

Piperchat

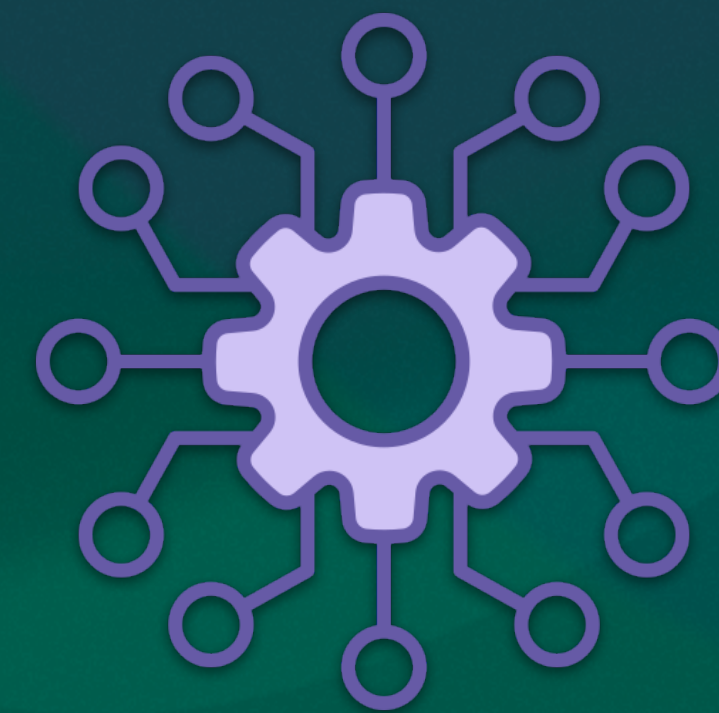
Sistemi Distribuiti



Manuel Andruccioli, Mazzoli Alessandro, Borriello Luigi, Patriti Tommaso - 23/01/2024

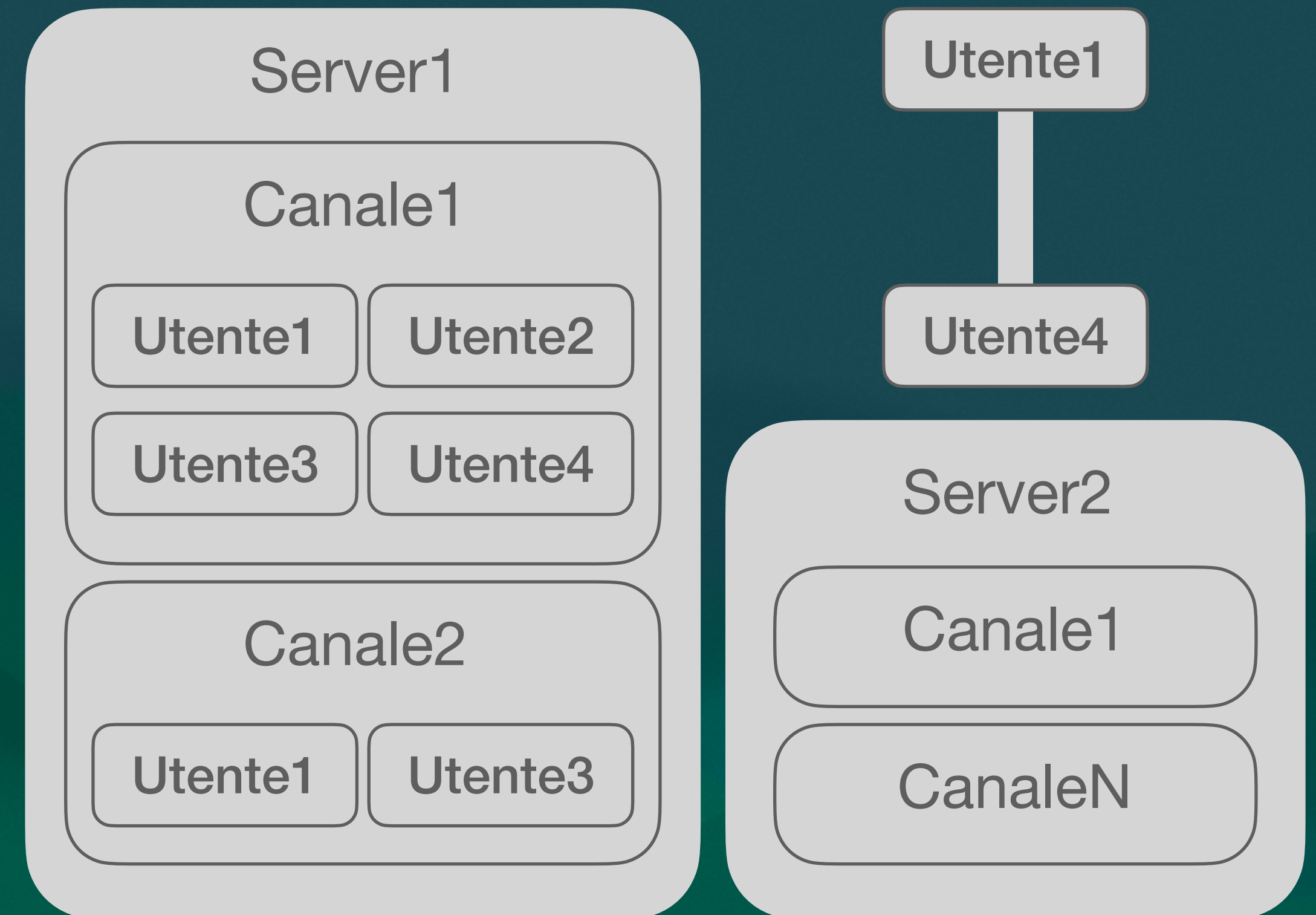
Obiettivi

- Realizzazione di una piattaforma ispirata a Discord:
 - Social network
 - Messaggistica
 - Videochiamate
- Architettura a microservizi



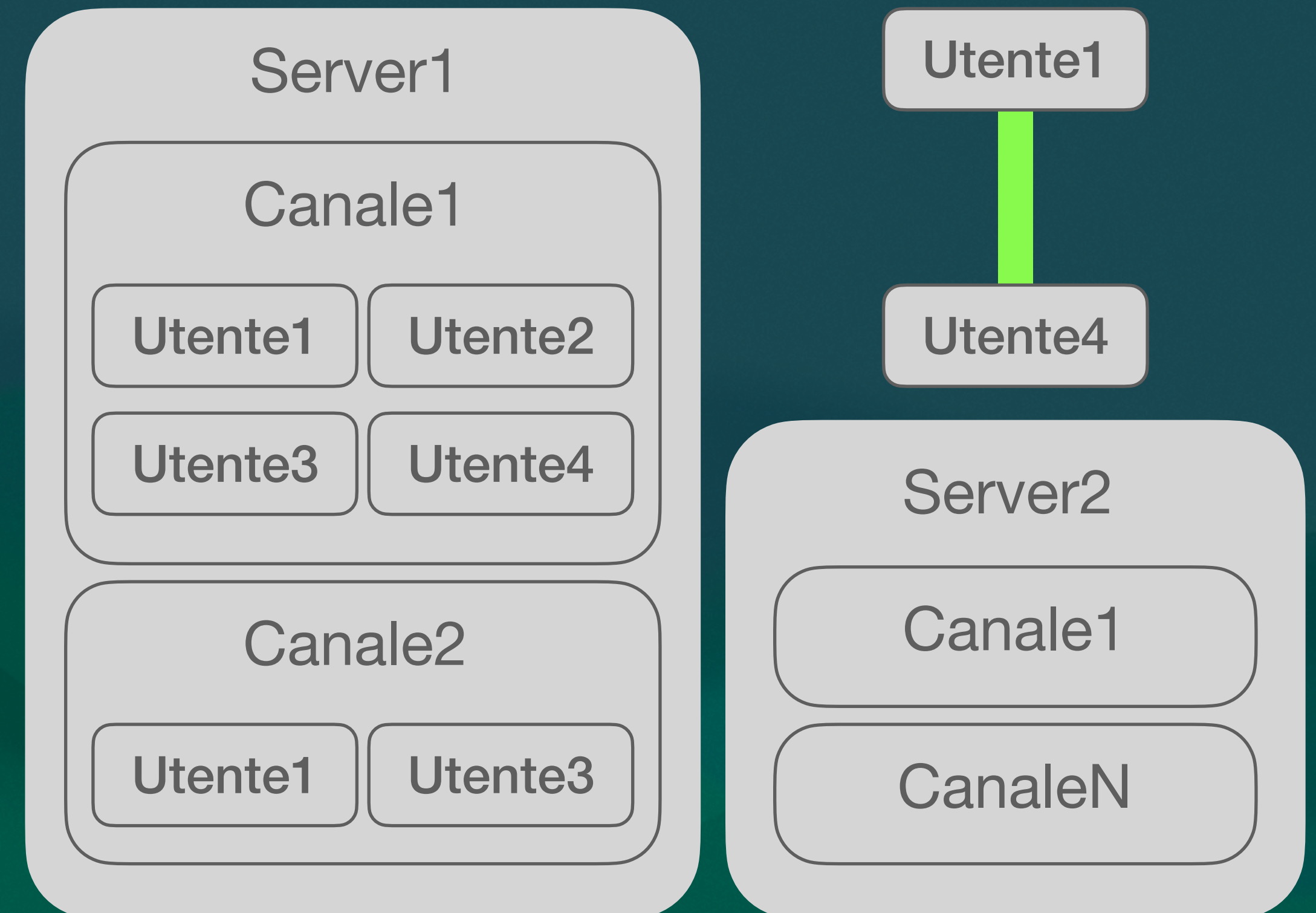
Requisiti Funzionali

- Registrazione e Autenticazione
- Sistema di amicizie
- Messaggistica tra utenti
- Gestione Server
- Gestione Canali testuali
- Gestione Canali multimediali
- Gestione chiamate tra utenti



