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From Smart Home to Smart Cats: extending home automation to pets

Paolo Insogna

Node.js TSC, Principal Engineer @ **Platformatic**

No automation, no party!



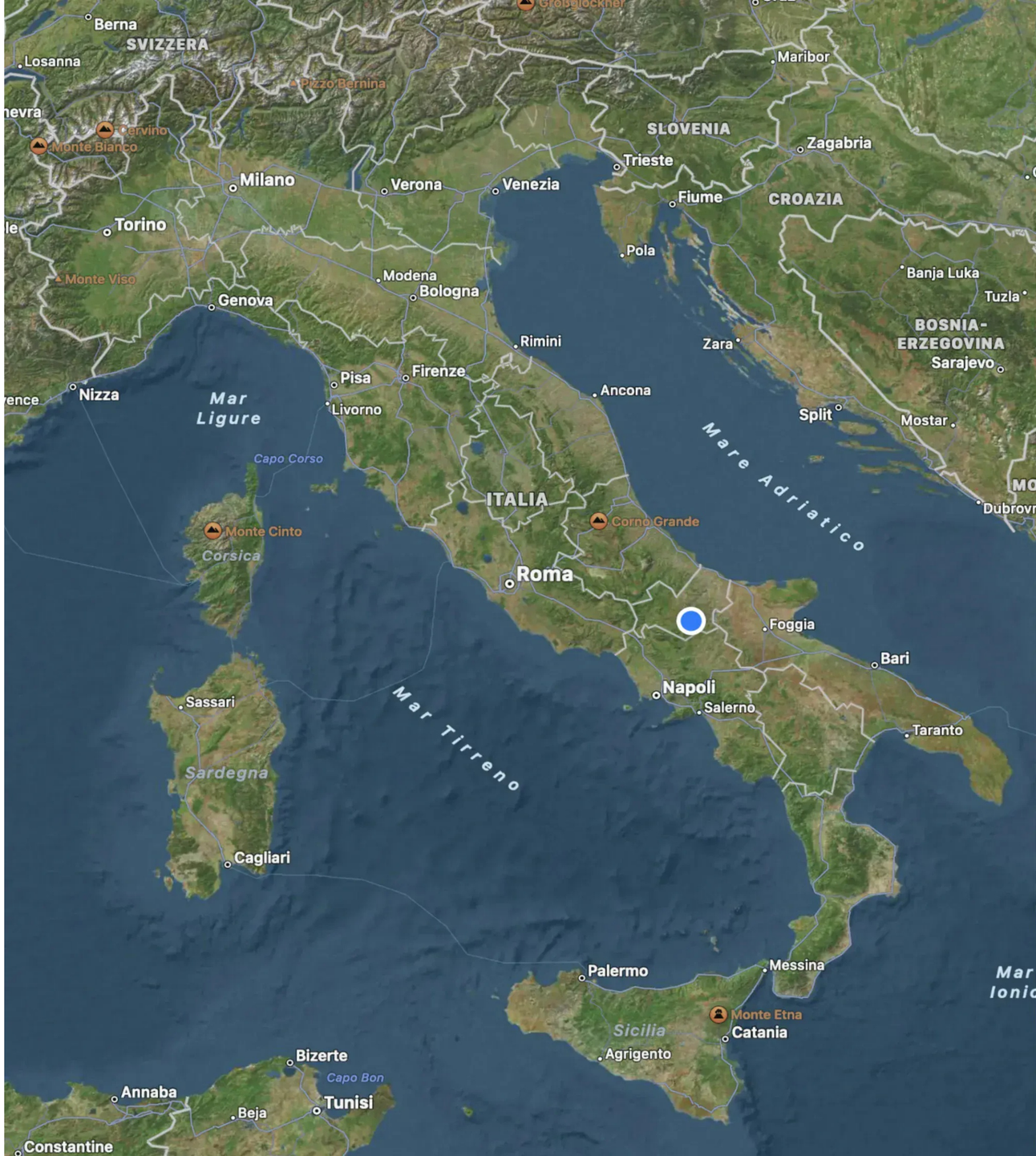
Hello, I'm **Paolo**!



Node.js Technical Steering Committee Member

Platformatic Principal Engineer

`paoloinsogna.dev` `ShogunPanda` `p_insogna` `pinsogna`



A lot has changed in the last few years



Networking is everywhere

Have you ever heard of a connected coffee machine?



The majority of the (western) population has a smartphone

There's an app for everything™, isn't it?



Just connect the dots

Internet of Things was just a matter of time.

I'm literally surrounded by lovely chubby cats...





...and I deeply love them!

There are three types of people

1. **People who worship cats**
   You'll enjoy this talks and probably get some evil ideas.

