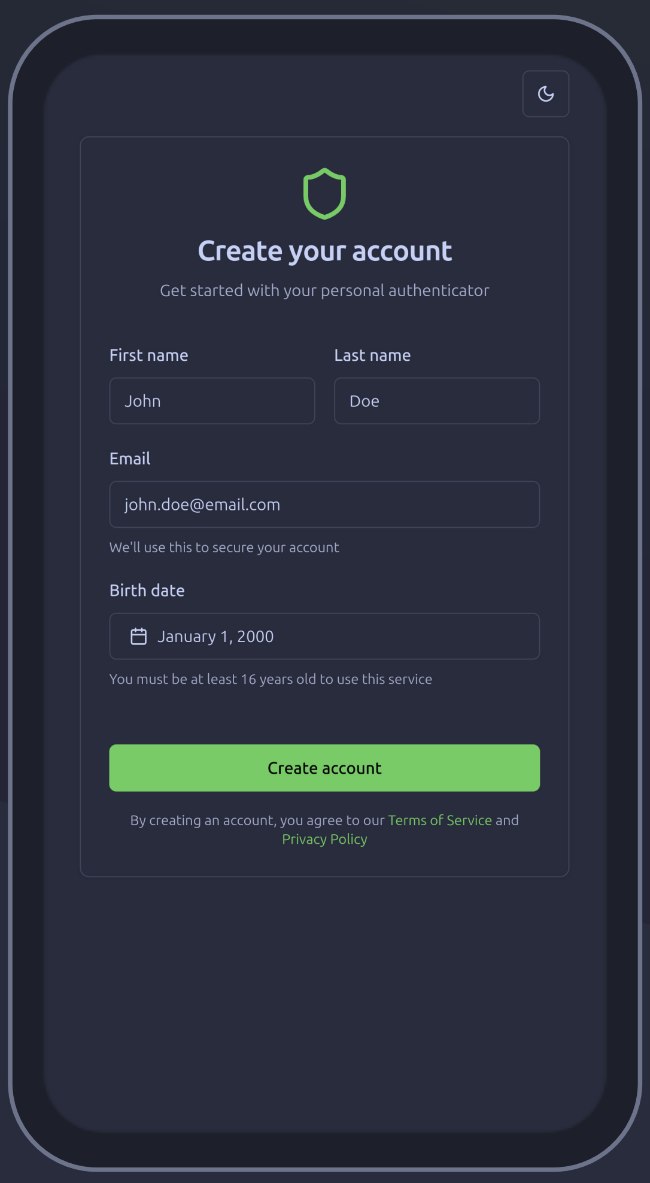
BYTESTRING

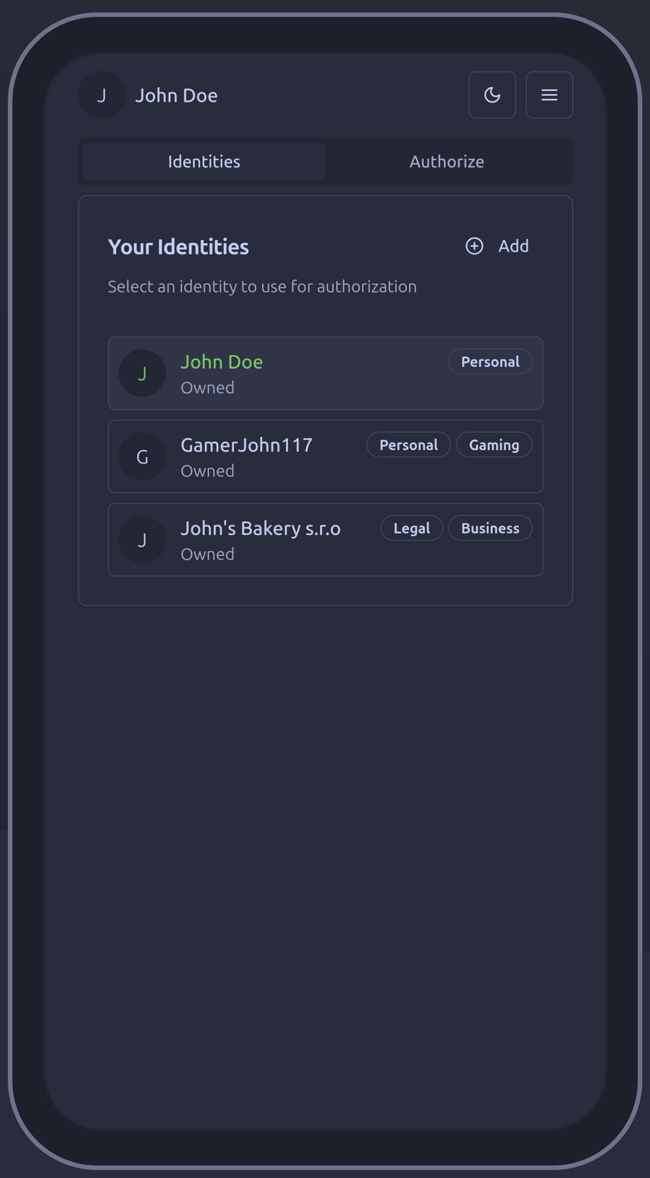
Gatekeeper

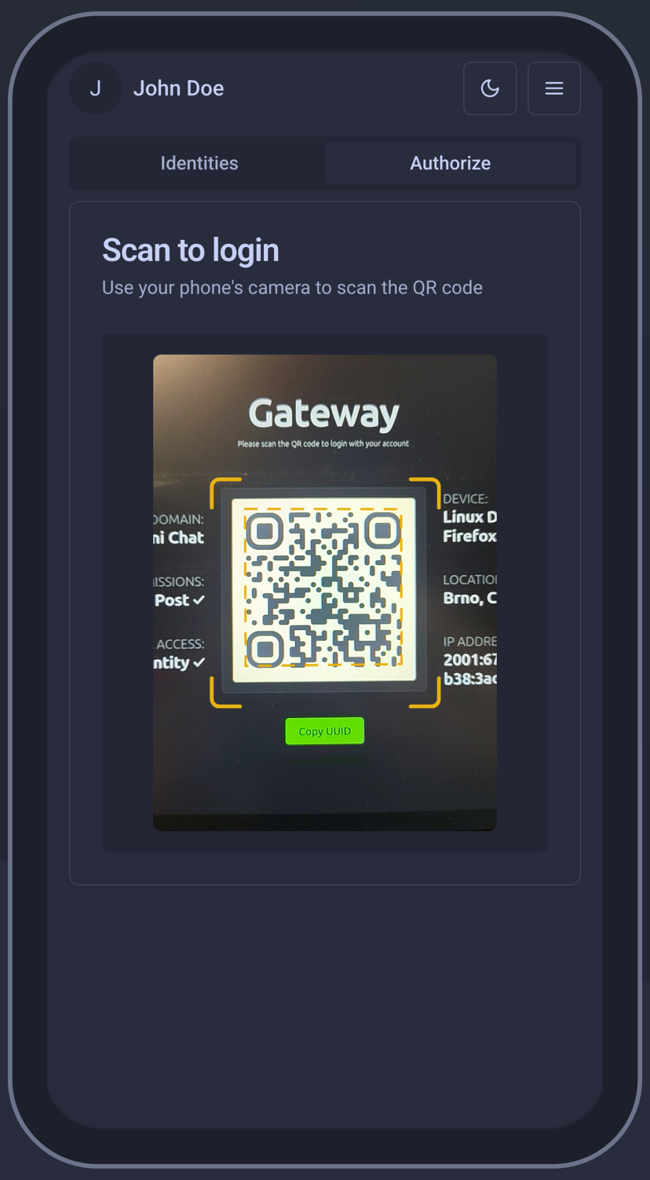
Passwordless Account solution as REST API

Tired of juggling **dozens of accounts** across different platforms? Are you **reusing passwords**, managing them with third-party tools, or trying to follow best practices with **unique credentials** for every service? Either way, it's messy — and maintaining good **personal security** becomes a serious challenge.
But what if you didn't need passwords at all?

Introducing **Gatekeeper** — a streamlined account solution designed to **overhaul the login process**, simplify authentication, strengthen security, and bring unified identity management to your next big application, all while being **easy to implement** as simple REST API.