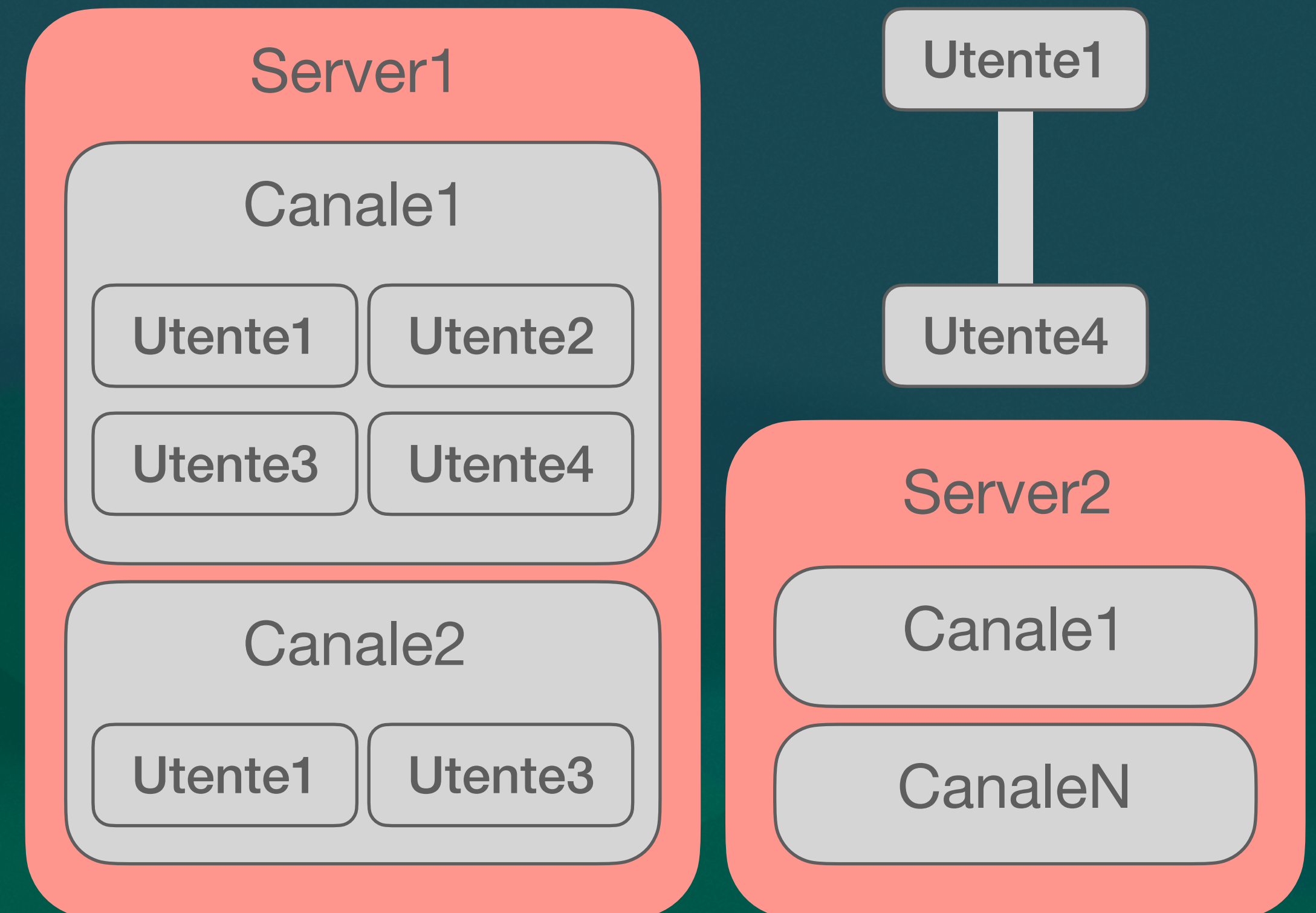
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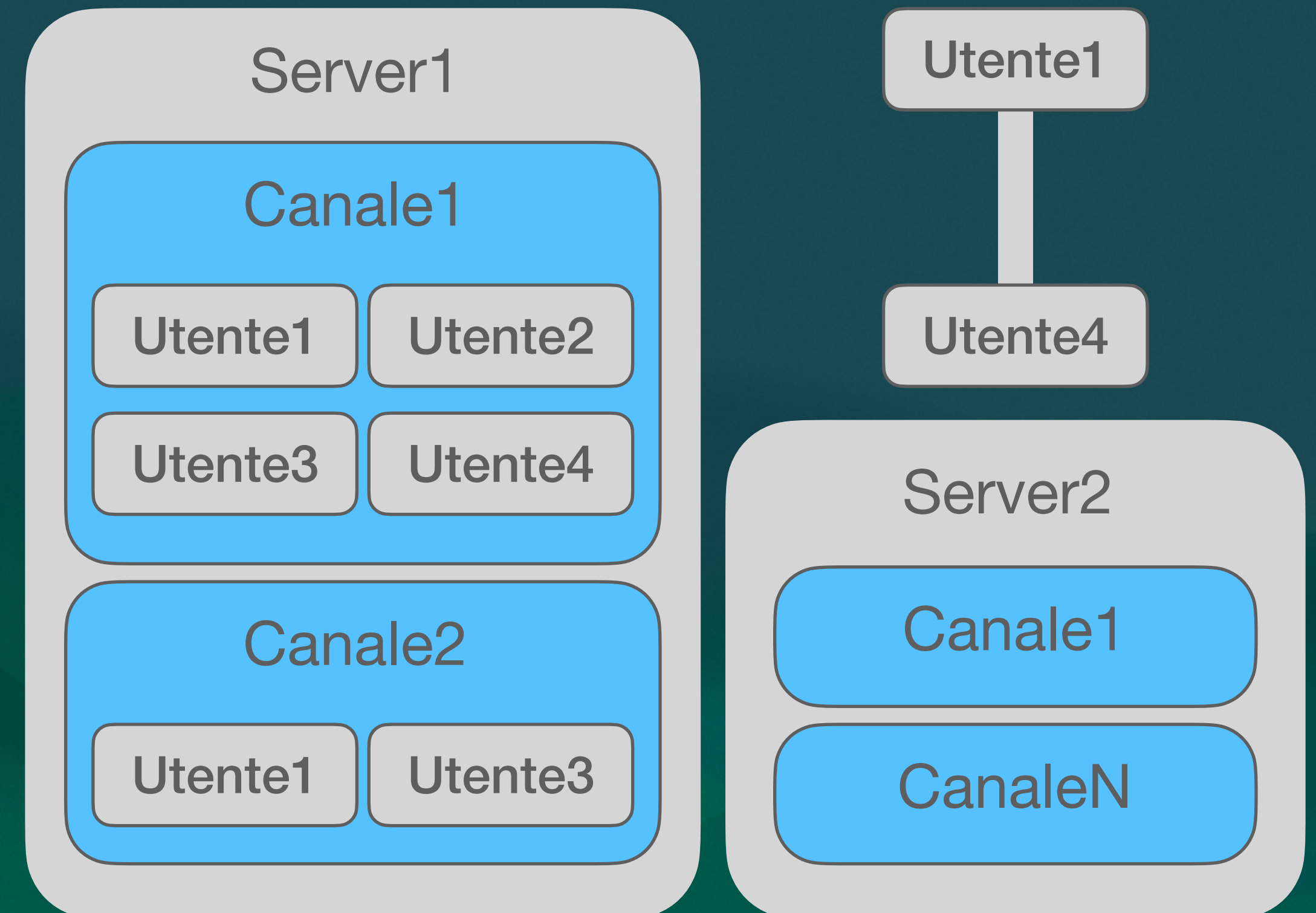
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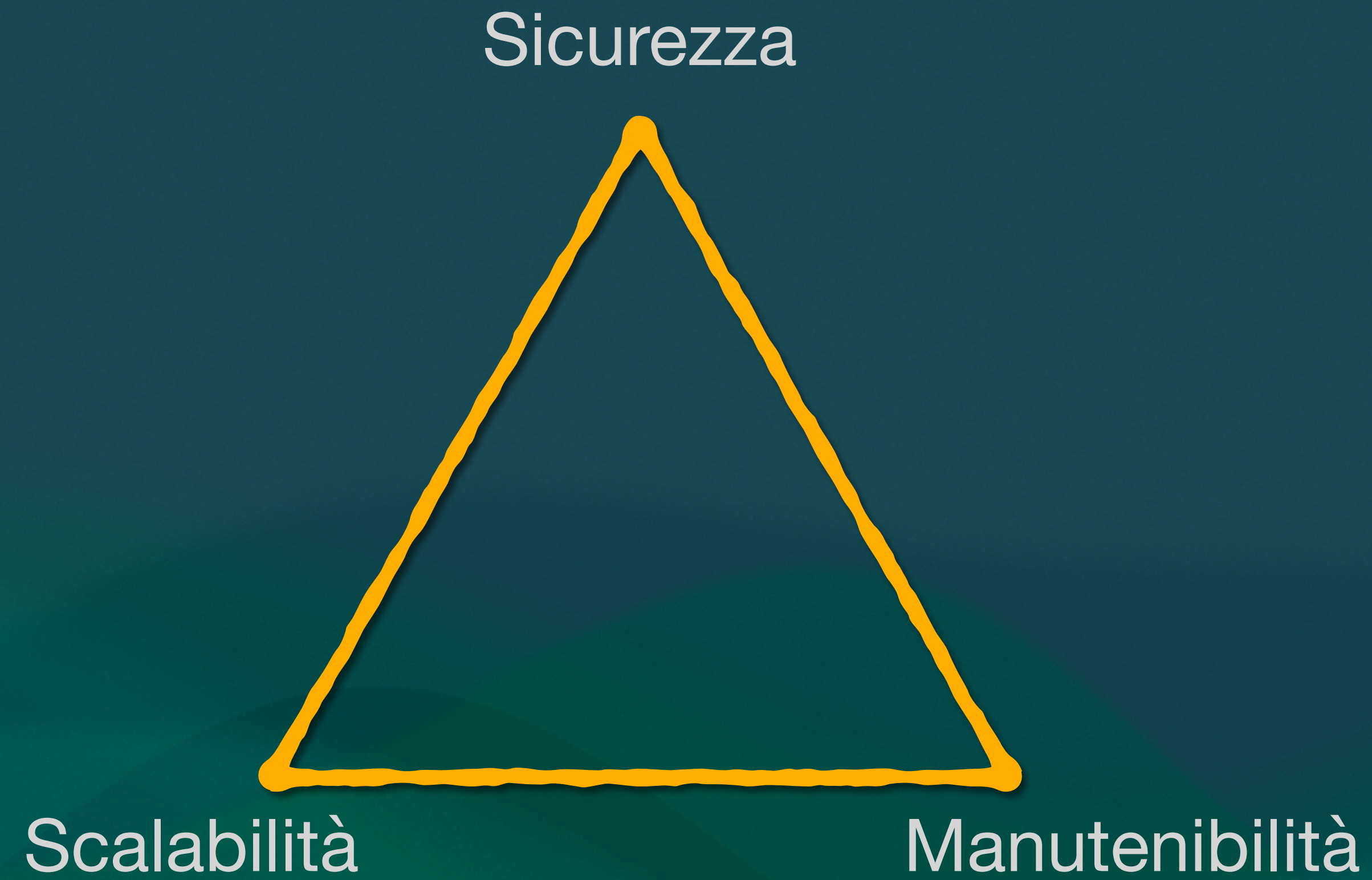


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Requisiti Non Funzionali



Stack

- Microservizi:
 - MongoDB
 - Express
 - NodeJs (Typescript)
- WebApp:
 - Vue (Typescript)
- Architettura:
 - Rabbit MQ (comunicazione microservizi)