2. **People who are fine with cats**
   I'll make you happy with the home automation.

3. **People who hate cats**
   Please leave, NOW!

I automated their lives...





...since my wife kept collecting new cats!

A little disclaimer

In this talk I'll mention many brands and products.



Nobody is sponsoring me

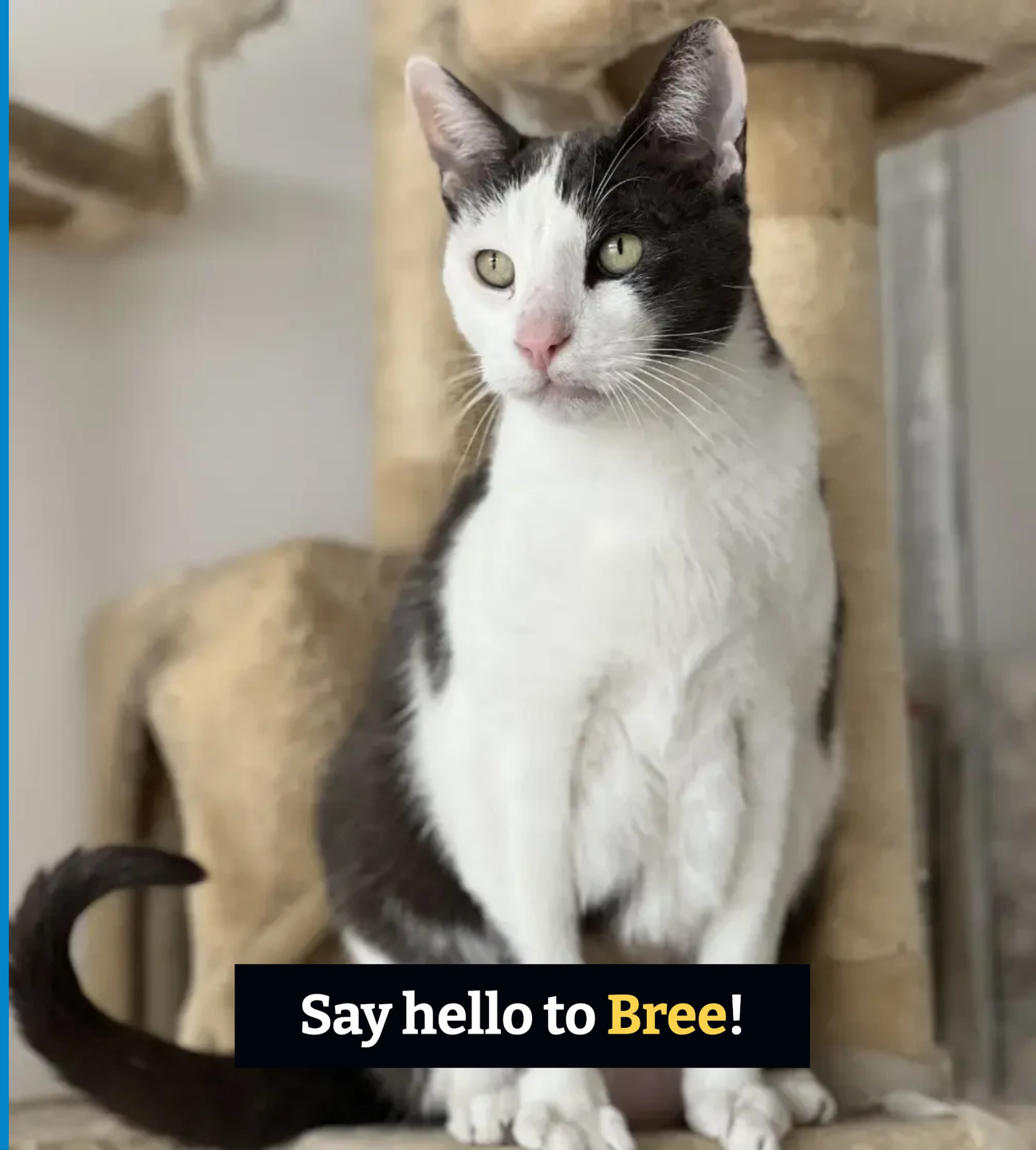
It just happen that these products were the best for my specific needs.



No brand knows I'm here

So everything that follows is just my personal opinion and experience.

Let's start!



The beginning

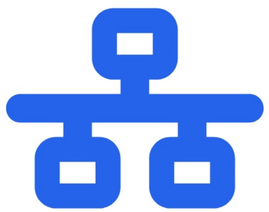
It started with my home alarm system.

KSenia Lares 4.0
It is a innovative home alarm and automation system all **made in Italy**.

Comprehensive solution
It can control alarms, sensors, doors, windows and many other devices.