Create your account
Get started with your personal authenticator
First name: John
Last name: Doe
Email: john.doe@email.com
We'll use this to secure your account
Birth date: January 1, 2000
You must be at least 16 years old to use this service
Create account
By creating an account, you agree to our Terms of Service and Privacy Policy


John Doe
Identities | Authorize
Your Identities — Add
Select an identity to use for authorization
John Doe — Owned — Personal
GamerJohn117 — Owned — Personal, Gaming
John's Bakery s.r.o — Owned — Legal, Business


John Doe
Identities | Authorize
Scan to login
Use your phone's camera to scan the QR code

One Account to rule them all

Users create a single Account using their verified personal information. However, this information is not used for authentication. Instead, users can generate multiple profiles, each linked to their main account and tailored for specific use cases.

These profiles can represent a real-name presence for personal interactions, a pseudonymous handle for social media, or a legally verified entity for business purposes. Each profile operates independently, allowing users to separate contexts while remaining anchored to a single, secure account.

Profiles can also be selectively shared with others, with fine-grained permission controls that define exactly who can access what.

Passwordless by Design

The login process is entirely passwordless. Instead, each account is bound to a cryptographic key pair based on the Ed25519 standard, with the private key securely stored on the user's mobile device.

When logging in, the user scans a QR code containing the identifier of the Gateway. The mobile device retrieves the corresponding Gateway data, hashes it, and signs the hash using the private key. This signature is then sent to the Gatekeeper server.

The Gatekeeper validates the signature by retrieving the matching public key from its database, ensuring both authenticity and integrity — all without ever transmitting a password.

1 Gateway Creation

Your server creates a secure login Gateway through our API when a user attempts to log in. Instead of serving users a login form, you redirect them to our Gateway portal.

- ✓ Secure endpoint
- ✓ MFA by design
- ✓ Privacy focused

flask python

```python
# Use the API to create new gateway for this login
response = requests.post(
    "https://accounts.bytestring.net/v1/gateway",
    json = {
        # Provide our secret API token
        "key": API_KEY,
        "data": {
            # Provide as much information as you can about the user
            "metadata": {
                # You can get this from user agent
                "device": device, "os": os, "browser": browser,
                # You can get this from the headers
                "ip": visitor_ip,
                # You can use geolocation API for this
                "location": location,
            },
            # Specify what data you need from the user
            "requirements": { "username": True },
            # This is what the new session will be authorized to do
            # in our application. It is our responsibility to enforce it.
            "permissions": { "post": True },
            # This is where we want our user to be redirected
            "redirect": "https://chat.bytestring.net/login/gateway",
        }
    }
).json()

# Redirect the user to the new gateway portal
return redirect(
    "https://client.bytestring.net/gateway?uuid=" +
    str(response["gateway"])
)
```

2 QR Code Authorization

Users scan the QR code displayed on the Gateway page using our secure mobile app. This initiates a secure authentication process where our server and the client's phone perform an asymmetric encryption handshake to verify the login attempt.

- ✓ Instant QR login
- ✓ Passwordless verification
- ✓ Cryptographic signature

flask python

```python
# User is redirected back to this route where we finish his session
@app.route("/login/gateway/", methods=["GET"])
def login_gateway():

    if "unverified" in session:
        # Get the gateway_id from the current session
        gateway_id = session["unverified"]

        # Fetch his data from the API
        fetched_gateway = requests.post(
            "https://accounts.bytestring.net/v1/gateway/session",
            json = {
                # Provide our secret API token
                "key": API_KEY,
                "data": {
                    # Ask for specific gateway
                    "gateway": gateway_id
                },
            }
        ).json()

        # Get the username from the gateway and save it
        session["user"] = fetched_gateway["username"]
        return redirect("/")

    # Do nothing if user triggered this route through URL
    return redirect("/")
```

Try out live demo!

