Controlling Access with the Proxy Pattern

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Overview

Remote Proxy

Virtual Proxy

Protection Proxy

Smart Reference Proxy

DBMSs use them all!

Web servers and virtual proxies

Demo

Employee object

Sensitive information

- Birthdate
- Salary

AccessControl object

- Employee Ids
- Flag for personal information access

Client program to access employees

- Use AccessControl object

Proxy

Classification: Structural

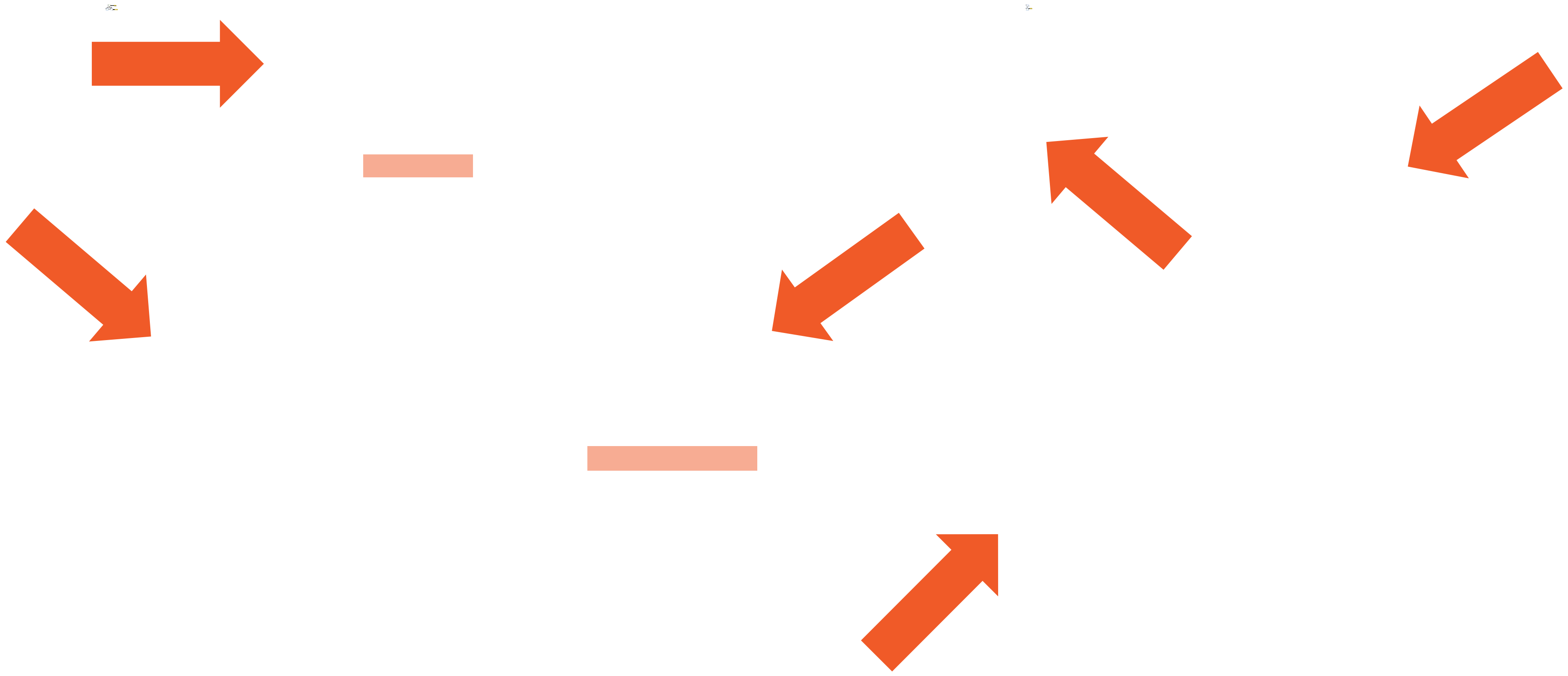
Acts on a real subject

Keeps a reference to the subject

Exposes an identical interface

Controls access to the real subject

Proxy Pattern Structure



Demo

Implement the Protection Proxy

Create:

- Subject Abstract Base Class
- Concrete Subject
- Proxy Subject, composed with it

Use a Factory to get the proxy

Test the solution

Consequences

Introduces a level of indirection

Protection proxy controls access

Virtual proxy and lazy instantiation

- @functools.lru_cache

Remote proxy hides communication details

- pyodbc for database access

Smart proxy can add housekeeping

- Locking

Open/closed principal

Prefer composition over inheritance

Summary

When is the Proxy Pattern applicable?

Add controls to an object

Obey the Open/Closed principle

Proxies can be used in combination