REST identity and access management

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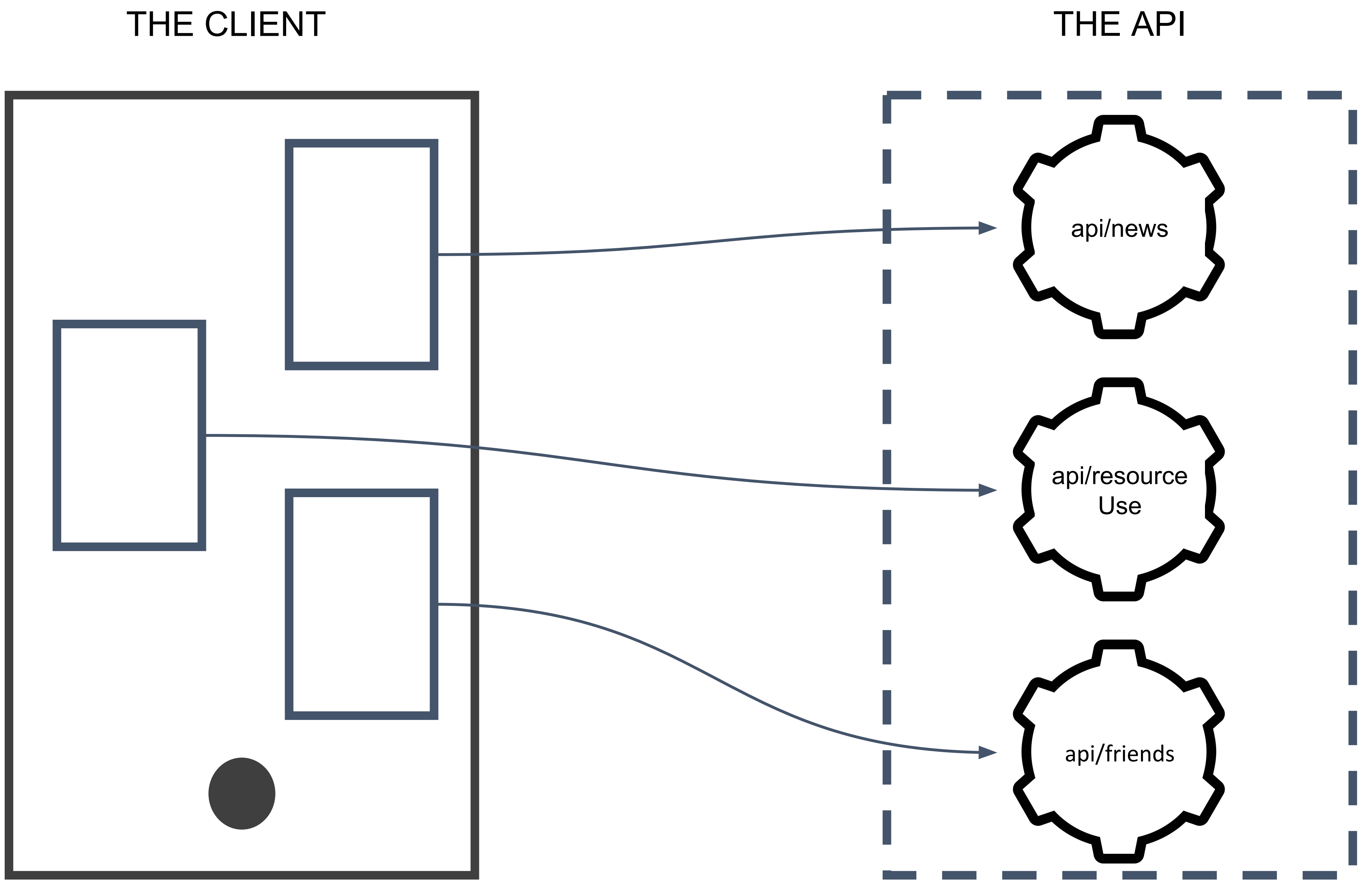
Case study

You are the developer of a social network for hackers set up by an ISP.

The client retrieves information from the ISP’s back-end APIs.

THE CLIENT
THE API
api


THE CLIENT
THE API
api/news
api/resource
Use
api/friends

Demo: API with Azure Functions

- Create function app
- Add function to the app which returns a news item

Challenge: approved clients only

Solution: shared API key

- Not natively possible in the function app, so we use an API manager
- The API manager validates the API key