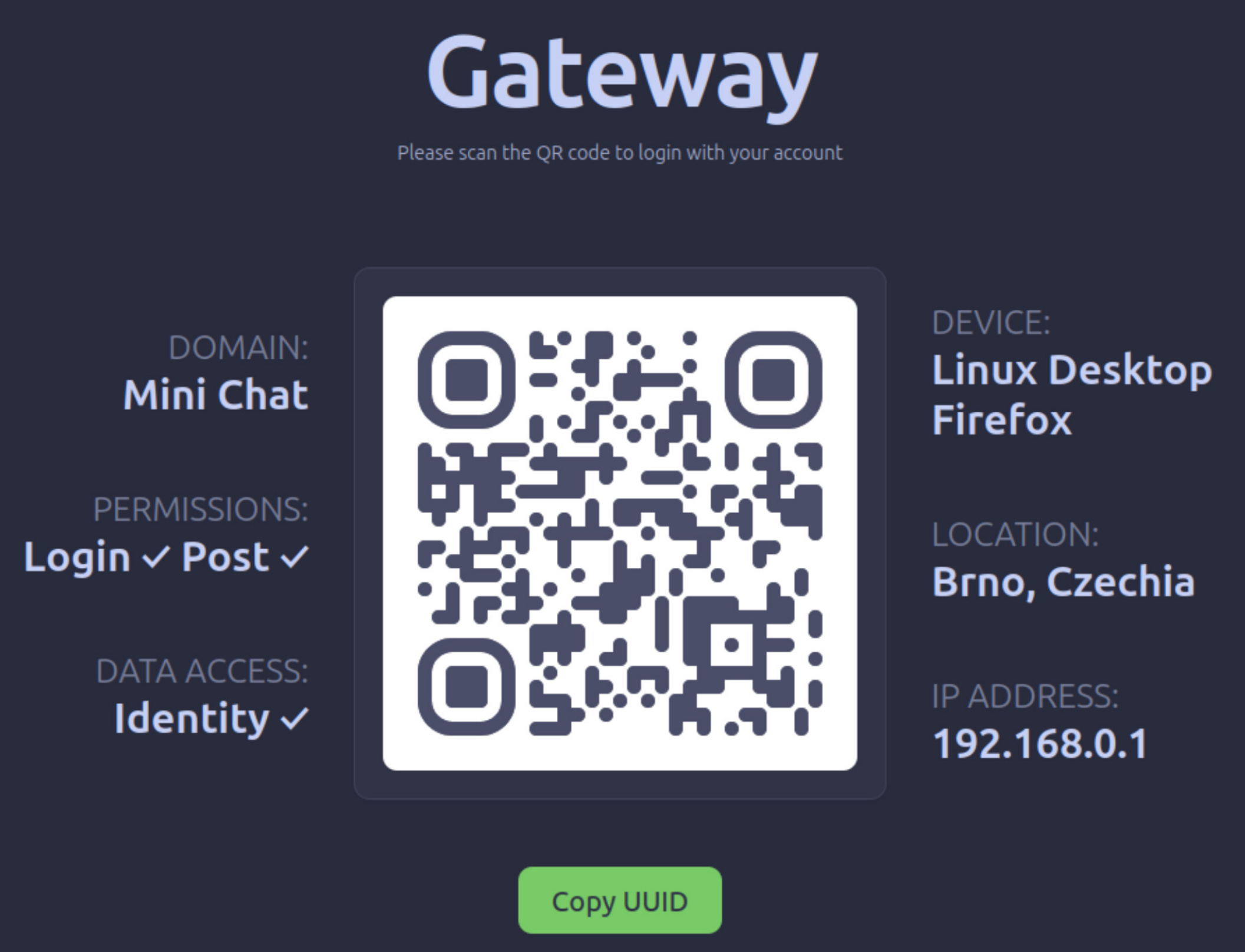
Temporary mobile application on the web:
https://app.bytestring.net

Testing website written in Python Flask:
https://demo.bytestring.net

3 Seamless Return

Users are automatically redirected back to your application once the Gateway is processed. You can then securely fetch the authenticated user's data from our server using your API credentials.

- ✓ Centralized authority
- ✓ Secure data retrieval
- ✓ Information verification


Gateway
Please scan the QR code to login with your account

DOMAIN: Mini Chat	DEVICE: Linux Desktop Firefox
PERMISSIONS: Login ✓ Post ✓	LOCATION: Brno, Czechia
DATA ACCESS: Identity ✓	IP ADDRESS: 192.168.0.1

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Bytestring.net
Dominik Kaspar, 2025
Self-Directed Independent project