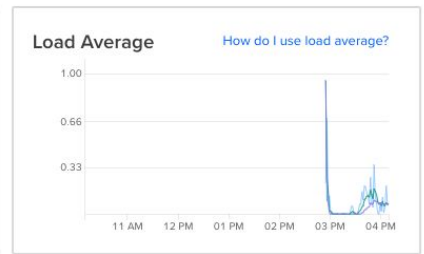
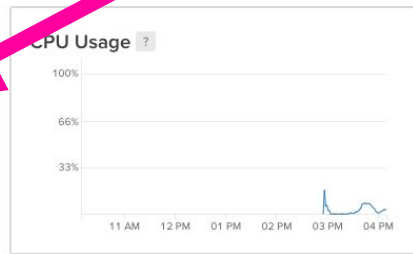
Graphs

- Access
- Power
- Volumes
- Resize
- Networking
- Backups
- Snapshots
- Kernel
- History
- Destroy
- Tags
- Recovery

We value your feedback. Tell us about your experience with new metrics agent so far. [Share feedback](#) ✕

Last updated just now. [Create alert policy](#)

Select Period
6 hours





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Search by Droplet name or IP (Cmd+B)

Create



USAGE
\$0.00



IPFS-Camp-Guide

in My Awesome Project / 2 GB Memory / 60 GB Disk / FRA1 - Ubuntu 18.04 x64

ON

ipv4: 165.22.72.61

ipv6: 2a03:b0c0:3:e0::1be:a001

Private IP: Enable now

Floating IP: Enable now

Console:

Graphs

Access

Power

Volumes

Resize

Networking

Backups

Snapshots

Kernel

History

Destroy

Tags

Recovery

Destroy Droplet

This is irreversible. We will destroy your Droplet and all associated backups. All Droplet data will be scrubbed and irretrievable.

Destroy

Rebuild Droplet

This will rebuild your Droplet using the image specified and its original configuration parameters. The rebuild process will destroy all data currently on this Droplet, so back up anything you want to keep.

If you select an image with a different operating system than this Droplet, you can break your configuration. Proceed with caution.

Select an image

Rebuild

What Next?

B·ARTY



Choose Your Own Adventure

- Tips and tricks for your node's settings
- IPFS infrastructure Q&A



Tips & Tricks

- To enable local network discovery: set up the “Discovery” settings
 - MDNS: enabled means that nodes on the same network can find each other
- Understand the “Routing” settings
 - Type: dht means the node will serve content to the network
 - Type: dhtclient means the client will only consume content from the network

Tips & Tricks

- Increase your node's discoverability with ConnMGR settings
 - **HighWater**: The max # of concurrent connections your node will maintain to other nodes
 - **LowWater**: The minimum # of concurrent connections your node will maintain
- NAT is annoying to deal with, but not impossible!
 - **EnableAutoRelay**: Allows nodes behind firewalls discover their NAT situation
 - **EnableAutoNATService**: Enables a client behind a firewall to discover their NAT situation