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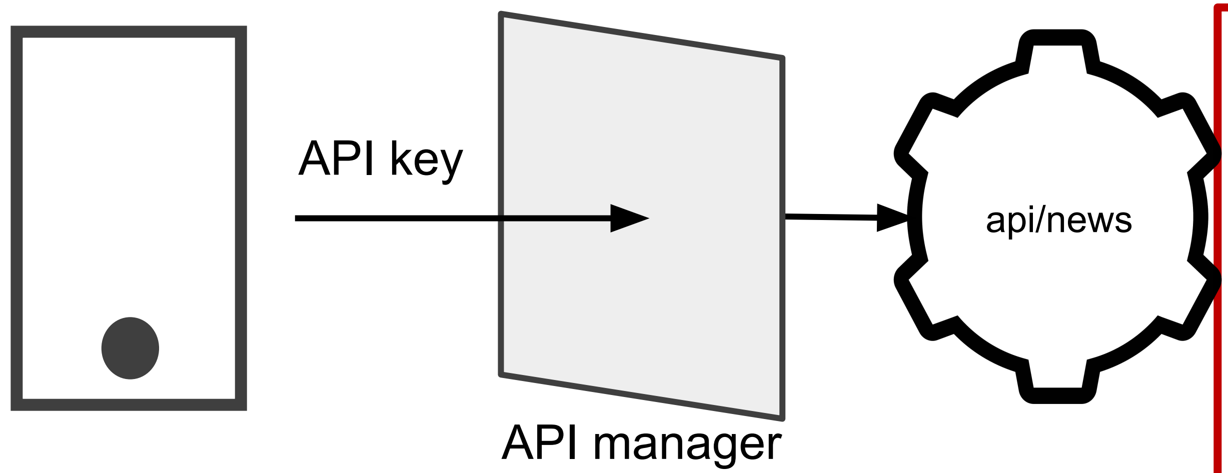

It works! Yippee! But...

- What if multiple apps consume the API?
- How to securely distribute the API key?
- Can news be personalized?
- How to revoke/limit access in time?

Challenge: finer grained access control

Solution: access tokens!

- The API manager validates the incoming token

