
# App Platform

## Step by Step

Building a simple but complete application with Node.js

https://www.digitalocean.com

# What we are going to do today?

- Develop the **front-end**
  - Deployed a static site
- Implement a **back-end API**
  - Provision a node backed
- Add persistence with a **database**
  - Provisioning a Postgresql Databse
- Develop freely with continuous updates!

# Configuration

# Preparation

## Register for a free account

- You will get access to Atlantis

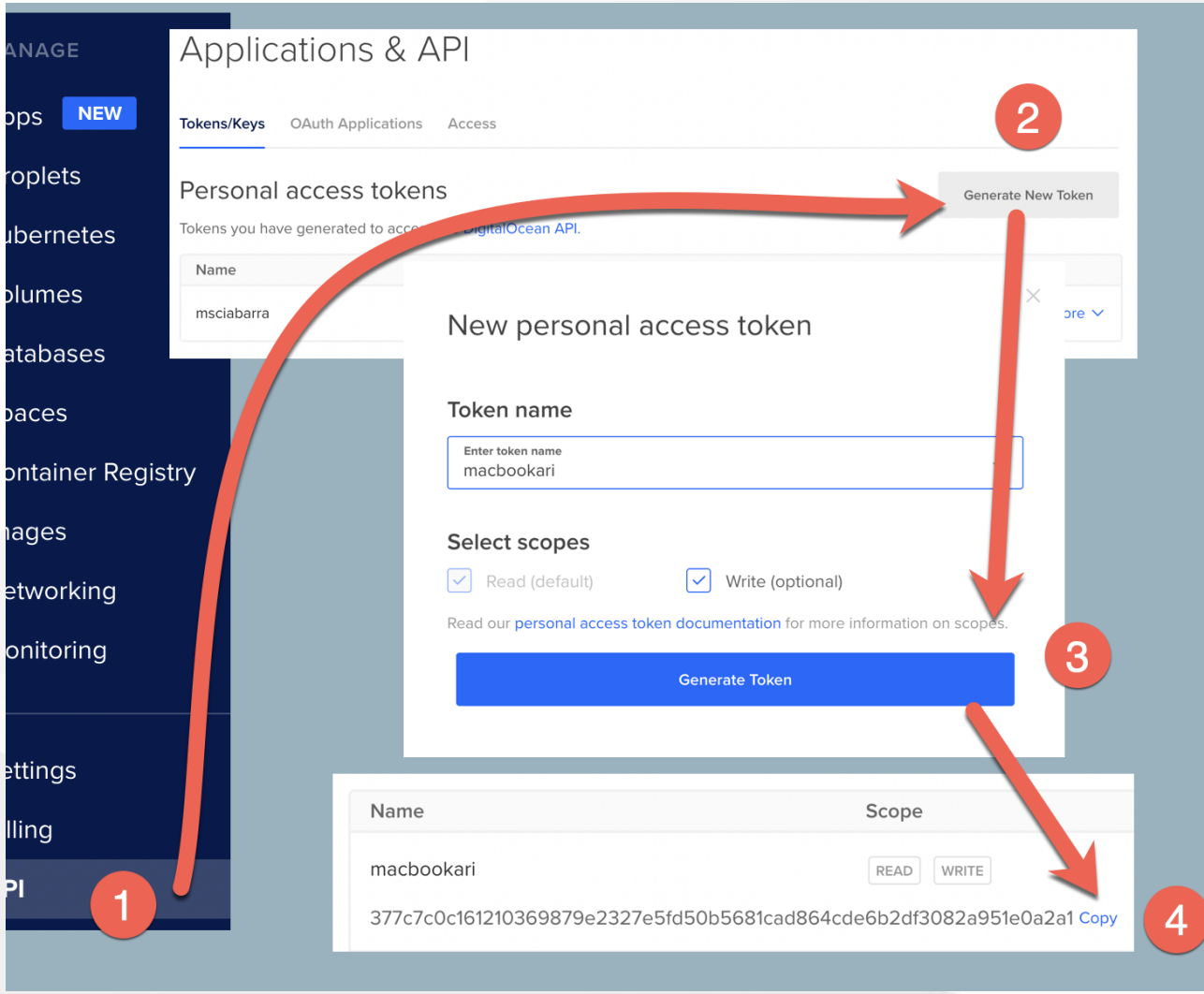
## Install the cli `doctl`

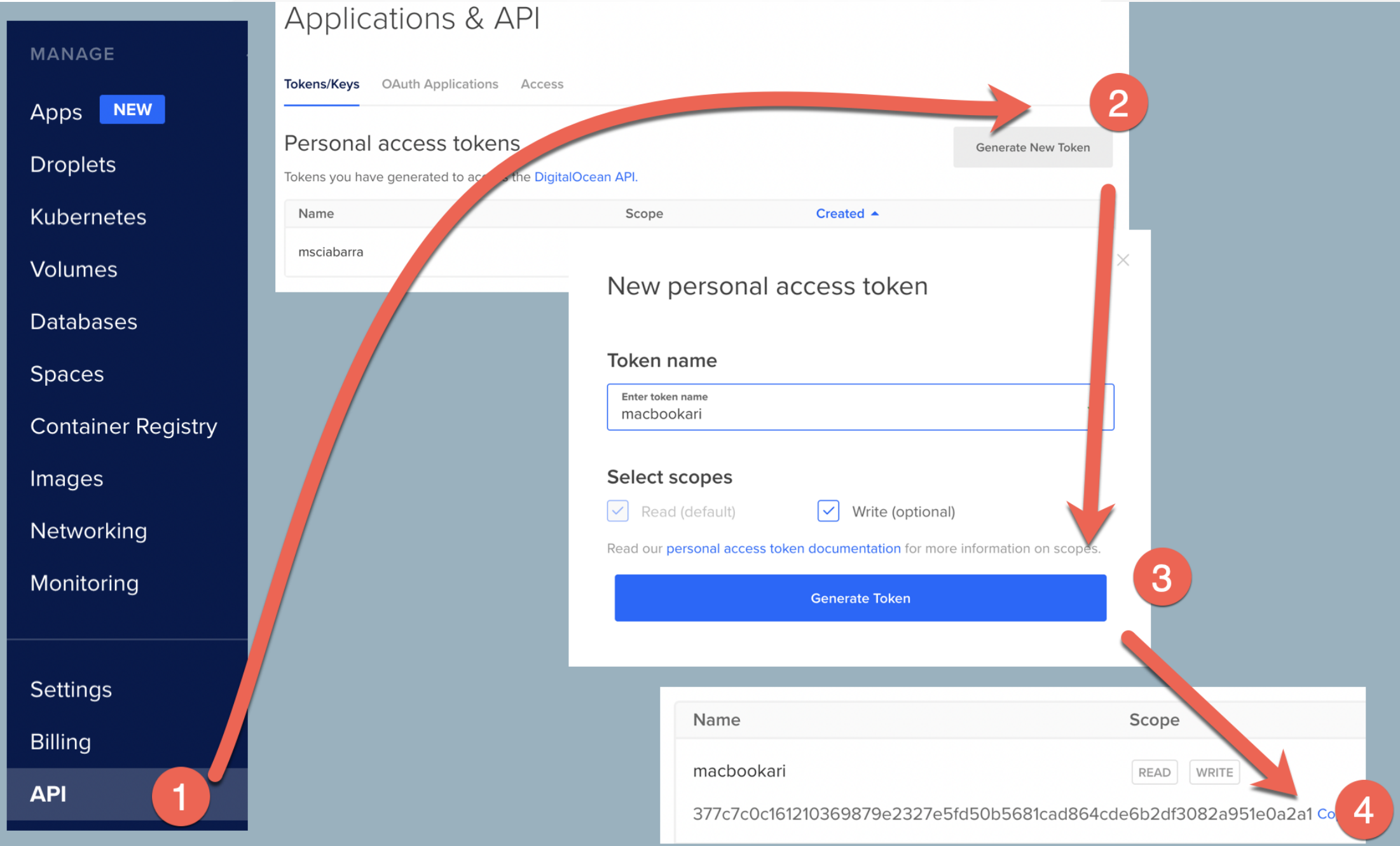
https://docs.digitalocean.com/reference/doctl/how-to/install/