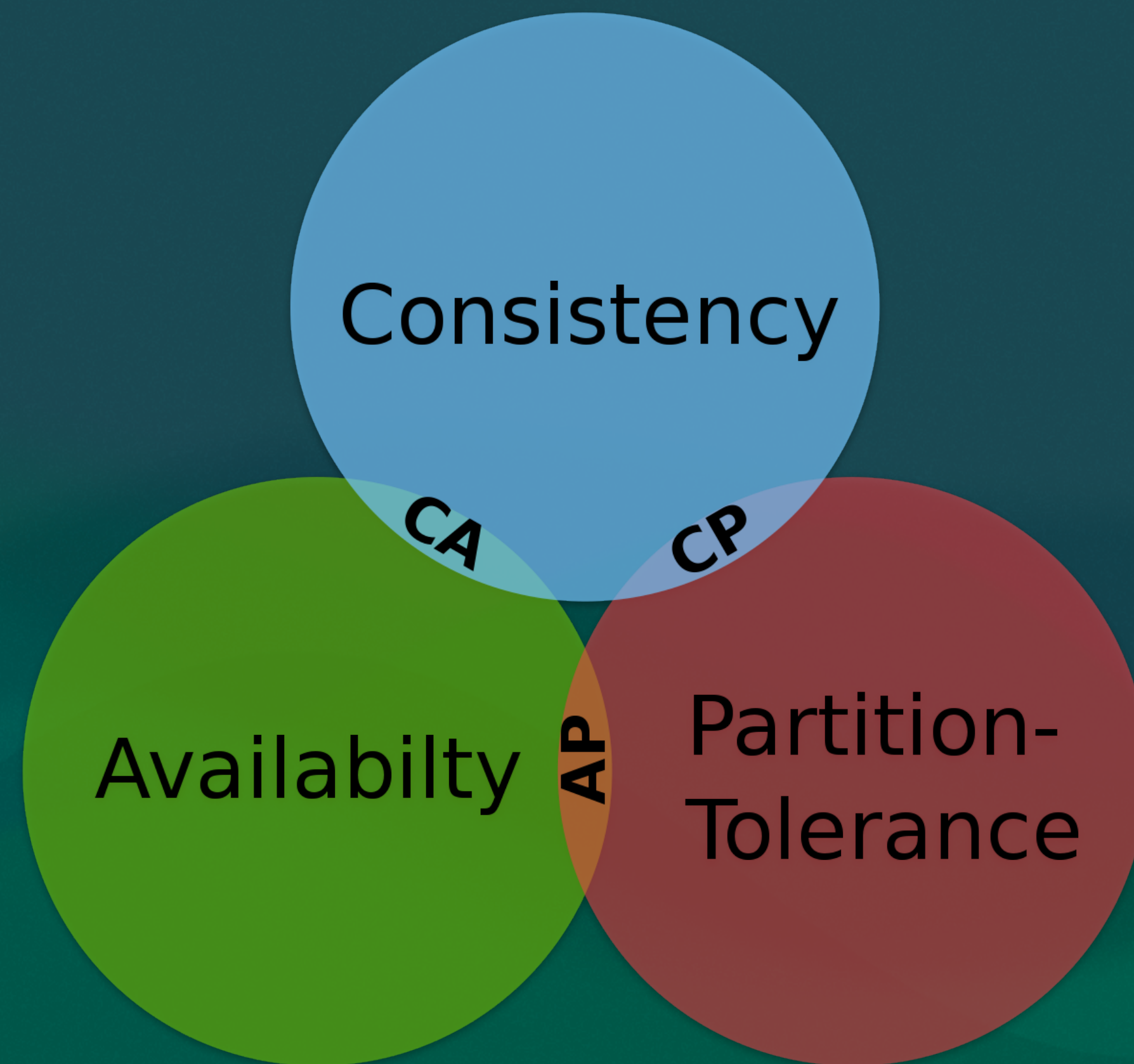


Tecnologie

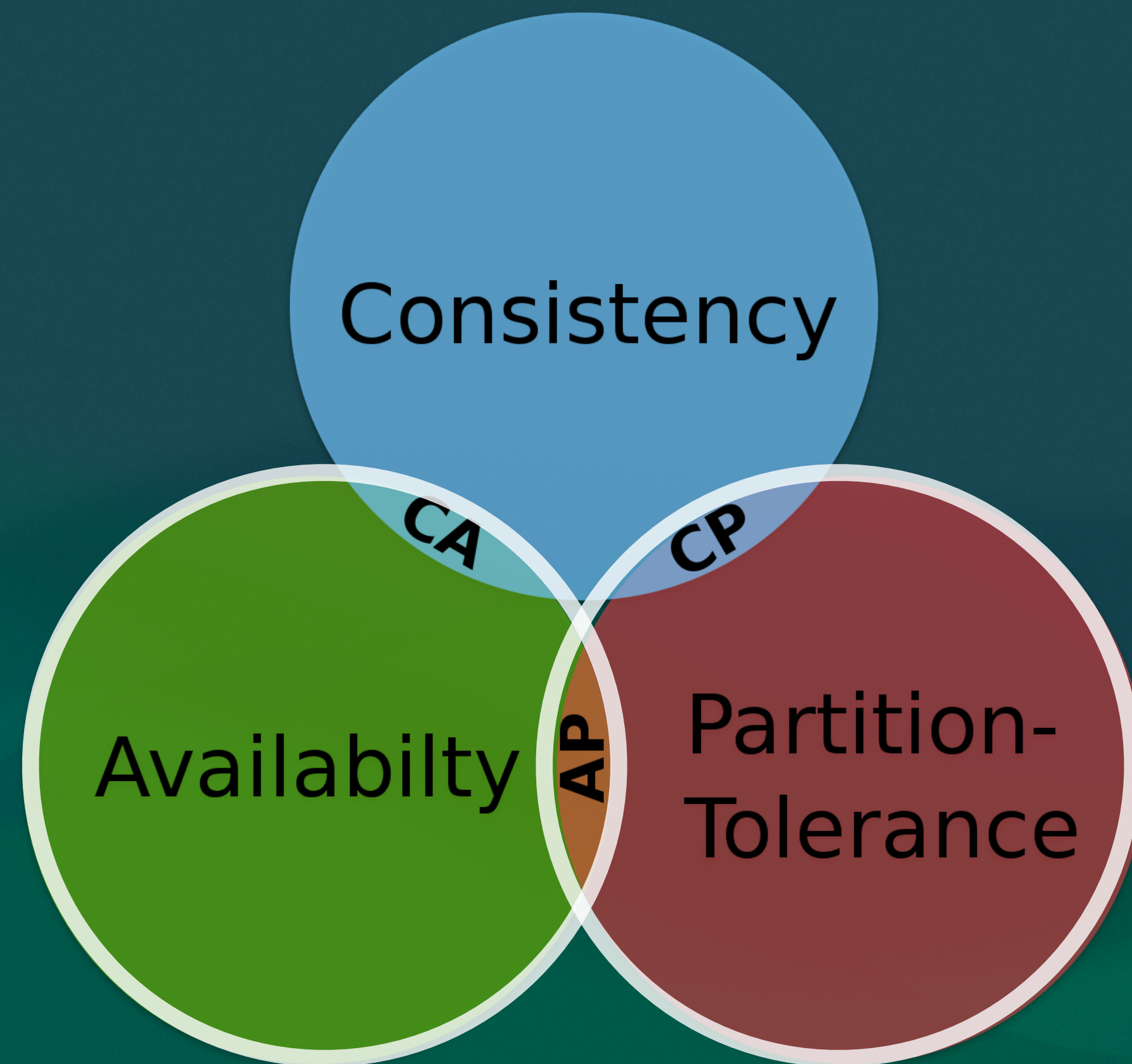
- JWT (autenticazione e autorizzazione)
- Socket.IO (comunicazione real-time)
- Docker (deploy)
- Traefik (gateway)
- WebRTC (chiamate audio/video p2p)



CAP Theorem



Soluzione adottata



Processo

- Agile
- Trello
- Git Flow
- Git Hook:
 - Lint
 - Prettier



Continuos Integration

- Github Actions
- Static Analysis
- Testing:
 - Dispatch
 - Update
- API Deploy
- Report Deploy



Dal design allo sviluppo





Microservizi

- Utenti:
 - Registrazione utenti
 - Autenticazione utenti:
 - JWT



Microservizi

- Utenti
- Piperchat:
 - Gestione Server
 - Gestione Canali

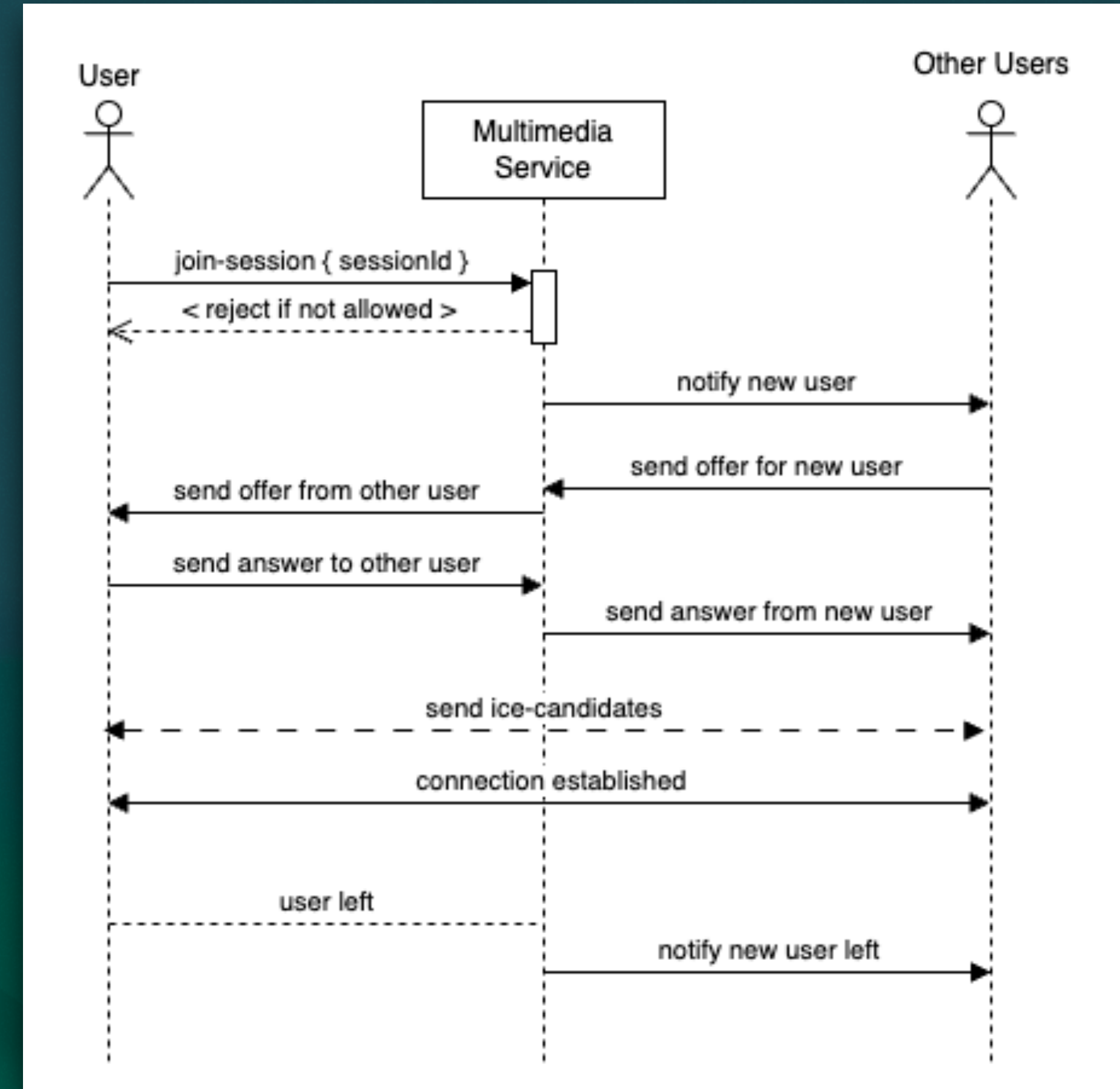


Microservizi

- Utenti
- Piperchat
- Messaggi:
 - Gestione messaggi testuali

Microservizi

- Utenti
- Piperchat
- Messaggi
- Multimedia:
 - WebRTC
 - Gestione chiamate audio/video
 - Session-based

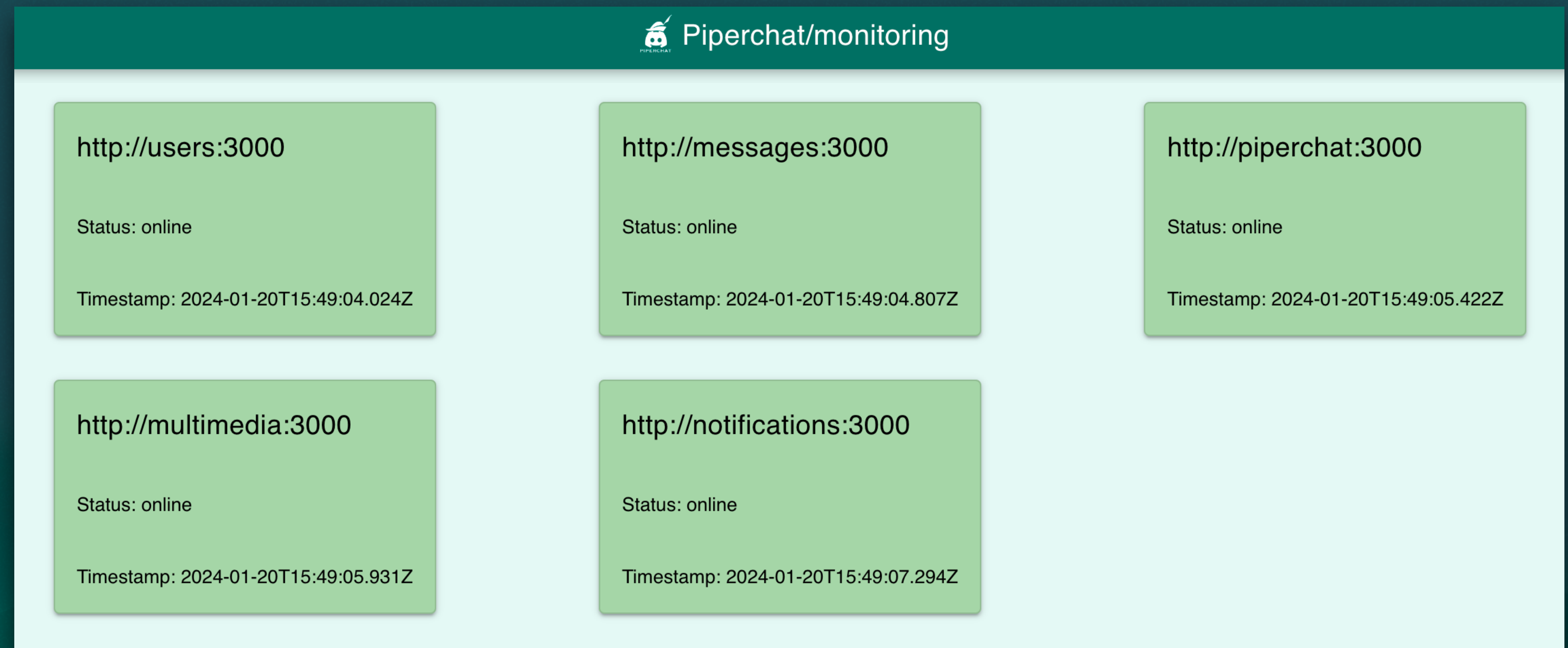


Microservizi

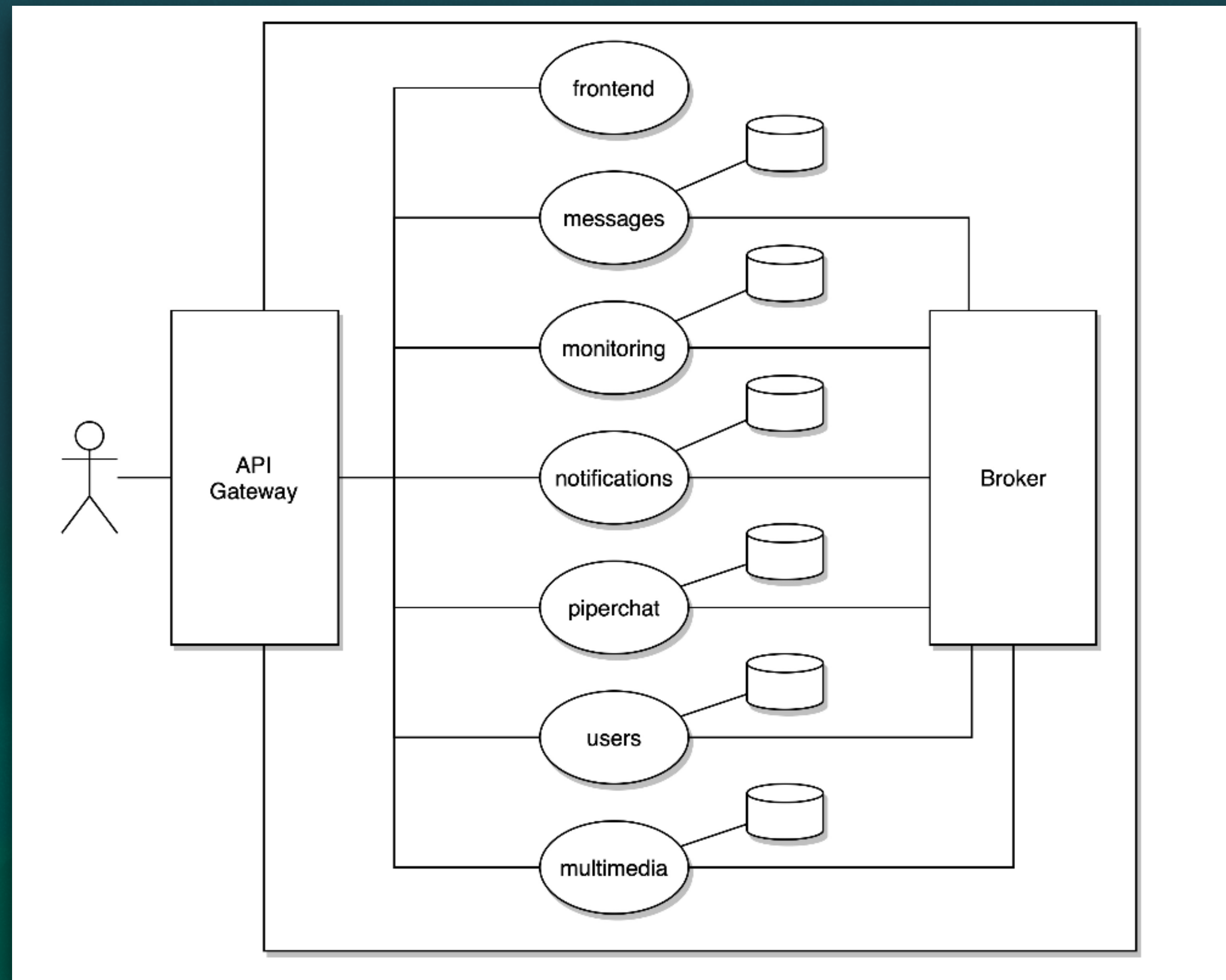
- Utenti
- Piperchat
- Messaggi
- Multimedia
- Notifiche:
 - Gestione delle notifiche real-time