The access token

- Typically a JWT
- Signed by
  - the STS
  - the issuer
  - the authorization server
- Contains some useful claims (exp, sub, iss, aud)

Challenge: finer grained access control

Solution: access tokens!

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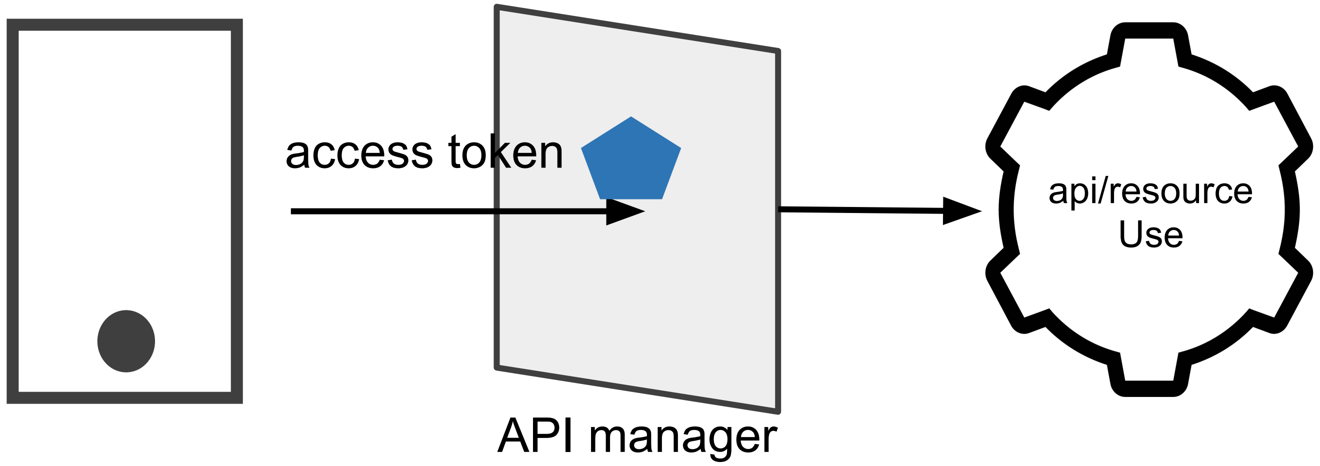
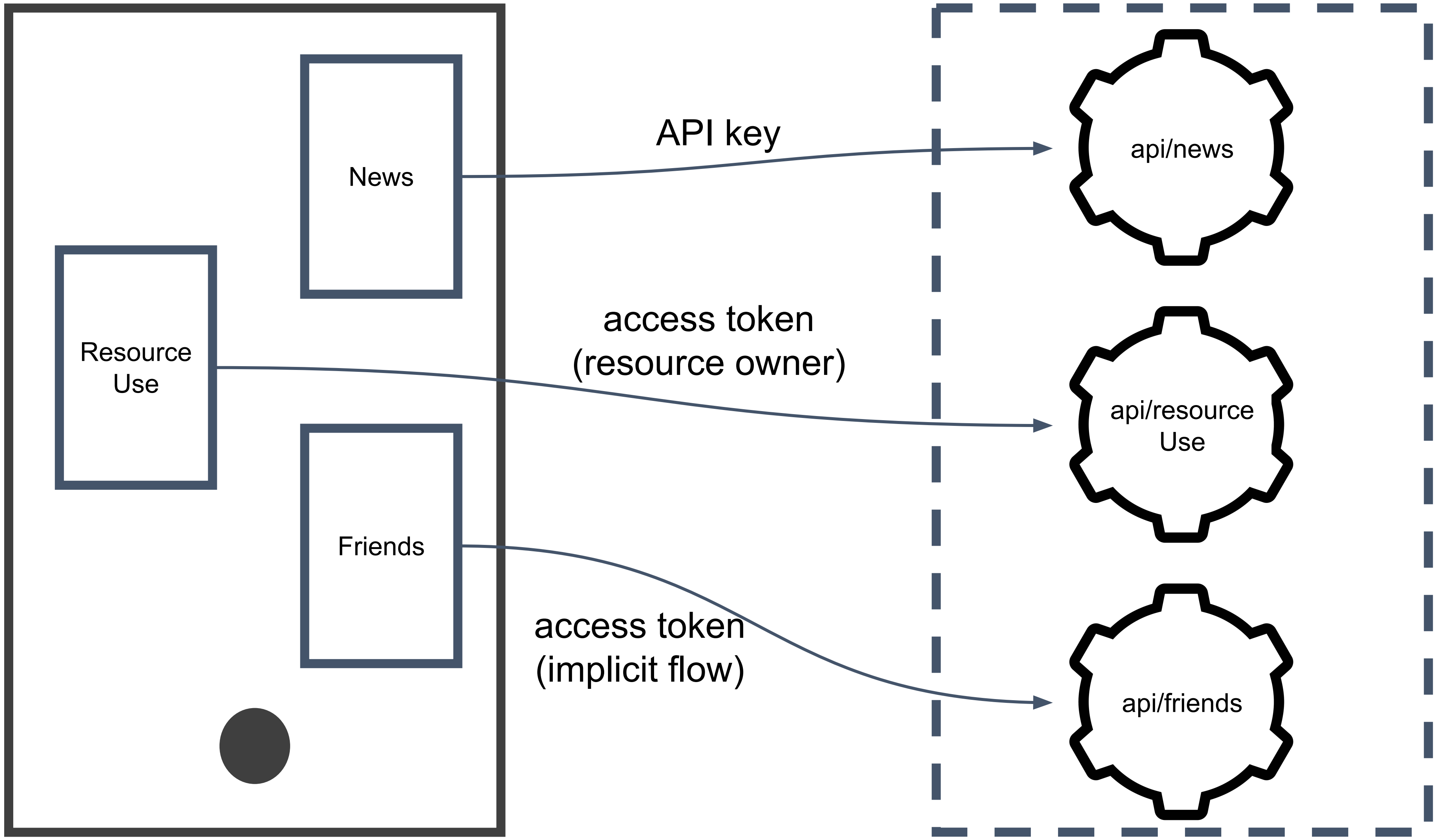