- Available for Windows, Mac and Linux

# Get your token

- Install the `doctl` cli
- Click on **API** on Menu
- Click on **Generate New Token**
- Click on **Generate Token**
- Click on **Copy**
- Type `doctl auth init` and paste




MANAGE
Apps
NEW
Droplets
Kubernetes
Volumes
Databases
Spaces
Container Registry
Images
Networking
Monitoring
Settings
Billing
API
1
Applications & API
Tokens/Keys
OAuth Applications
Access
Personal access tokens
Generate New Token
2
Tokens you have generated to ac
the DigitalOcean API.
Name
Scope
Created
msciabarra
New personal access token
Token name
Enter token name
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Select scopes
Read (default)
Write (optional)
Read our personal access token documentation for more information on scopes.
Generate Token
3
Name
Scope
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READ
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377c7c0c161210369879e2327e5fd50b5681cad864cde6b2df3082a951e0a2a1
4

# Frontend

# Creating a frontend

- An example using Svelte

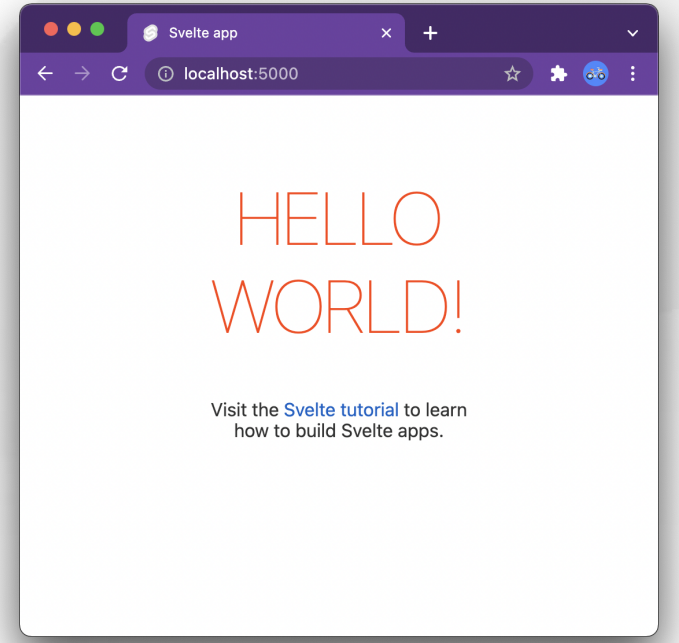
```
npx degit
sveltejs/template frontend
```

- Install it

```
cd frontend && npm install
```

- Run in development mode

```
npm run dev
```



# Concepts of App Platform / 1

- You deployment is the `.do/app.yaml`
- It includes lots of components:
  - static sites
  - applications in multiple languages
  - databases
  - and much more...

# Concepts of App Platform / 2

- The YAML describes the complete cycle:
- **1** Pulling from repositoryes
- **2** Building applications
- **3** Exposing to the internet

# Deployment

- Deploy with: `doctl app create --spec .do/app.yaml`

# Deployment: `.do/app.yaml`

```yaml
name: tutorial-app-platform
static_sites:
- name: frontend
  # 1 pulling from repositories
  github:
    repo: sciabarrado/tutorial-app-platform
    branch: main
    deploy_on_push: true
  # 2 building applications
  build_command: npm run build
  source_dir: frontend
  # 3 exposing to the internet
  routes:
  - path: /
```

# Exercise: deploy frontend

```
# creating the frontend
npx degit sveltejs/template frontend
cd frontend && npm install
npm run dev
# deploying the frontend
mkdir .do
cp src/1-app.yaml .do/app.yaml
doctl app create --spec .do/app.yaml
# monitoring
ID=$(doctl app list | awk '/tutorial-app-platform/ { print $1}')
echo $ID
doctl app logs $ID
```

# Backend

# Let's build our backend

- We are going to use **Node.js**
  - you can use also out of the box Python, PHP, Golang, Ruby
  - You can also use "*whatever*" thanks to Dockerfile
    - you need a bit more knowledge here
- Builds are automated thanks to "buildpack"
  - they can build your code *automagicallly* in many common cases