Microservizi

- Utenti
- Piperchat
- Messaggi
- Multimedia
- Notifiche
- Monitoring:
 - Healthcheck dei microservizi (pull-based)
 - Logging degli eventi

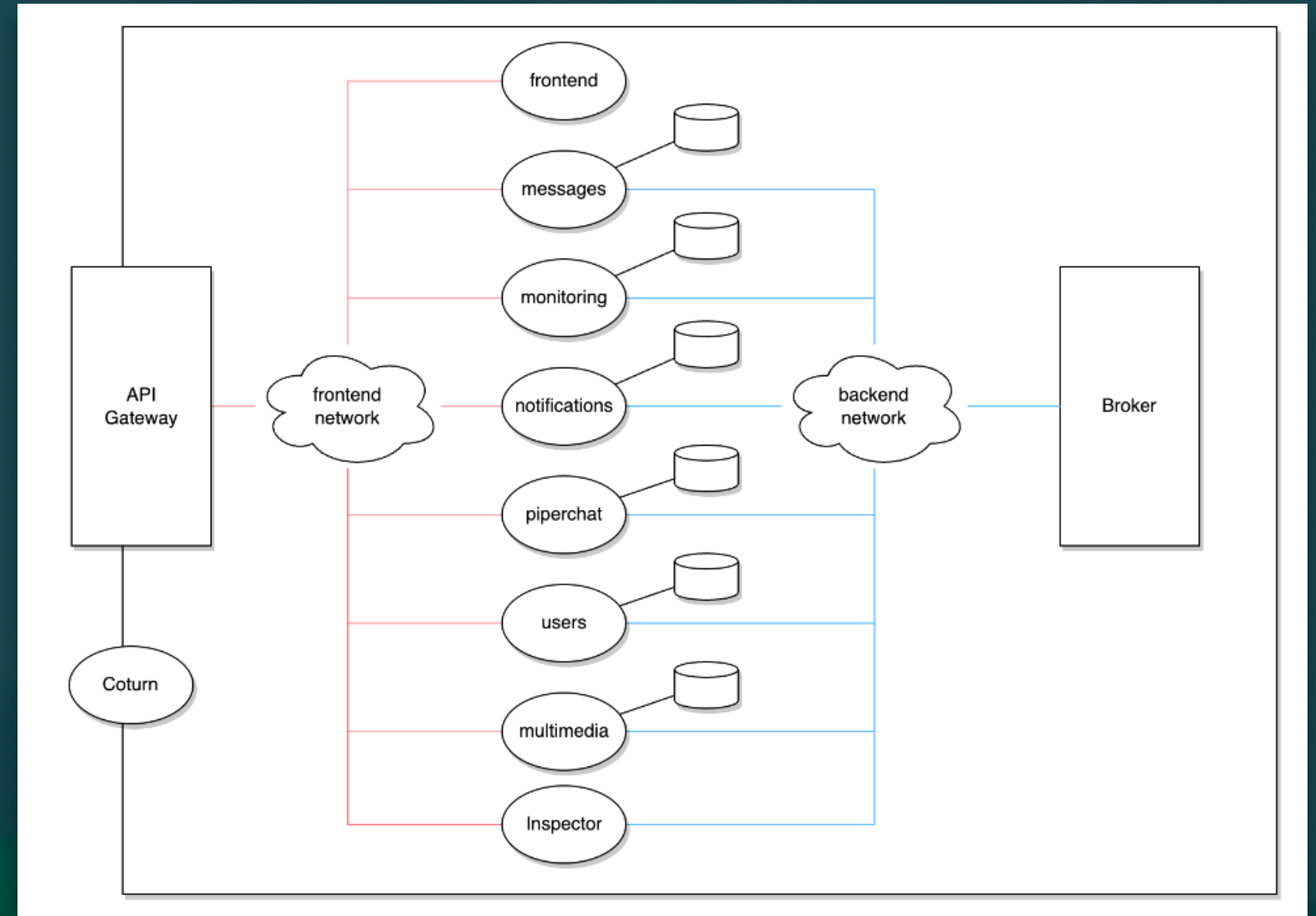


Architettura



Deploy

- Docker
 - Due reti distinte:
 - Backend
 - Frontend
 - Per ogni microservizio:
 - Uno o più container per il Webserver
 - Un container per il DB



Socket.IO vs Server Sent Events

Obiettivo: gestione delle notifiche per utenti collegati al sistema

Utente *online* $\iff$ può ricevere *notifiche*

Socket.IO

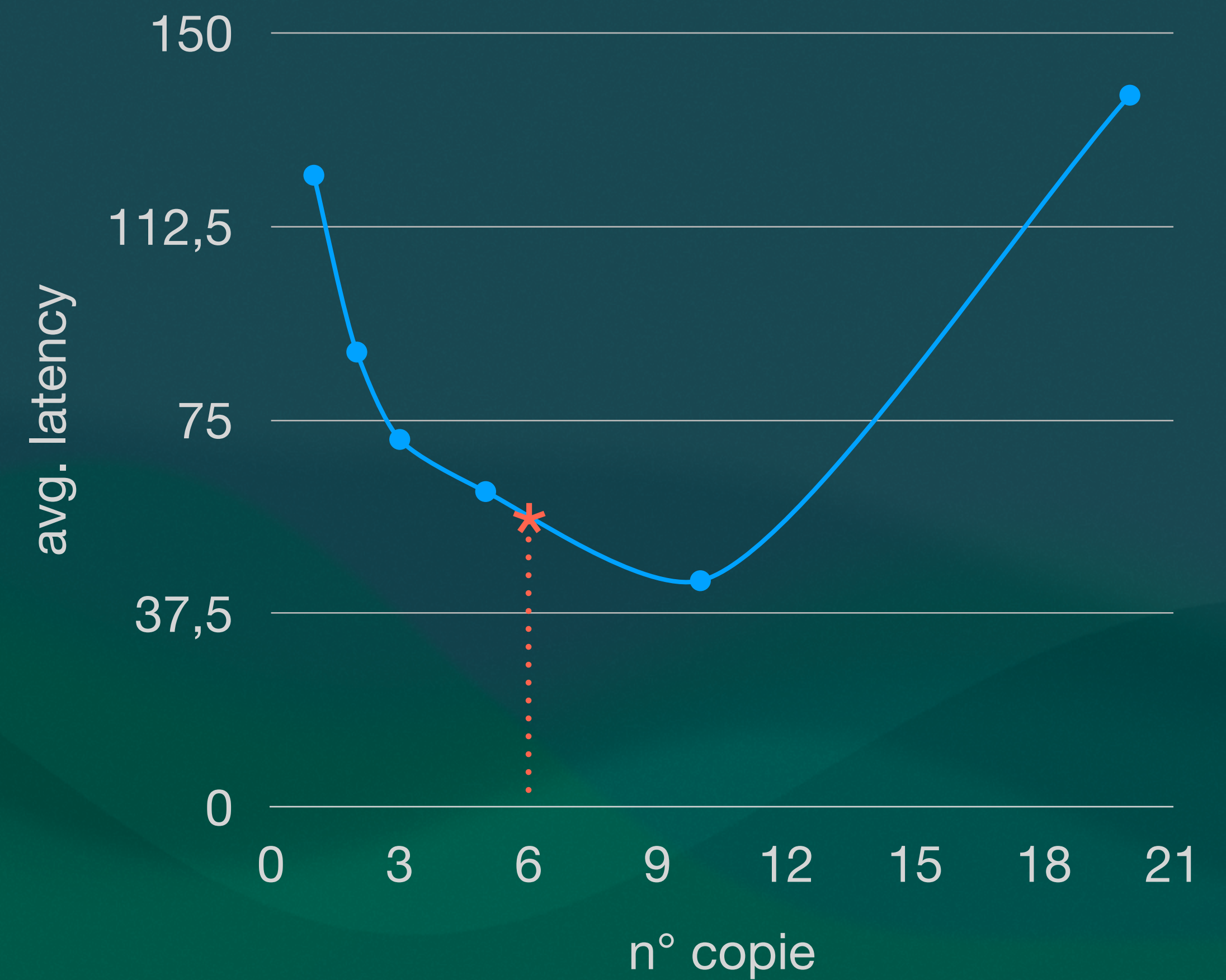
- Comunicazione bidirezionale
- Diversi sub protocolli (polling, WebSocket, WebTransport)
- Possibilità di gestire disconnessioni !

Server Sent Events

- Comunicazione mono-direzionale
- Minor overhead

Benchmarking

* = n° core processore



API

ReST

auth Everything about authentication ^

POST

/auth/login Login a user

✓

POST

/auth/register Register a new user

✓

POST

/auth/logout Logout a user

🔒 ✓

POST

/auth/refresh-token Refresh token

🔒 ✓

Notifiche utente

#0 **DirectMessage**
A user send a direct message to you
APPLICATION/JSON
Message ID **DirectMessage**
Payload > Expand all **Object**

Messaggi infra servizi

PUB user.logged.in
A user logged in
Operation ID **subscribe**
Available only on servers:
internal
Accepts the following message:
User
A user
APPLICATION/JSON
Message ID **User**
Payload > Expand all **Object**

Testing

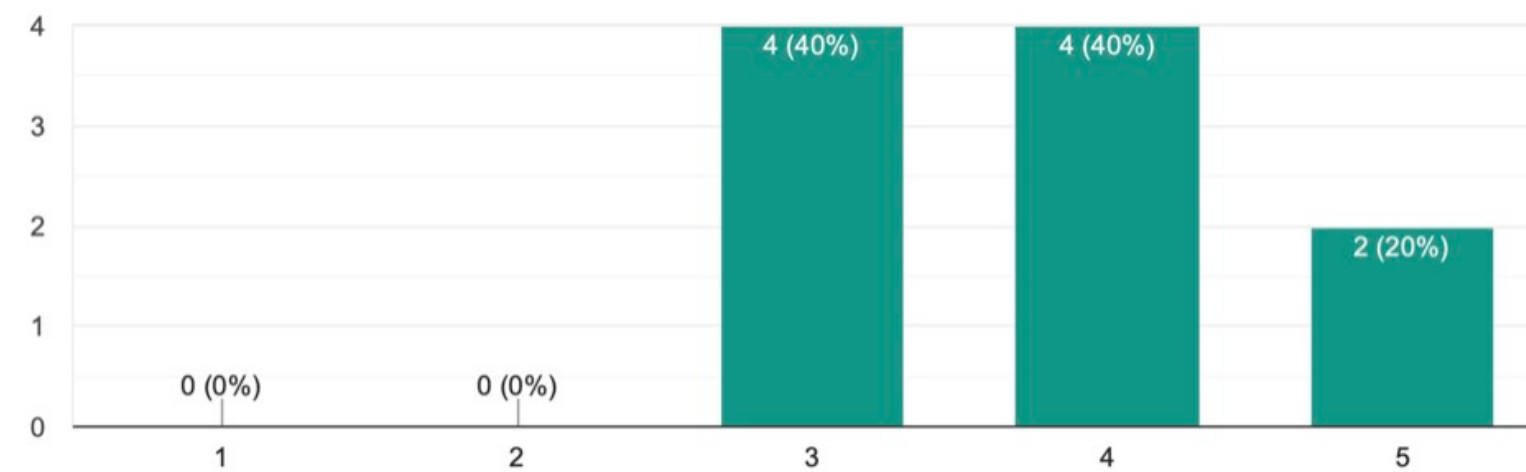
- Test di microservizi
 - Postman
 - Jest