It works! Yippee! But...
where did the token come from?

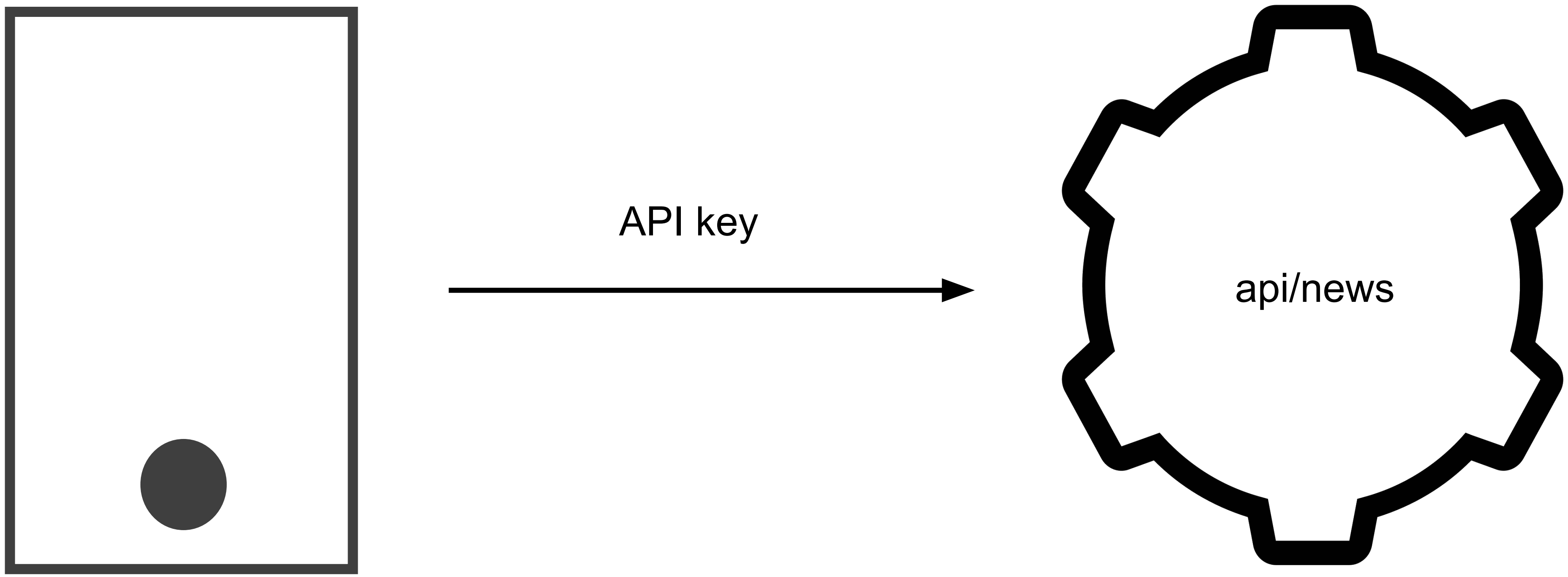

News
Resource Use
Friends
API key
access token (resource owner)
access token (implicit flow)
api/news
api/resource Use
api/friends

Demo: React SPA

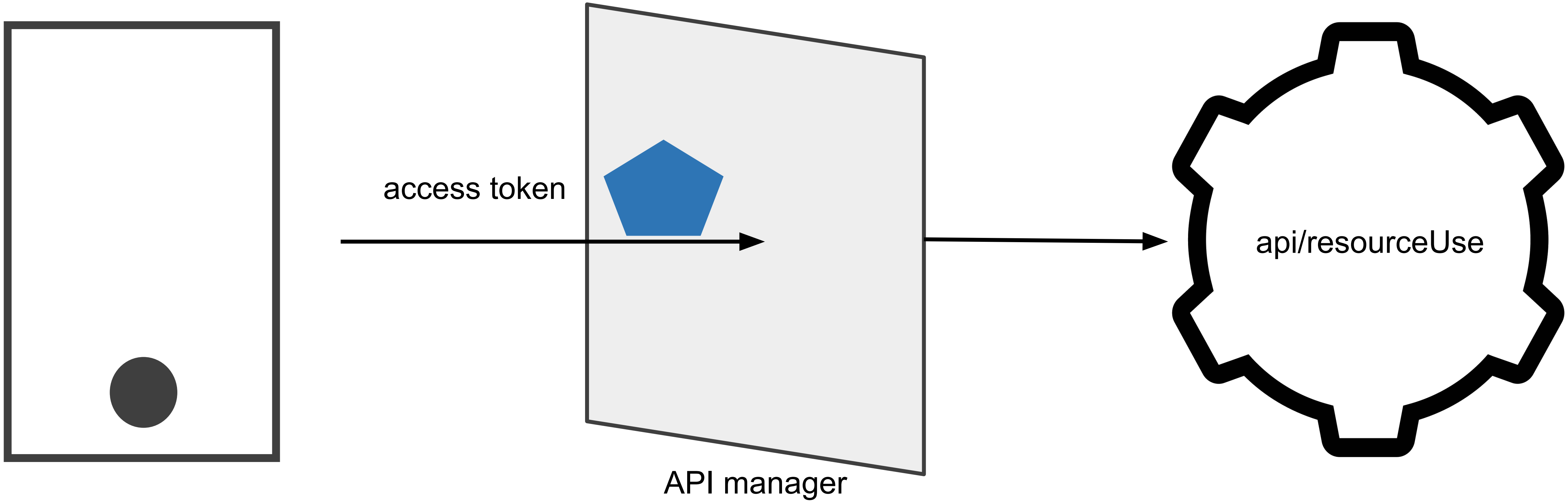
```
npx create-react-app react-rest-client
npm i auth0-js axios react-bootstrap
```