# Simple Backend Code `node.js`

```
const express = require('express')
const app = express()
const port = 8080

app.get('/', (req, res) => {
  res.send('Hello World!')
})

app.listen(port, () => {
  console.log(`App listening at http://localhost:${port}`)
})
```

# Creating the backend

```
# a new directory for backend
mkdir backend
cd backend
# mandatory initializations
npm -y init
npm install --save express
# using our examples here
cp ../src/2-index.js index.js
node index.js
```

# Deploying the backed with `app.yaml``

- Adding a `services` section
- same steps as before:
  - **1** pull
  - **2** build (automated)
  - **3** expose to interned
- Additional step:
  - **4** run your code

# Backend deployment

```
services:
- name: backend
  # 1 pull
  github:
    repo: sciabarrado/tutorial-app-platform
    branch: main
    deploy_on_push: true
  source_dir: backend
  # 2 build is autodetected
  # 3 expose to interned
  routes:
  - path: /api
  # 4 run your code
  run_command: node index.js
```

# Exercise: backend

```
# new configuration
cd ..
cp src/2-app.yaml .do/app.yaml
# update
ID=$(doctl app list | awk '/tutorial-app-platform/ { print $1}')
echo $ID
doctl app update $ID --spec .do/app.yaml
```

# Database

# What you need to know about the database

- It is automated provisioned:
  - just add it to the `app.yaml`
- Available:
  - SQL: `postgresql`, `mysql`
  - NoSQL: `redis`, `mongodb`
- You need to use environment variables to connect to it

# Environment variabiles used with PostgreSQL

- `PGHOST`, `PGPORT`
  - hostname and port of the database
- `PGUSER`, `PGPASSWORD`
  - username and password
- `PGDATABASE`, `PGSSLMODE`
  - database name
  - *important* you may need to set SSL mode in certain cases

# Exercise: create database locally

```
# create the user
psql postgres -U postgres
create user demo with password 'demo';
create database localdb with owner = 'demo';
quit
# configure the environment variables
export PGHOST=localhost
export PGPORT=5432
export PGDATABASE=localdb
export PGUSER=demo
export PGPASSWORD=demo
# check the connection
psql -h $PGHOST -p $PGPORT -U $PGUSER $PGDATABASE
```

# Connect to database with node

```
# install driver
cd backend
npm install pg --save
node
# test database connection
const { Client } = require('pg')
const client = new Client()
await client.connect()
let create = `
CREATE TABLE IF NOT EXISTS guestbook(
   id SERIAL PRIMARY KEY,
   message TEXT)`
const res = await client.query(create)
```

# Connecting to the database

```
const { Client } = require('pg')


function start() {
  console.log("connecting to database")
  let client = new Client()
  client.connect()
    .then(() => init(client))
    .catch((err) => {
      console.log(err)
      setTimeout(start, 2000)
    })
}
```

# Initializing the database

```
let create = `
CREATE TABLE IF NOT EXISTS guestbook(
   id SERIAL PRIMARY KEY,
   message TEXT
)`

function init(client) {
  client.query(create)
    .then(() => app.listen(port))
    .then(() => console.log(`App listening a at ${port}`))
    .catch(console.log)
}
```

# Provisioning a database

```
databases:
- name: db
  engine: PG
  version: "12"
```

- Development database
  - do not use in production

# Connecting to the database

```
# add parameters to connect to database
envs:
  - name: PGHOST
    value: ${db.HOSTNAME}
  - name: PGPORT
    scope: RUN_TIME
    value: ${db.PORT}
  - name: PGDATABASE
    scope: RUN_TIME
    value: ${db.DATABASE}
  - name: PGUSER
    scope: RUN_TIME
    value: ${db.USERNAME}
  - name: PGPASSWORD
    scope: RUN_TIME
    value: ${db.PASSWORD}
```

# Exercise: deployment database

```
cp src/3-app.yaml .do/app.yaml
cp src/3-index.js backend/index.js
# update
ID=$(doctl app list | awk '/tutorial-app-platform/ { print $1}')
echo $ID
doctl app update $ID --spec .do/app.yaml
```

# Guestbook