KSenia Lares 4.0: How do you control it?



WebSocket based protocol

There is a WebSocket endpoint which is both used by the Web UI and also exposed as API.



Documentation is available

Once you know how to obtain the SDK documentation, you are good to go.

It's hot...
no wait, it's cold!



Let's optimize

Once the house was under control, it was time to take care of climate control.

Panasonic Aquarea as primary device
It's an electric heat pump which can either heat or cool your house.

Ferroli BlueHelix as secondary heater
Despite the name, it's connected via sealed Chinese cloud. **I gave up here!**



Panasonic Aquarea: How do you control it?

1

Use their service Website

The availability of the service was unfortunately questionable.

2

Use a custom MQTT firmware

Let's thank some nice devs of GitHub!
I modified the LAN interface.

Shall I buy a power plant?



With the power of the Sun I will win!

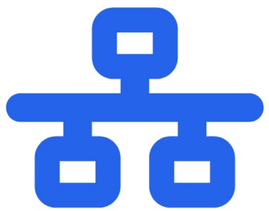
After installing solar panels I was able to optimize power consumption.

Fronius Primo
A very easy to use and connected inverter.

This was a blessing
I reduce my power bills by **66%**!



Fronius Primo: How do you control it?



HTTP enabled

The inverter exposes an API to query data.



Documentation is available

You can download it from the Fronius website.

Don't brag, you still use gas to move!



What have I told you about the sun?

I switched to electric cars and therefore I installed a wallbox.

ABB Terra
It supports single-phases or three-phases system, up to 22KW power.

ENEL is my enemy now
The voltage level in my house is completely unreliable. Somebody protect my devices!



ABB Terra: How do you control it?

1

OCPP

It's a open standard for wallboxes.
I couldn't find a Node.js implementation.

2

ModBus

Via a RS485 to (W)LAN adapter,
I was able to control the device.


Gimme the cats!


It all started with Bree

He was always hungry



No matter the time
It's food o' clock!



No matter if you had a life
You had to feed him 3-4 times a day.



Persistent staring or vocalizing can kill you
His biological clock was better than an atomic one.

Thanks progress

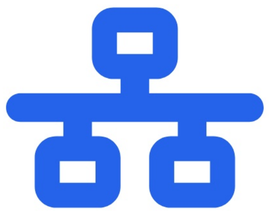
After many years of struggling, I found the perfect solution.

PetKit FreshElement Solo
Cheap, easy to use and reliable.

App controlled
But the UX is **questionable**.



PetKit FreshElement: How do you control it?



HTTP API

It has an easy to use HTTP API.



Let them be fat

The API accuracy varies per device.

Why don't you complicate things?



In 2020 we moved



Bigger house, more cats

Do you remember what I said about collecting?



We (kinda) still live in the city

But we are literally on the border, in the countryside.



Wild animals are everywhere

After 30+ years I had to deal with foxes and similar on a daily basis.

Let's protect them!



Can't beat a classic

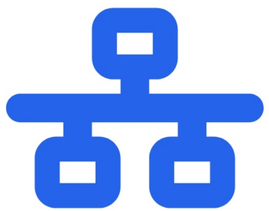
There are some solutions that take advantage of pets' subcutaneous chip.

Sure PetCare Microchip Pet Door
Modern and comprehensive. Also pretty cute.

Just the good, old RFID.
The technology is more than 50 years old.



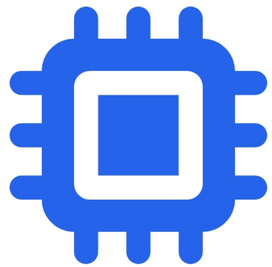
Microchip Pet Door: How do you control it?



HTTP API

The same used by the app and the website.

Yes, the app is just a web view.