and add components

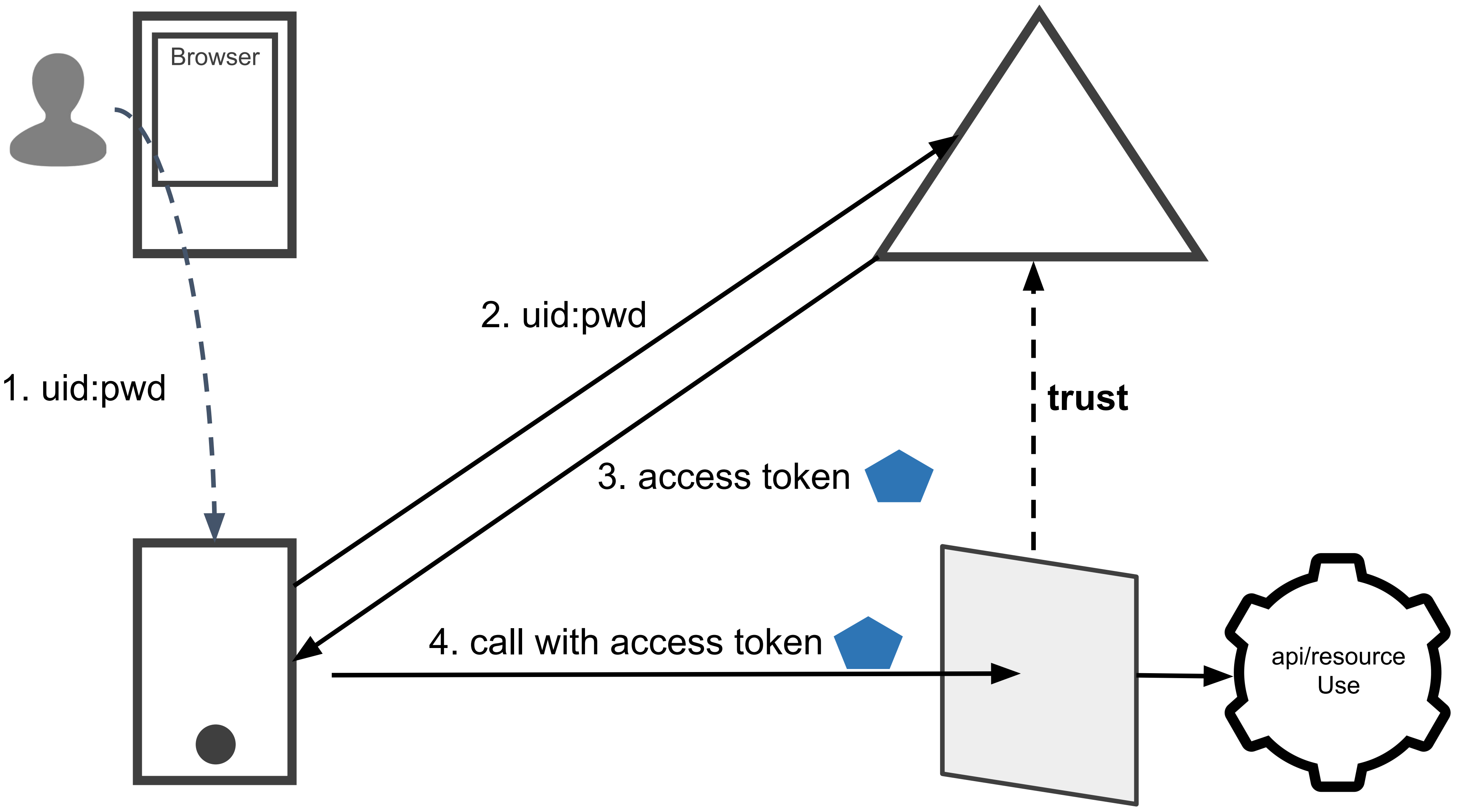
React Component 1: News



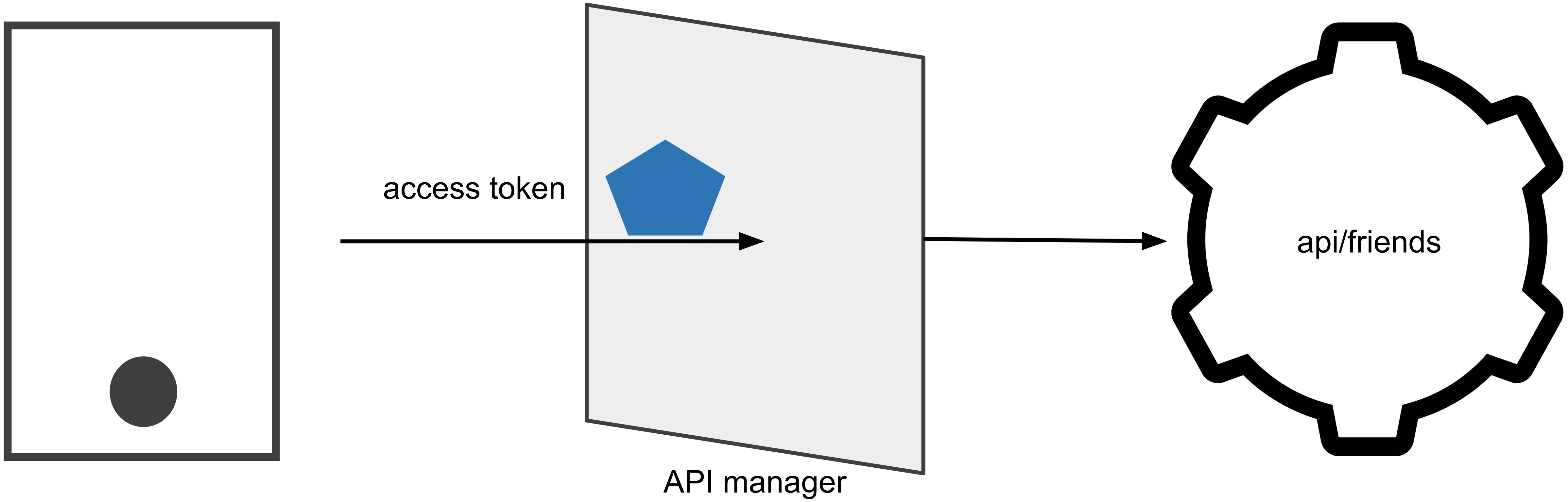