Test con utenti

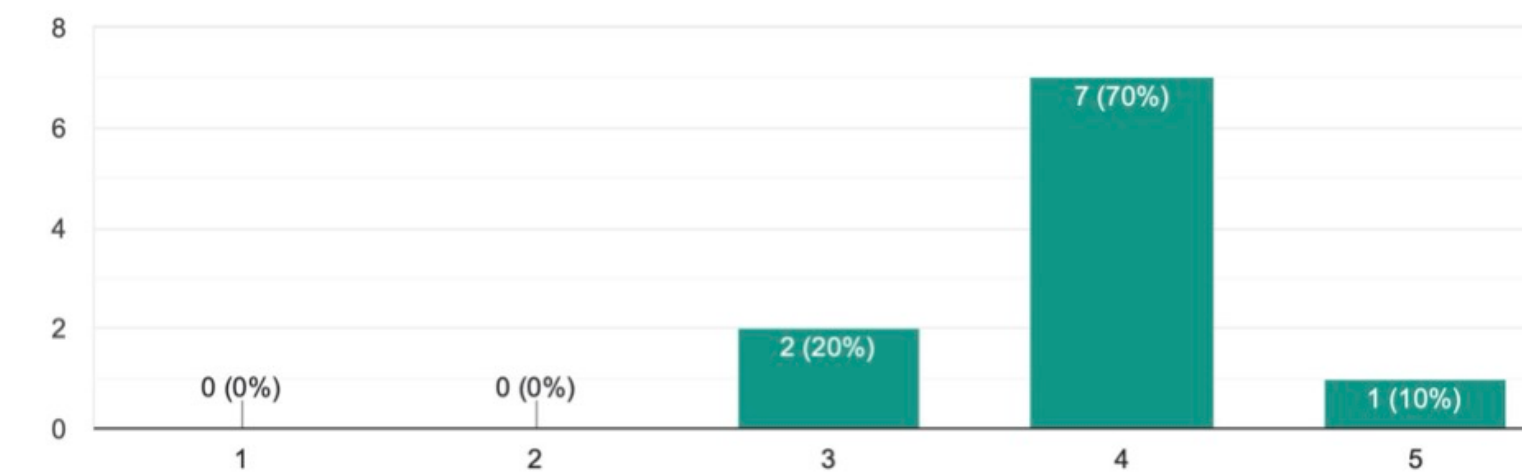
Facilità d'uso

10 risposte



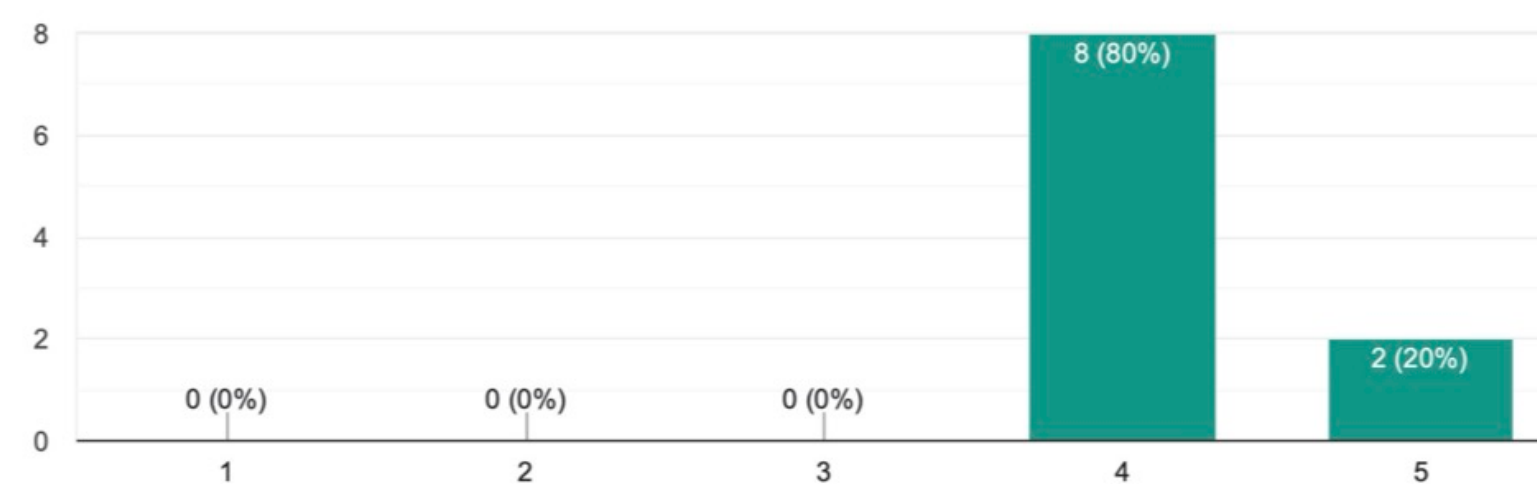
Grafica

10 risposte



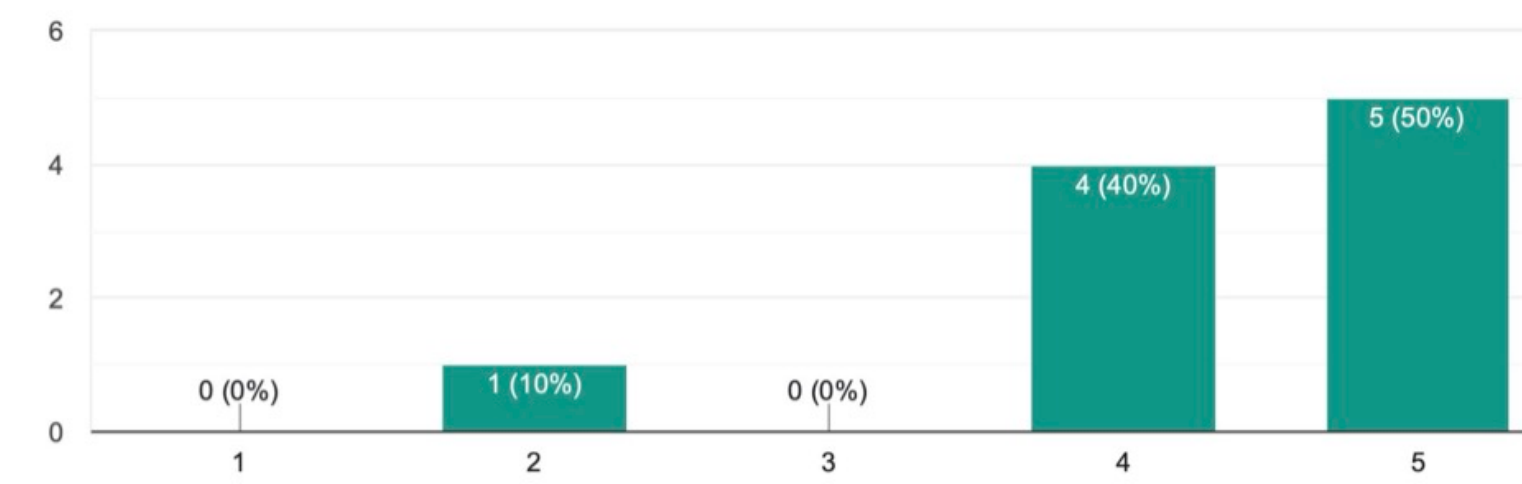
Funzionalità

10 risposte



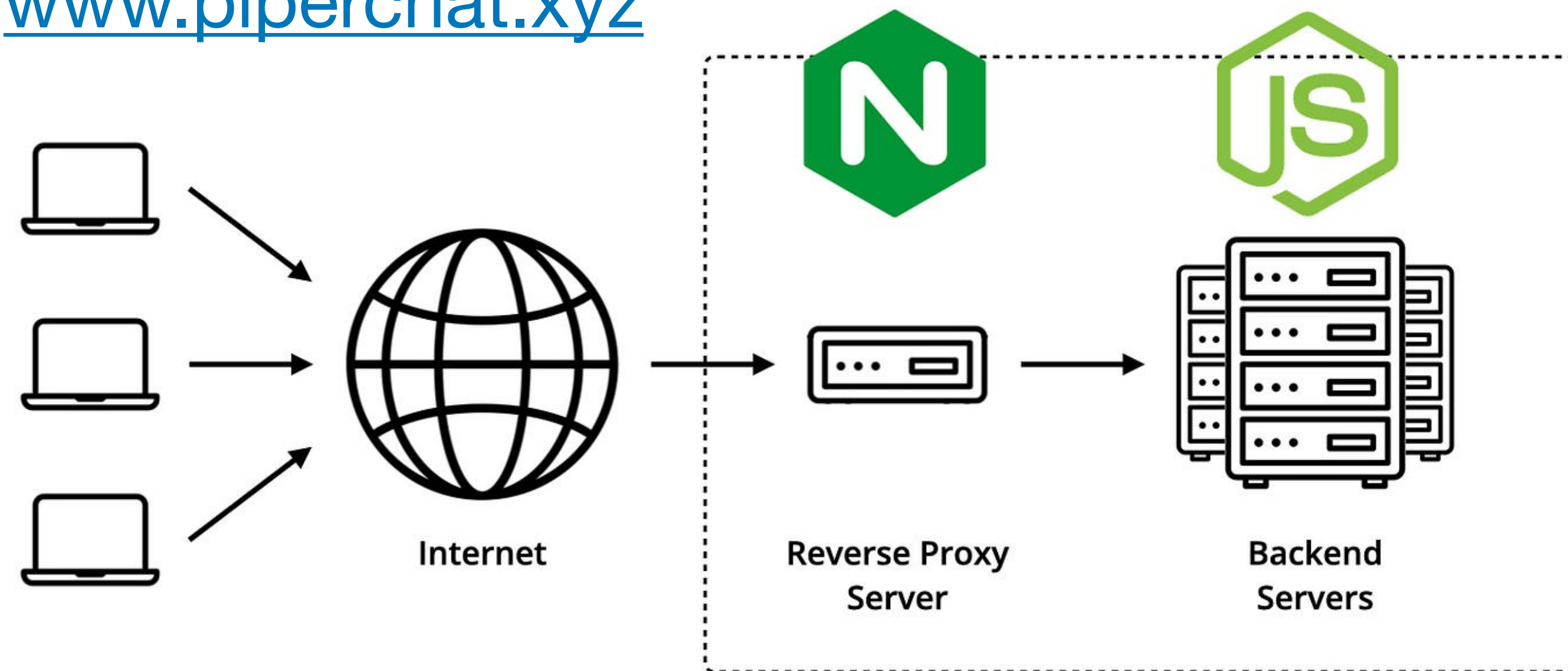
Soddisfazione d'utilizzo

10 risposte



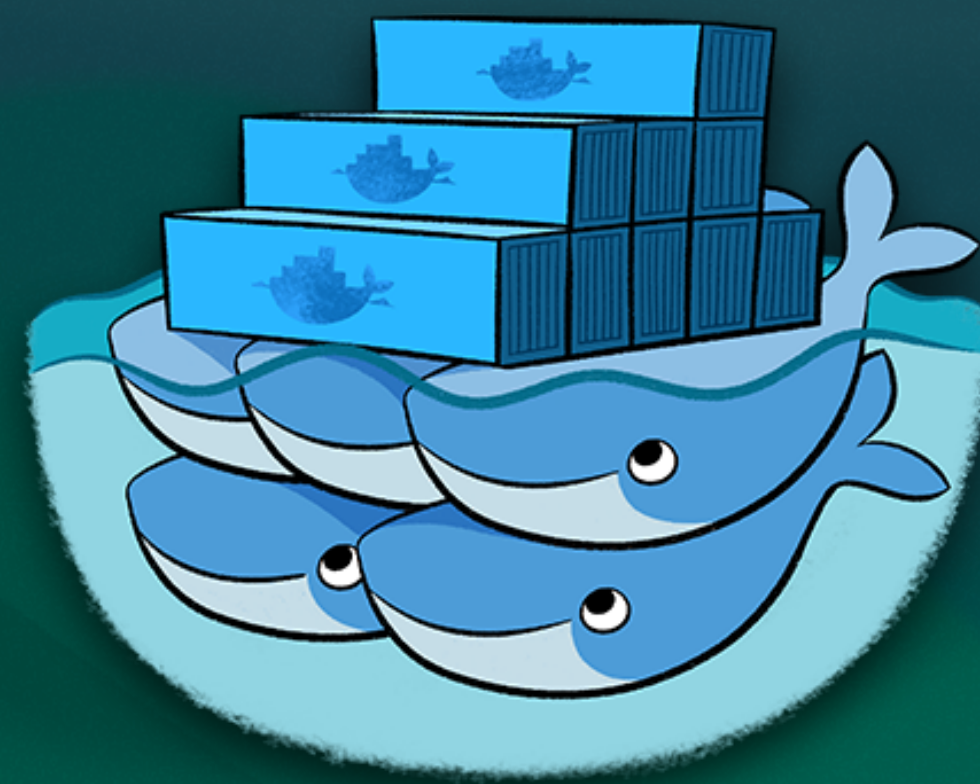
Real Deploy

www.piperchat.xyz

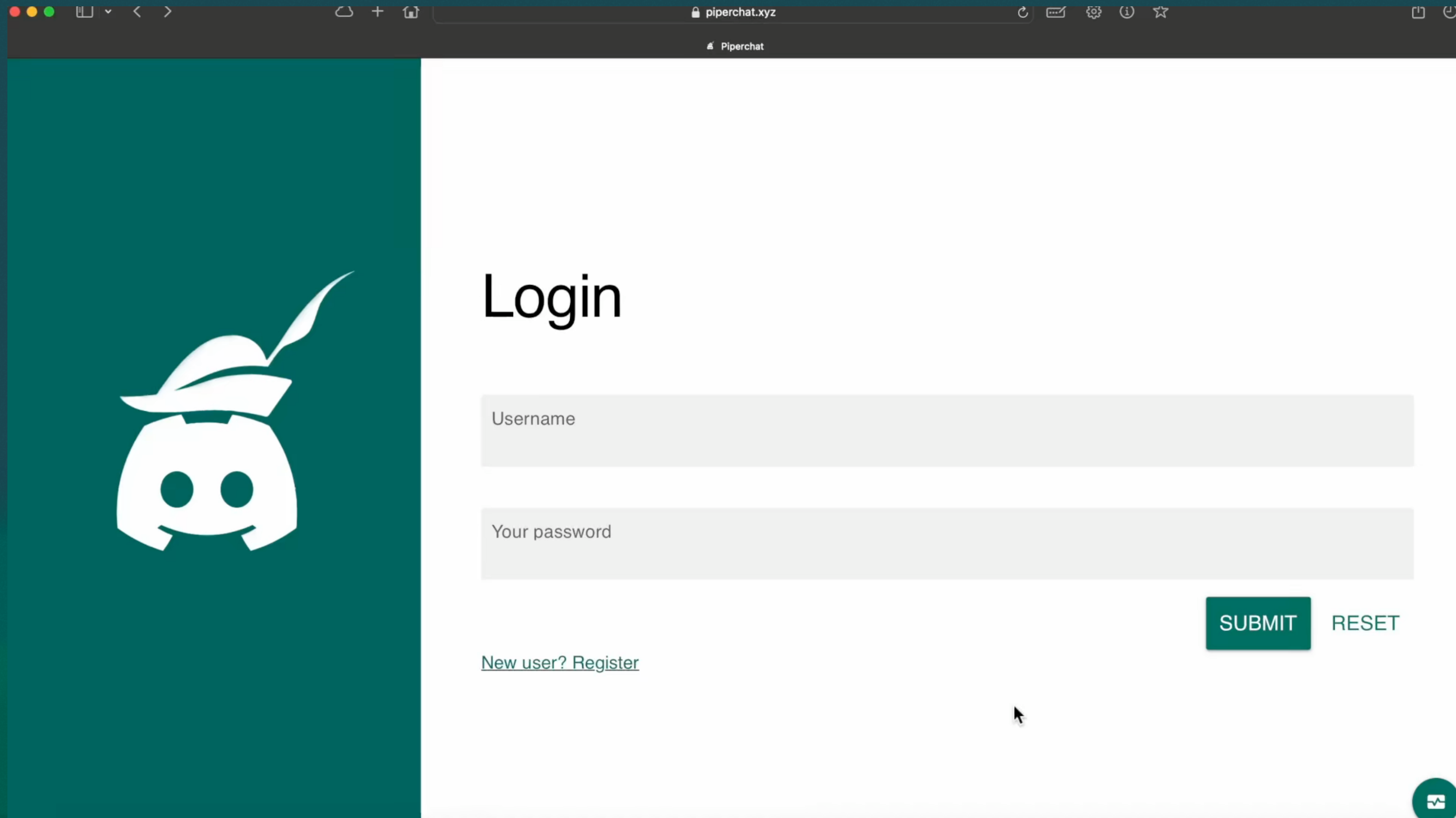


Sviluppi futuri

- Dashboard per la visualizzazione e analisi dei log
- Deploy su Docker Swarm



Registrazione ed autenticazione