MQTT on the way

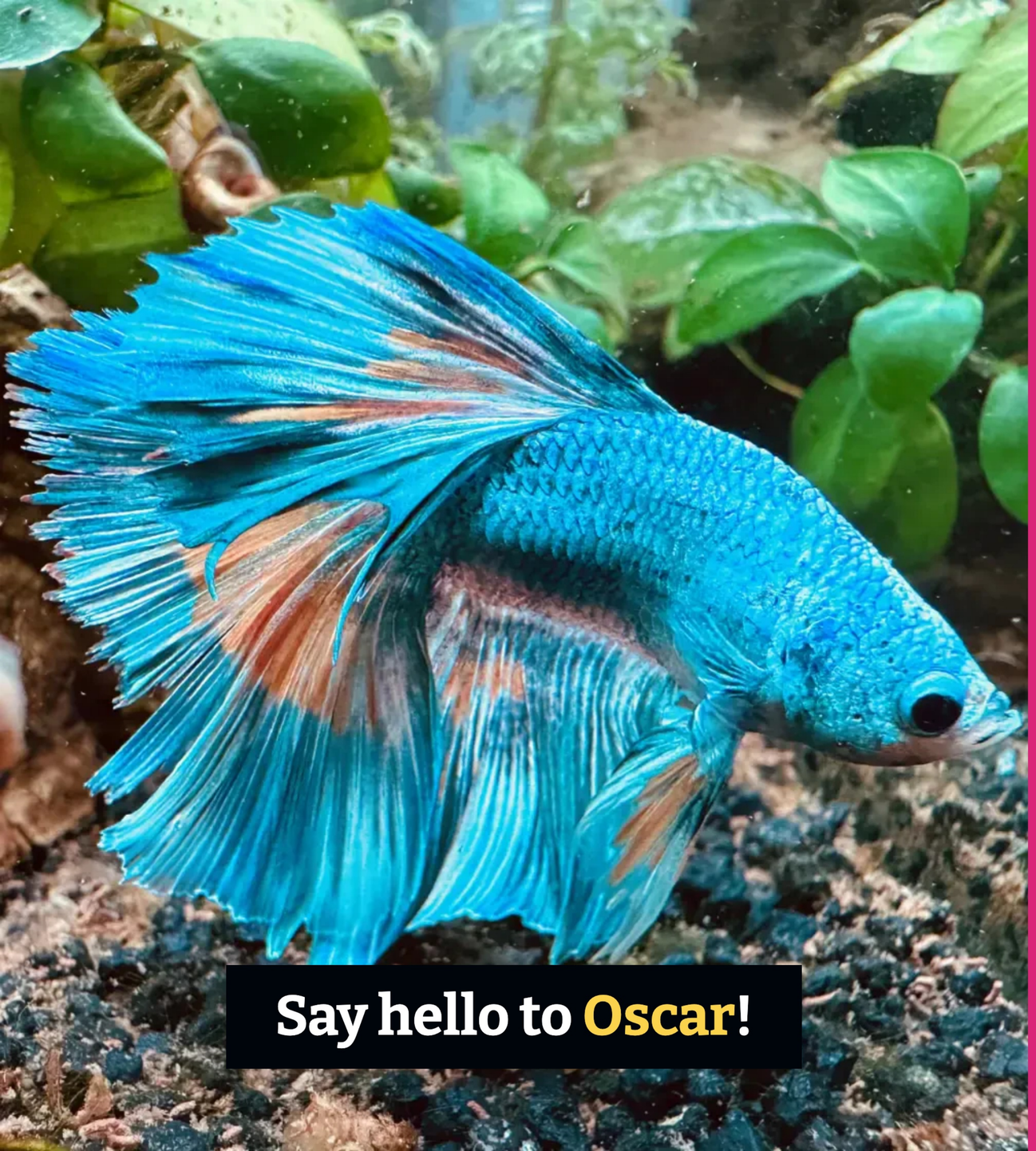
Some other good people on GitHub are working on a custom firmware.

Did you really believe it was just about cats?



Sadly, I couldn't automate his life (yet)...





... but I could automate his. Why not?

What is the fastest way to get a divorce?

Just discovered a new brand.

Shelly devices
Small, cheap and made for the geeks.

They support a lot of protocols
MQTT, HTTP, WebSocket, you name it.



It also helps with X-Mas!



And that's my house!



Home assistants

Let's talk about the most known vendors.



Apple HomeKit



Google Home



Amazon Alexa



Home Assistant

What do they have in common?



Do not reinvent the wheel

All integrations are (mostly) based on existing technologies.



It's all about presentation

Connecting the dots was the deal breaker.



They expose a (semi) public API

Anybody can write new devices or new integration.

The Perseveranza™ technical stack (1/2)



Node.js



Redis



Mosquitto

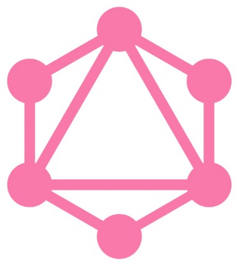
The Perseveranza™ technical stack (2/2)



Fastify



HAP (Homebridge)



GraphQL

Gimme the details!



Where is the code?



None of your business. 😘

All the code is in GitHub private repositories.



It's completely opinionated

This time I was not aiming for the public.



You (should) know how to write an API

Don't be lazy!

Let's play a little game ...

What is her name?





The answer is ...

Cleo!

Remember ...

“Home is where the heart is.”

Plinius the Elder



One last thing™

“In ancient times cats were worshipped as gods.
They have not forgotten this.”

Terry Pratchett



This was my usual ending slide...

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But this talk is special. Thank you!

We miss you both, a very lot! ❤️

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