React Component 2: ResourceUse



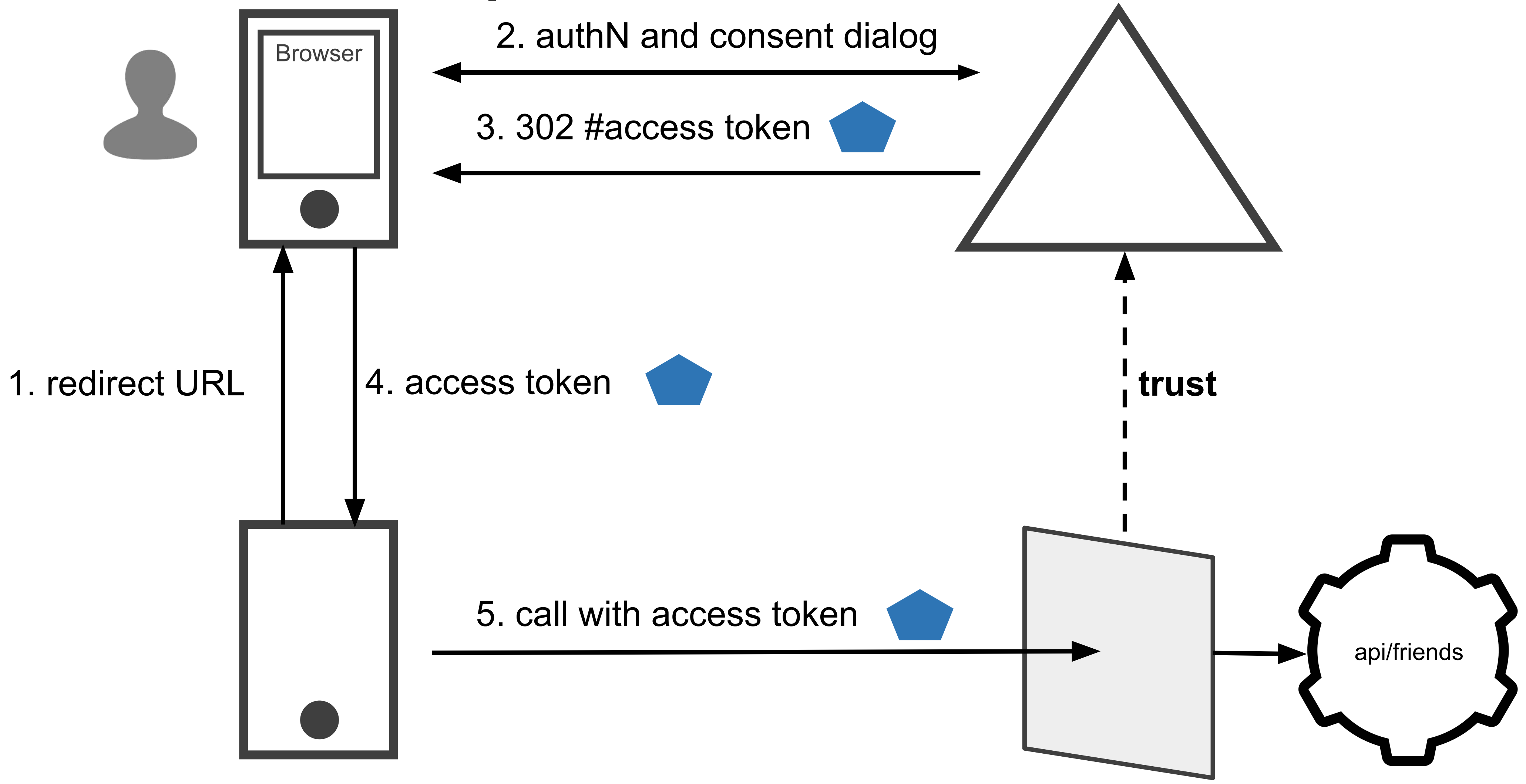
Obtaining an access token with a password