The screenshot shows a web browser window with the address bar displaying 'piperchat.xyz'. The page has a dark teal header with the 'Piperchat' logo. On the left, there is a large teal sidebar containing a white Discord logo. The main content area is white and features a 'Login' heading. Below the heading are two input fields: 'Username' and 'Your password'. To the right of these fields are two buttons: 'SUBMIT' (teal) and 'RESET' (light gray). At the bottom left of the login area, there is a link that says 'New user? Register'. A mouse cursor is visible near the bottom center of the page.

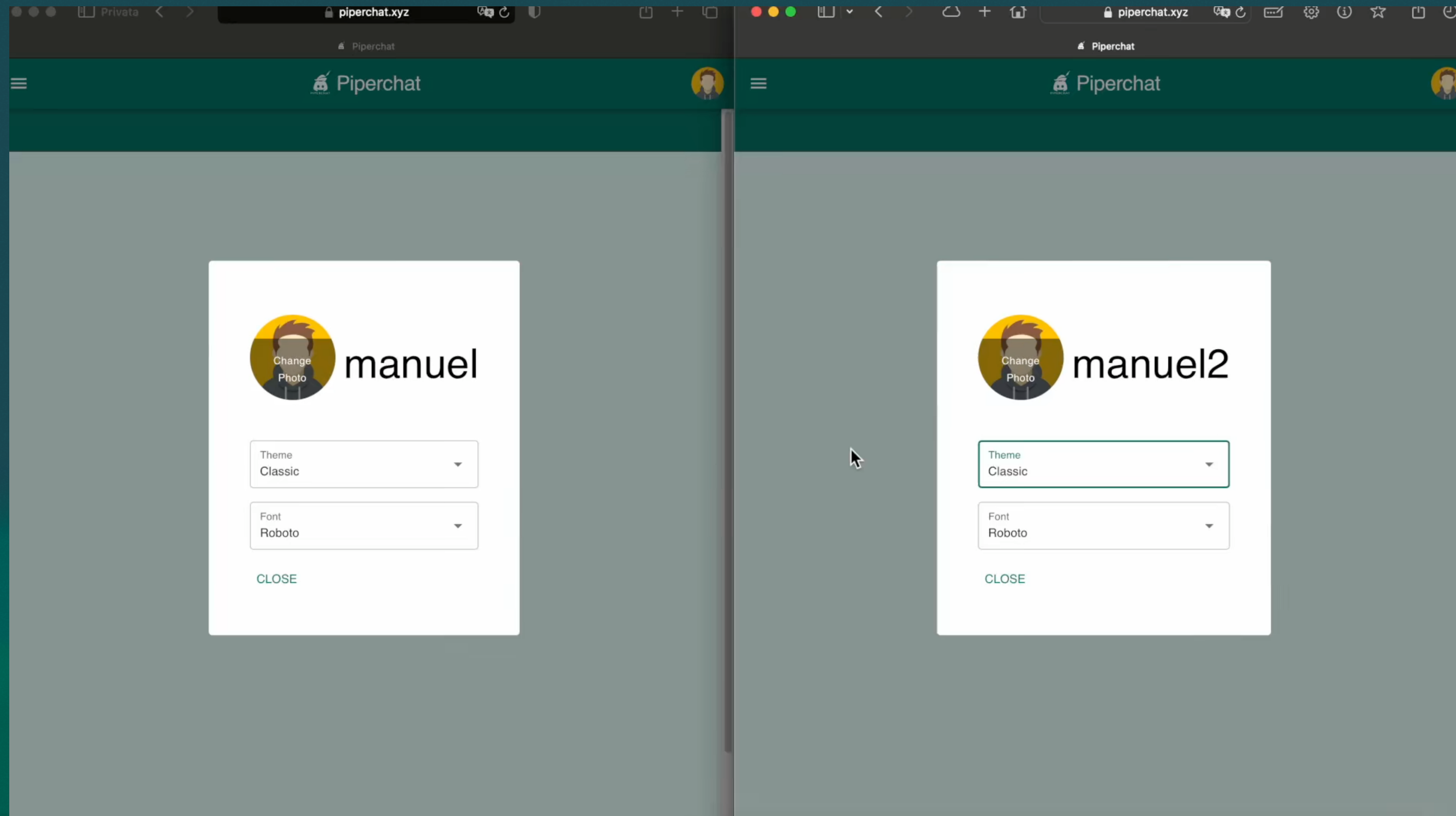
Username

Your password

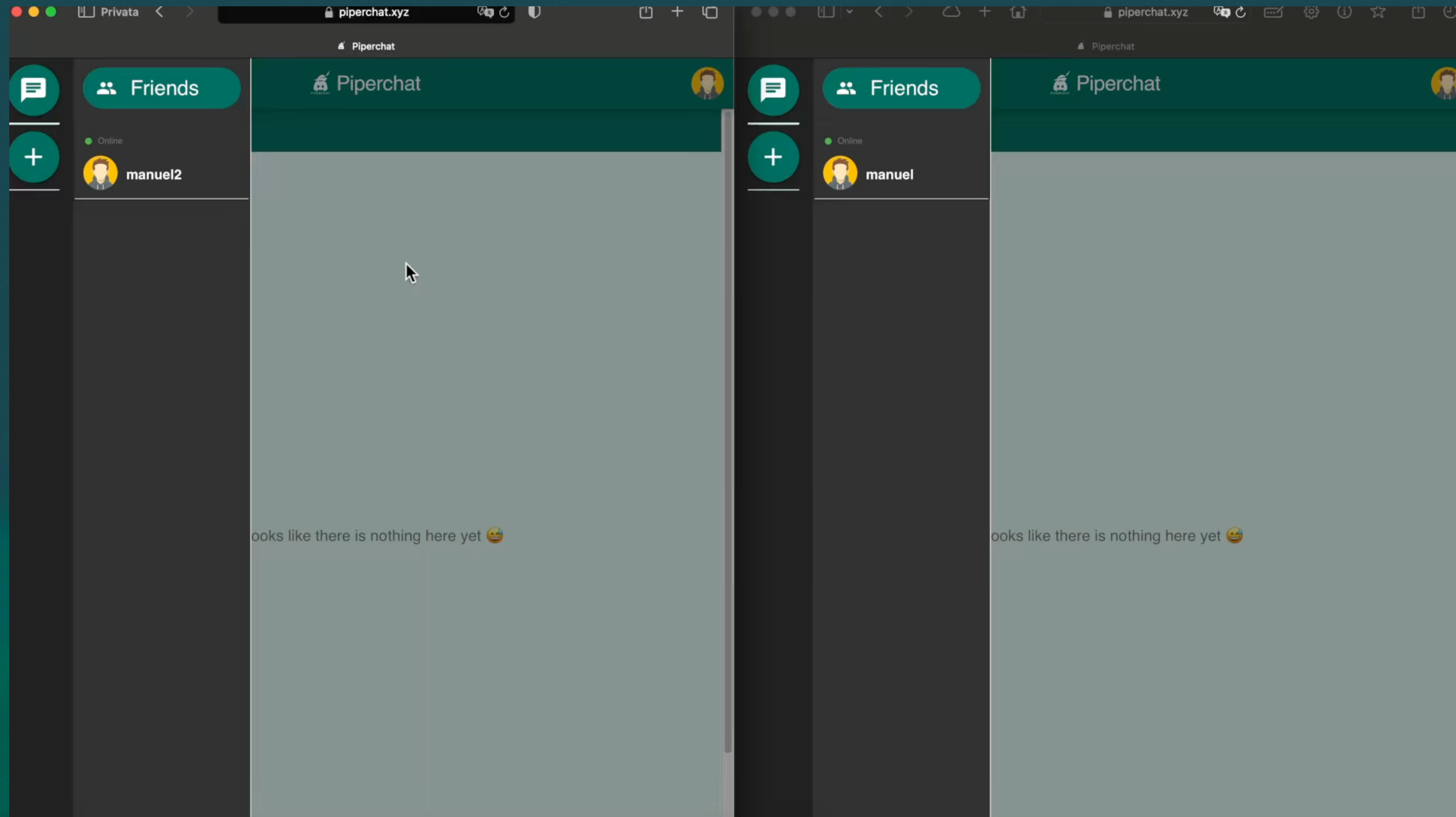
[New user? Register](#)

SUBMIT RESET

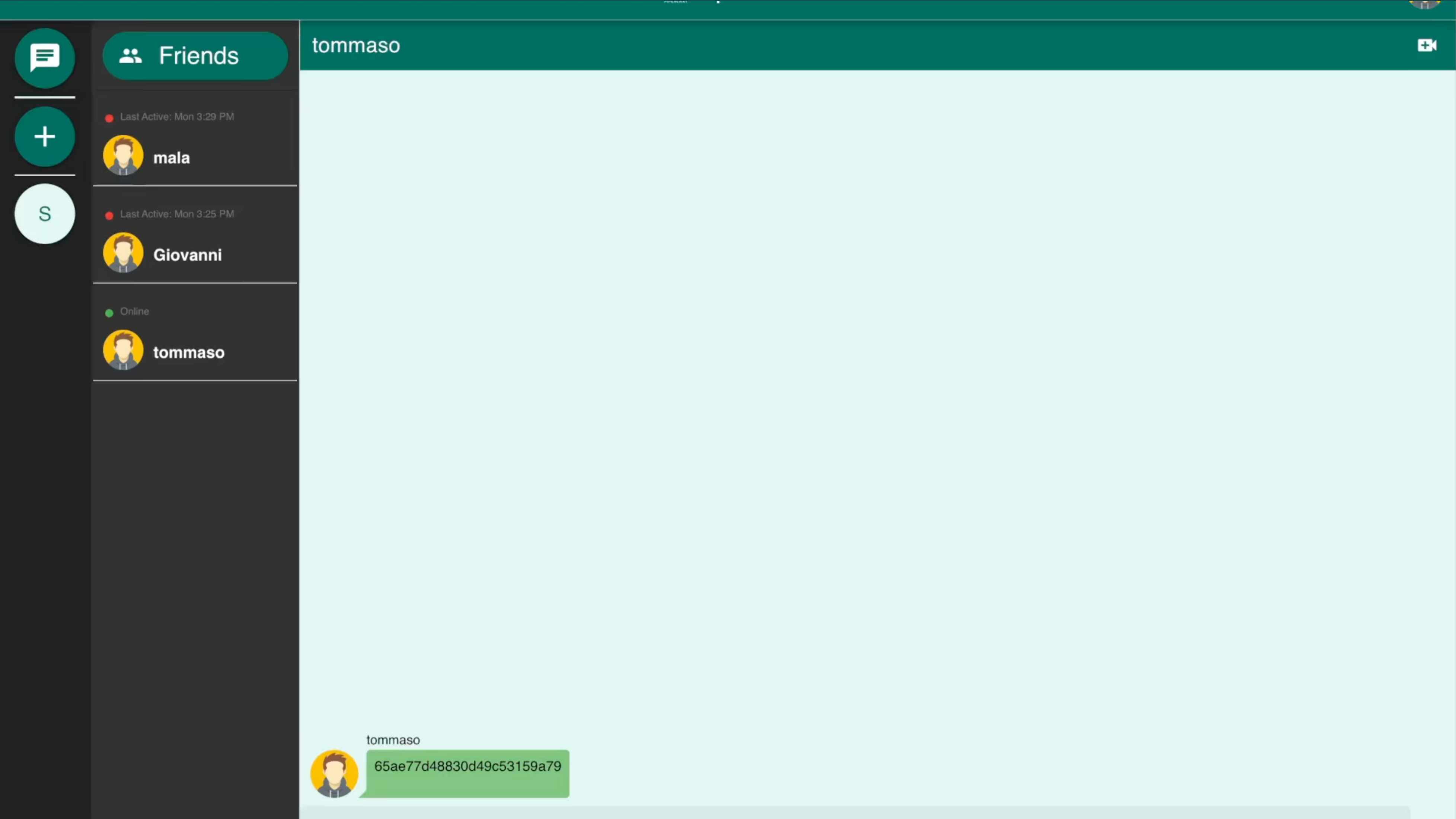
Richieste d'amicizia e messaggi



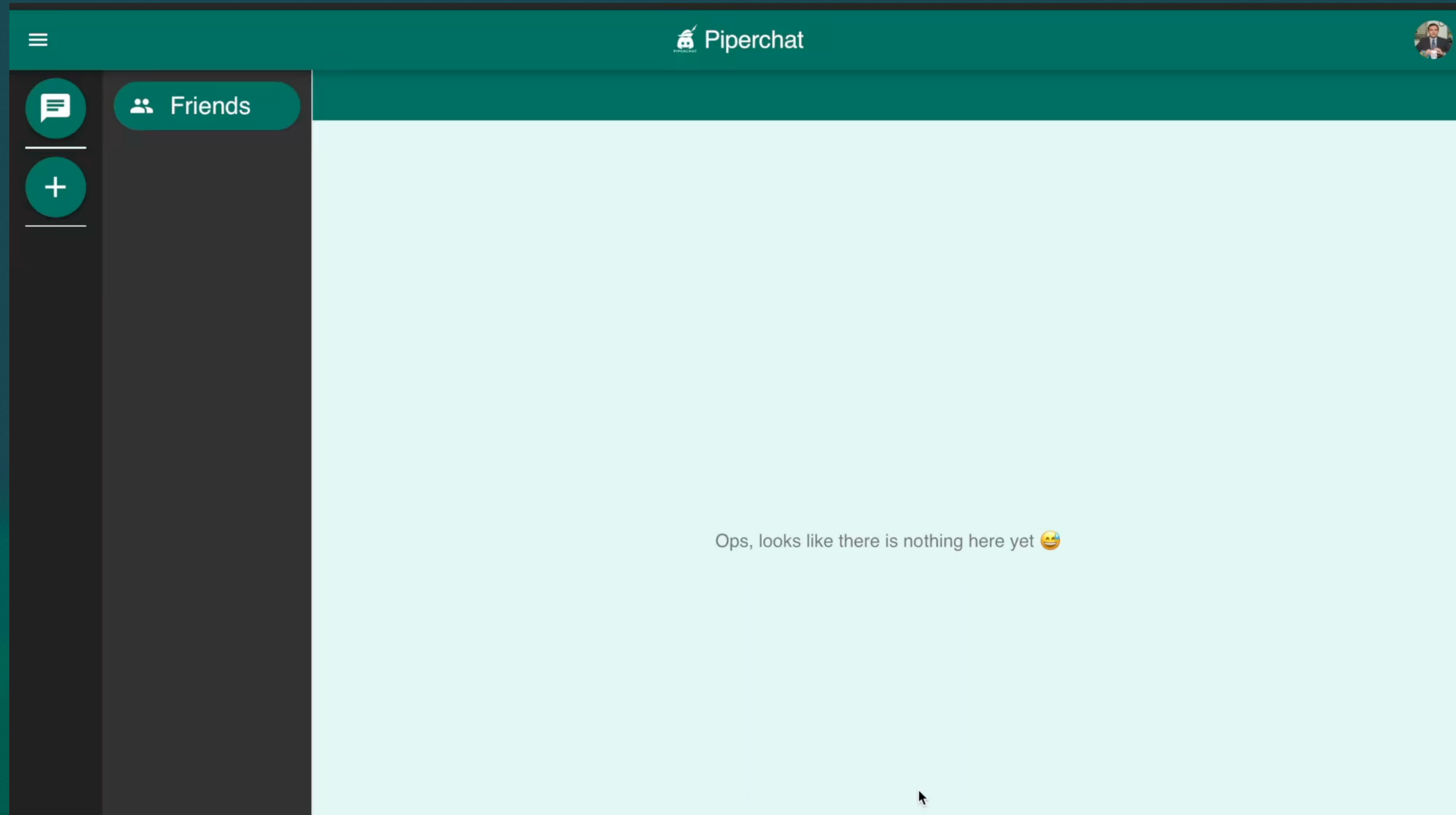
Messaggi fra utenti



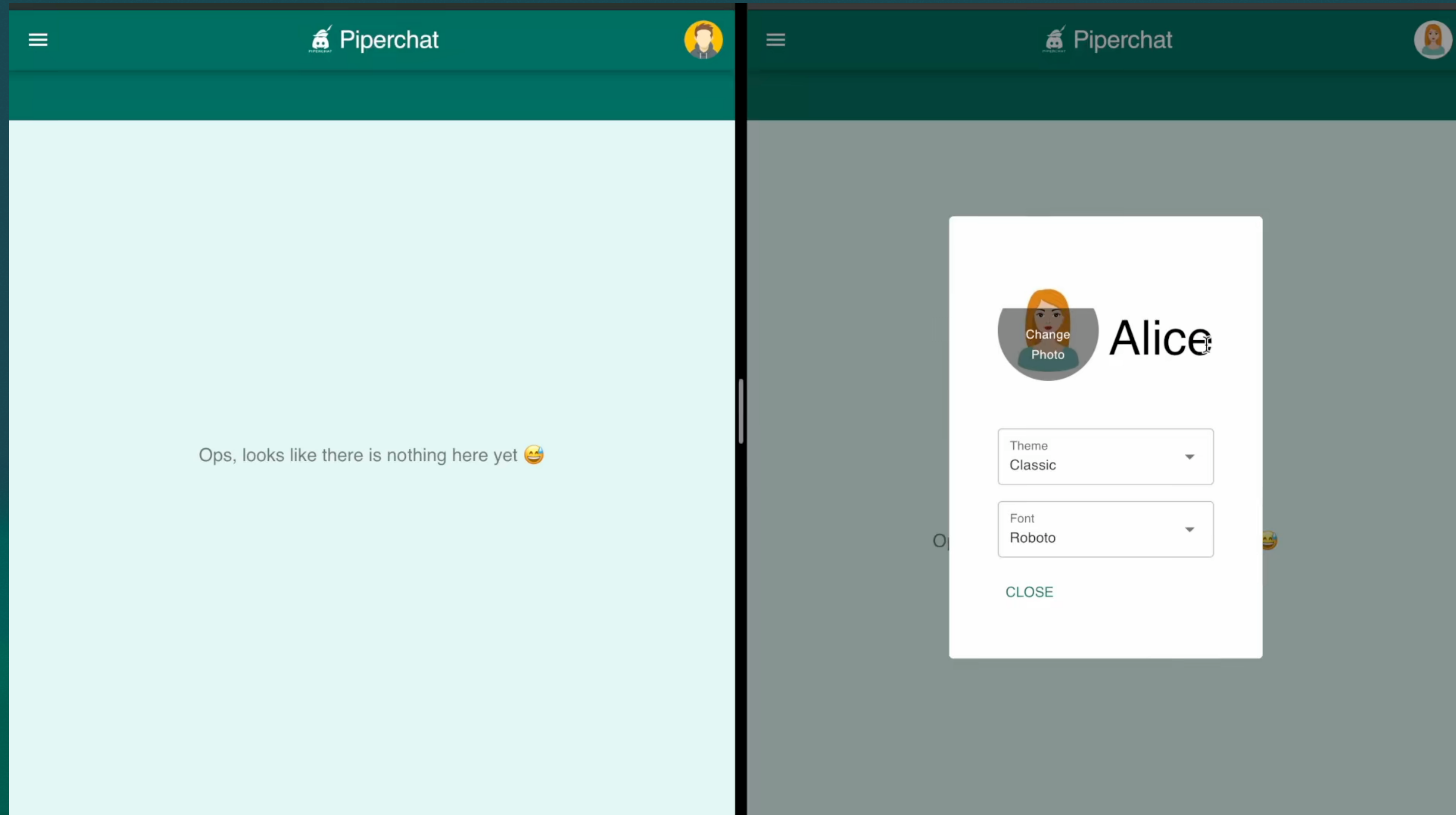
Chiamata fra utenti



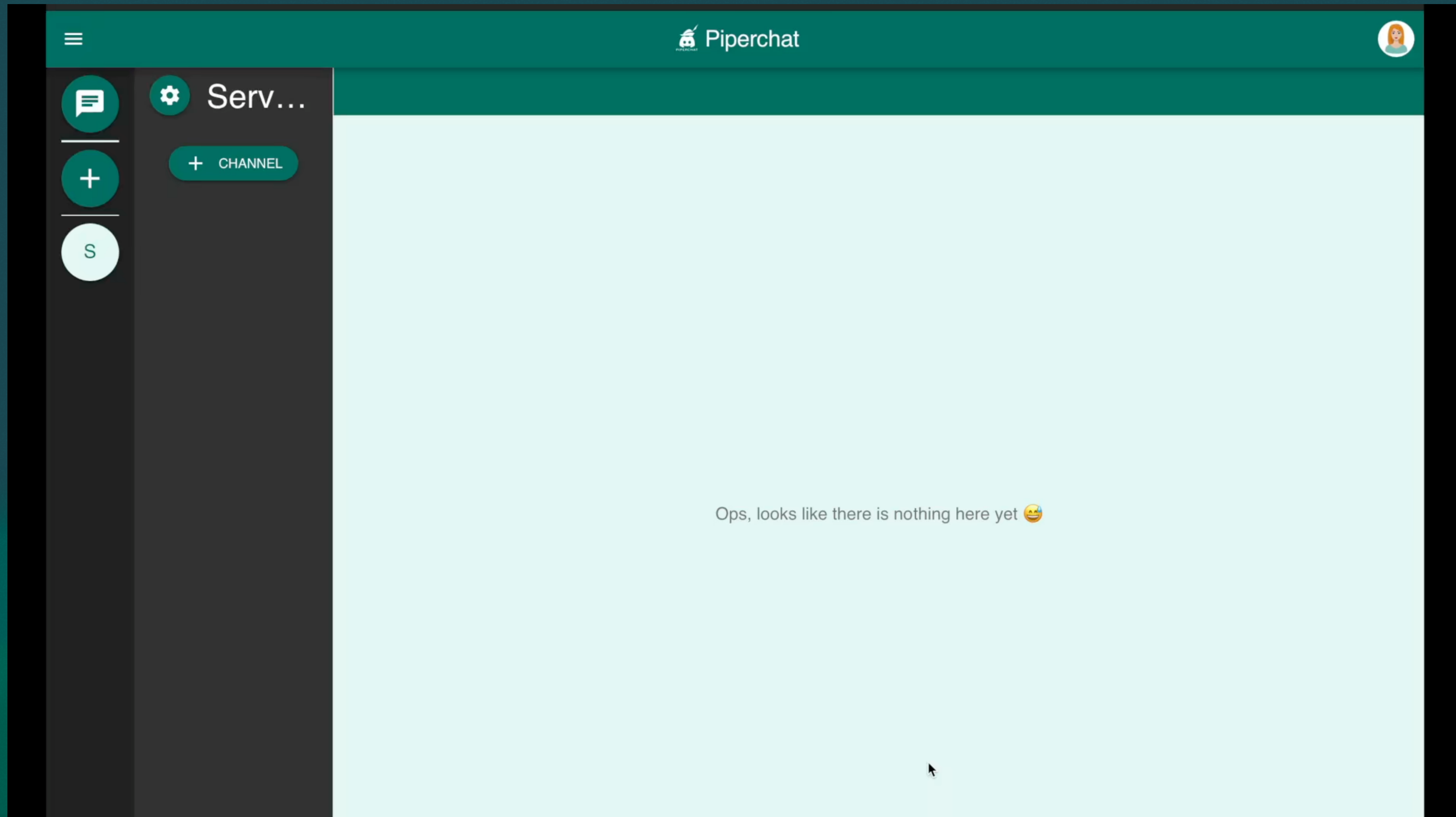
Impostazioni utente



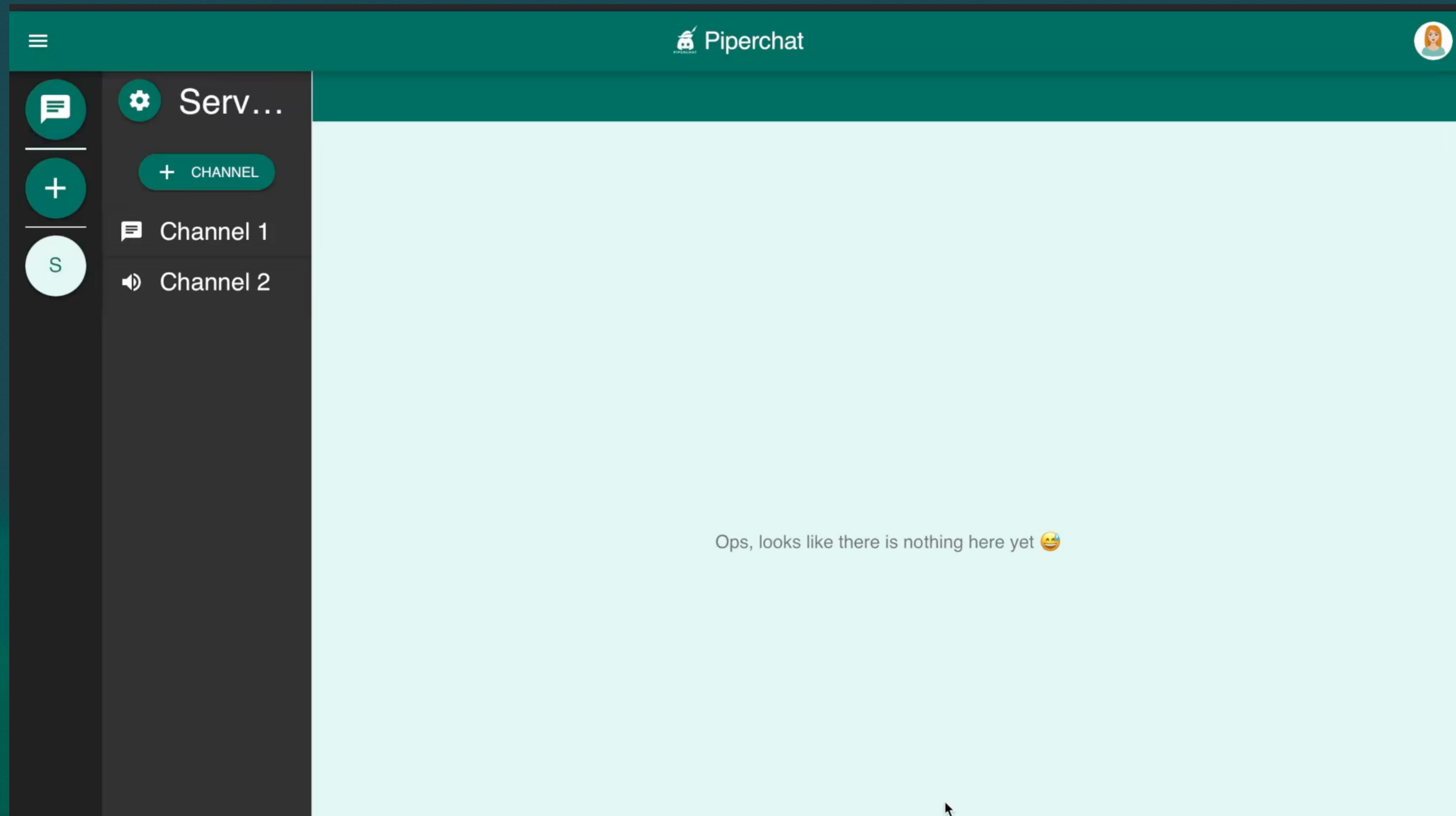
Creazione server e join utente



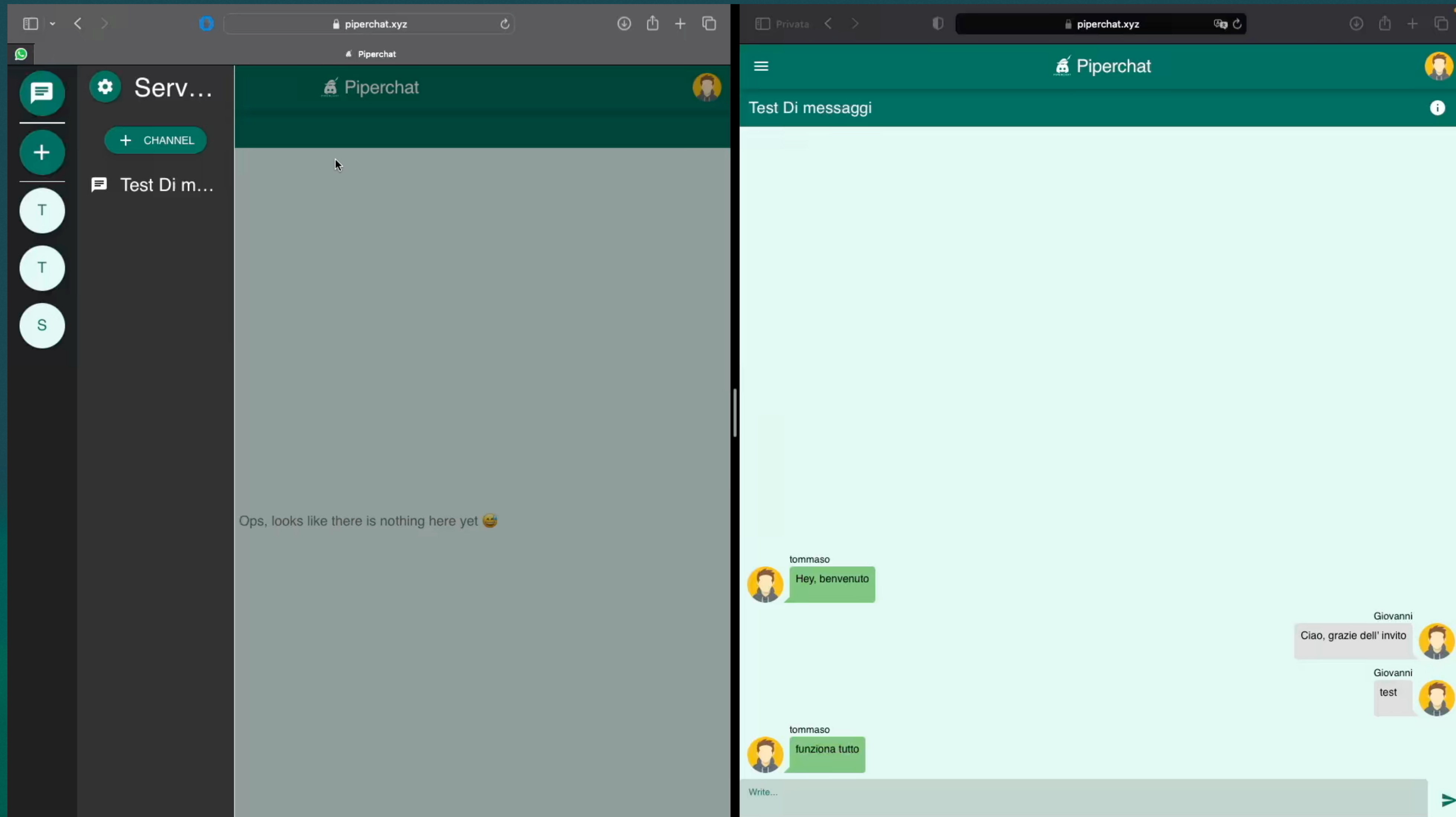
Creazione canali



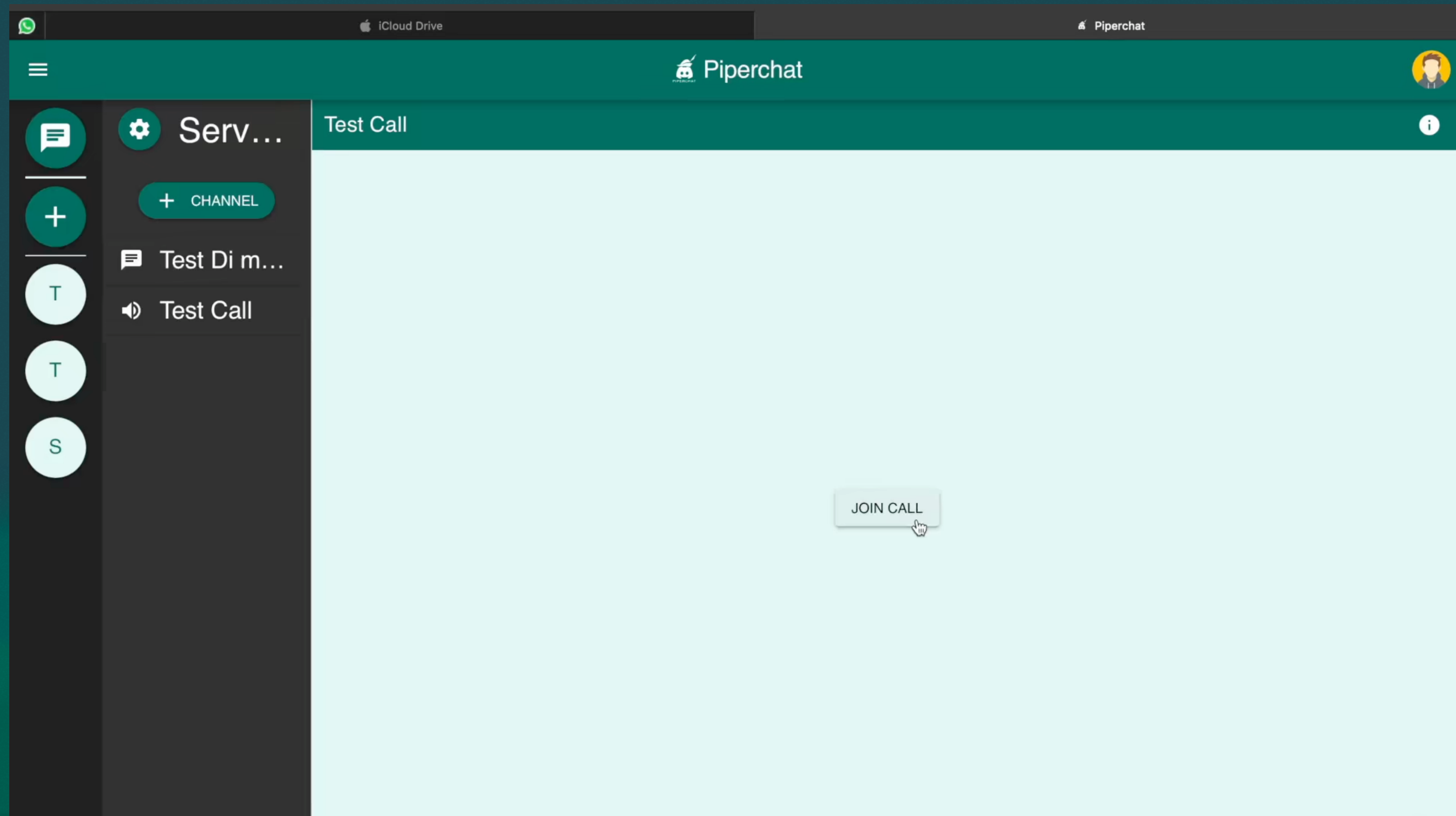
Impostazioni server/canali



Messaggi in canali



Chiamate in canali



Monitoring

Piperchat/monitoring

http://users:3000

Status: online

Timestamp: 2024-01-22T14:08:58.067Z

http://messages:3000

Status: online

Timestamp: 2024-01-22T14:08:58.106Z

http://piperchat:3000

Status: online

Timestamp: 2024-01-22T14:08:58.112Z

http://multimedia:3000

Status: online

Timestamp: 2024-01-22T14:08:58.125Z