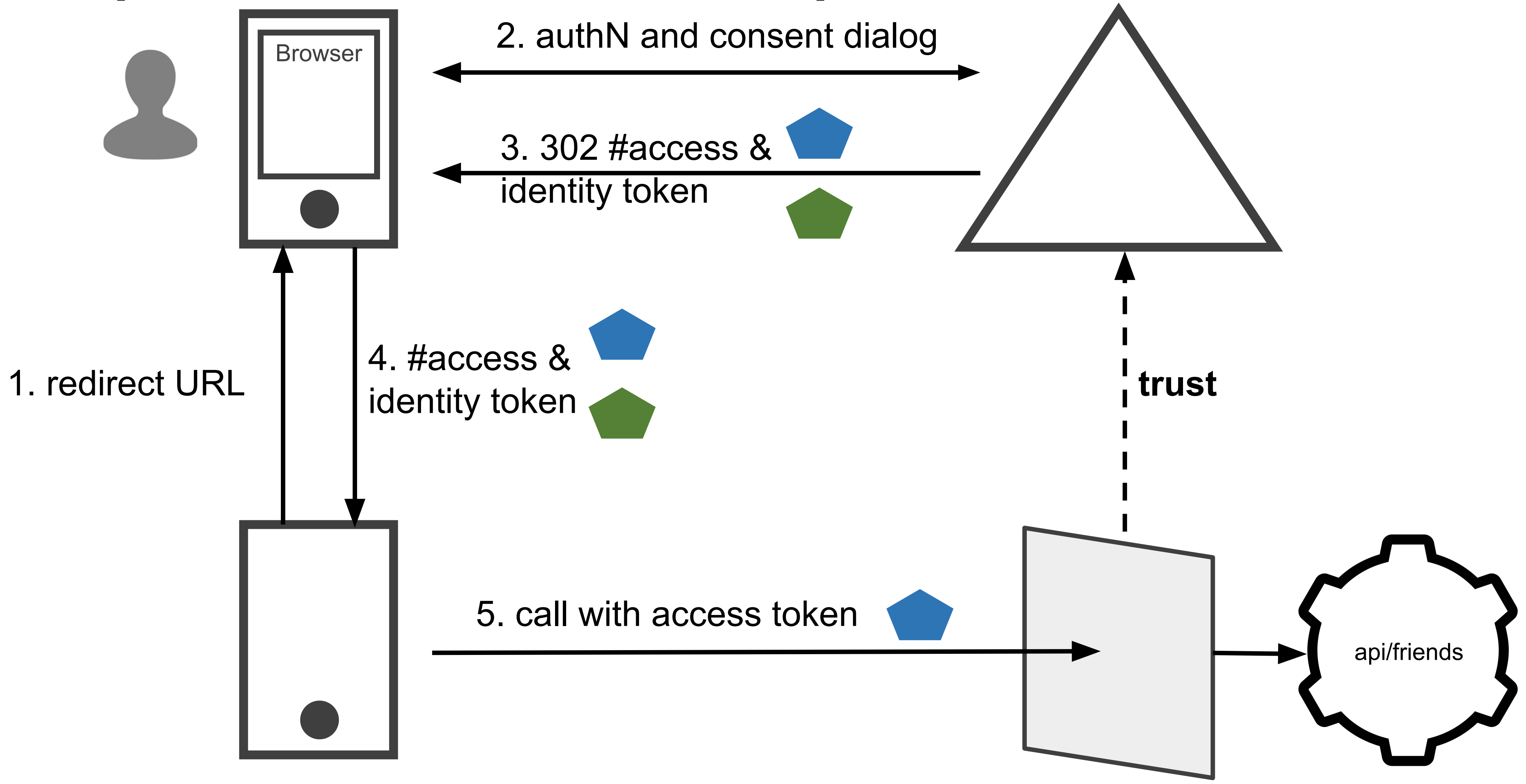
React Component 3: Friends



OAuth 2 Implicit Grant

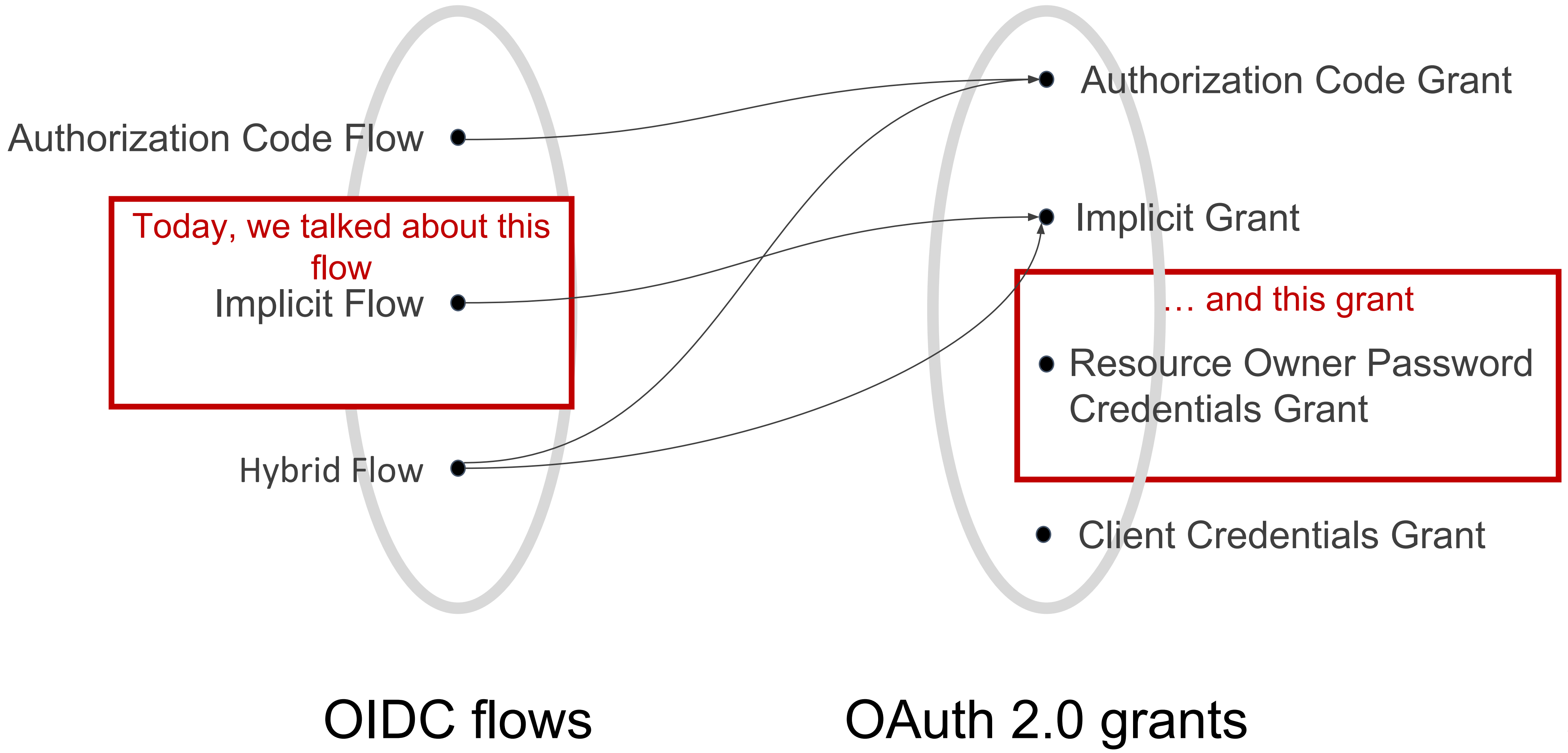


OpenID Connect Implicit Flow



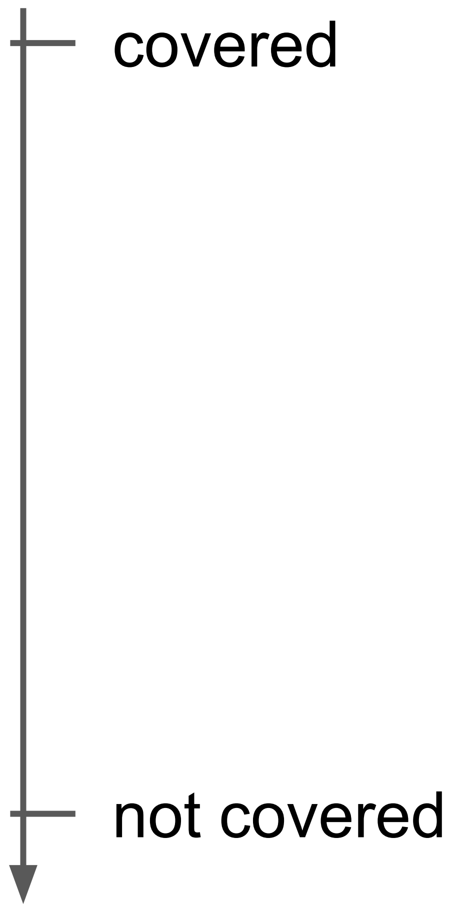
Browser
2. authN and consent dialog
3. 302 #access & identity token
1. redirect URL
4. #access & identity token
trust
5. call with access token
api/friends

More ways to obtain tokens



Architectural considerations

- Create choke points AKA principle of complete mediation
- Separation of concerns
  - Application logic and authentication
  - Application logic and authorization AKA policy-based access control
- Stateless services
- Minimize resource reservation
- Trade off security against performance
- ...



Further topics

- Identity Management
- Access rules
- Access control models
- Authentication
- Fan out
- Call chaining

Resources

- https://github.com/JohanPeeters/react-rest-client
- https://github.com/Mich-b/ModernACREST.git
- https://github.com/JohanPeeters/REST-IAM-demo
- https://jwt.io
- https://developer.mozilla.org/en-US/docs/Web/HTTP/CORS
- https://tools.ietf.org/html/rfc6749
- https://openid.net/specs/openid-connect-core-1_0.html