http://notifications:3000

Status: online

Timestamp: 2024-01-22T14:08:58.134Z

Search

Only running

	Name	Ima...	↑	Status	Actions
☐	 a193fa141fa9 				
☐	 db-multimedia-service-1 	mongo		Running	  
☐	 db-users-service-1 	mongo		Running	  
☐	 db-notifications-service-1 	mongo		Running	  
☐	 notifications-service-1 	piperchat		Running	  
☐	 piperchat-service-1 	piperchat		Running	  
☐	 frontend-service-1 	piperchat		Running	  
☐	 users-service-1 	piperchat		Running	  
☐	 monitoring-service-1 	piperchat		Running	  
☐	 multimedia-service-1 	piperchat		Running	  
☐	 messages-service-1 	piperchat		Running	  
☐	 broker-1 	rabbitmq:3		Running	  
☐	 gateway-1 	traefik:v2.1		Running	  
☐	 inspector-1 	ubuntu:late		Running	  

Showing 18 items

Il Team



Manuel Andruccioli

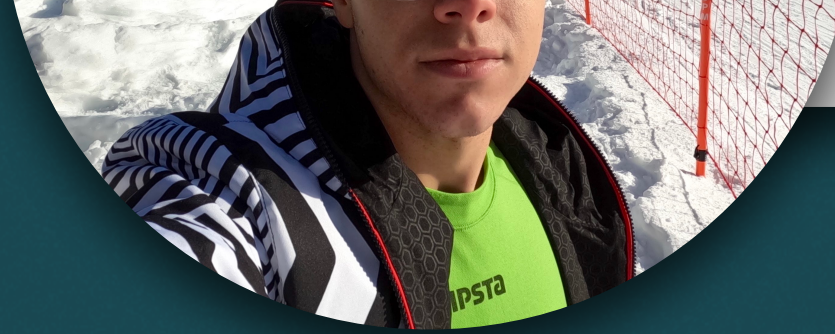
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Grazie per l'attenzione