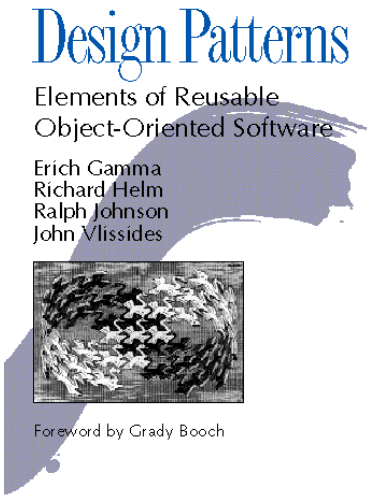
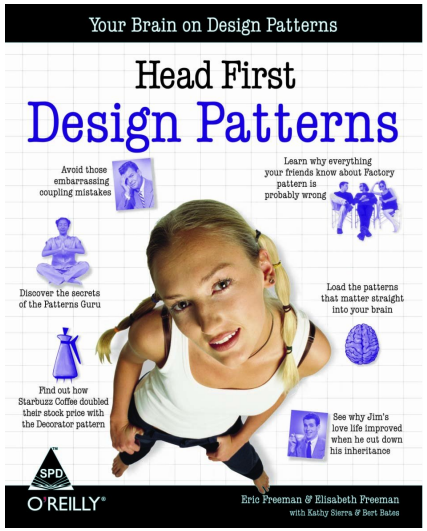
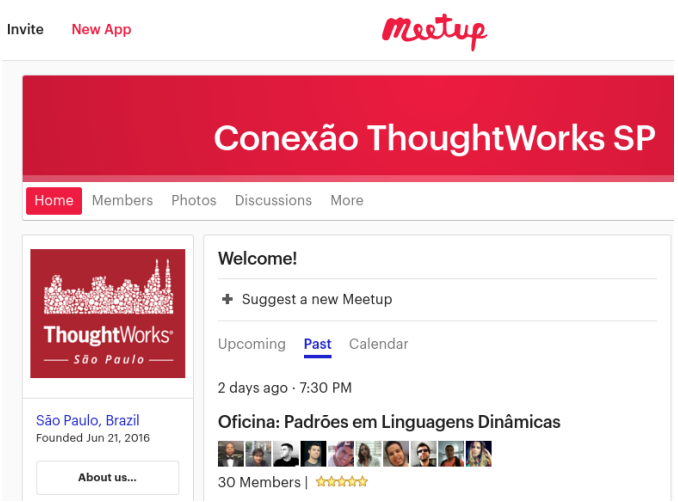
The Proxy Pattern

Meetup – Oficina Padrões em Linguagens Dinâmicas







https://www.meetup.com/conexaotwsp/

Daniel Carvalho @danielscarvalho

The Proxy Pattern

Core and Simple Patterns

#	purpose	name	C	S	HF	R	PN	feature	related patterns
6	Structural	Adapter	C	S	+	3			Bridge, Decorator, Proxy
8	Structural	Composite	C	S	+	9			Chain of Responsibility, Decorator, Flyweight, Iterator, Visitor
9	Structural	Decorator	C	S	+	4			Adapter, Composite, Strategy
19	Behavioral	Observer	C	S	+	1	MA	Method Combination	Mediator, Singleton
21	Behavioral	Strategy	C	S	+	3	MA	First class functions	Flyweight
22	Behavioral	Template Method	C	S	+	1	M	First class functions	Factory Method, Strategy
10	Structural	Facade	C		+	1	MA	Modules	Abstract Factory, Mediator, Singleton
12	Structural	Proxy	C		+++	1	M	First class types	Adapter, Decorator
14	Behavioral	Command	C		+	1	M	First class functions	Composite, Memento, Prototype
16	Behavioral	Iterator	C		+	3	MA	Macros	Composite, Factory Method, Memento
17	Behavioral	Mediator	C			2	MA	Method Combination	Facade, Observer
20	Behavioral	State	C		+	1	M	First class types	Flyweight, Singleton
1	Creational	Abstract Factory		S	+	6	MA	First class types	Factory Method, Prototype, Singleton
3	Creational	Factory Method		S	+	3	M	First class types	Abstract Factory, Template Method, Prototypes
2	Creational	Builder				1	MA	Multimethods	Abstract Factory, Composite
4	Creational	Prototype				3			Abstract Factory, Composite, Decorator
5	Creational	Singleton			+	4	A		Abstract Factory, Builder, Prototype
7	Structural	Bridge				1			Abstract Factory, Adapter
11	Structural	Flyweight				4	M	First class types	Composite, State, Strategy

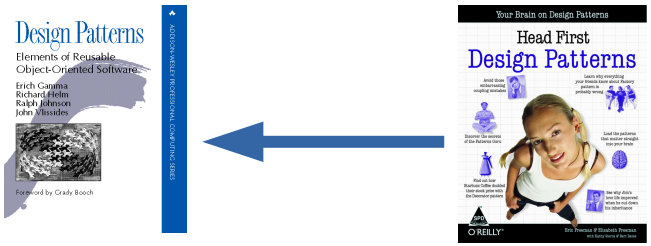
http://python.pro.br/wiki/index.php?title=Design_patterns

The Proxy Pattern

Definition

- The Proxy is known as a structural pattern, as it's used to form large object structures across many disparate objects. The definition of Proxy provided in the original "Gang of Four" book on Design Patterns states:

"Allows for object level access control by acting as a pass through entity or a placeholder object."



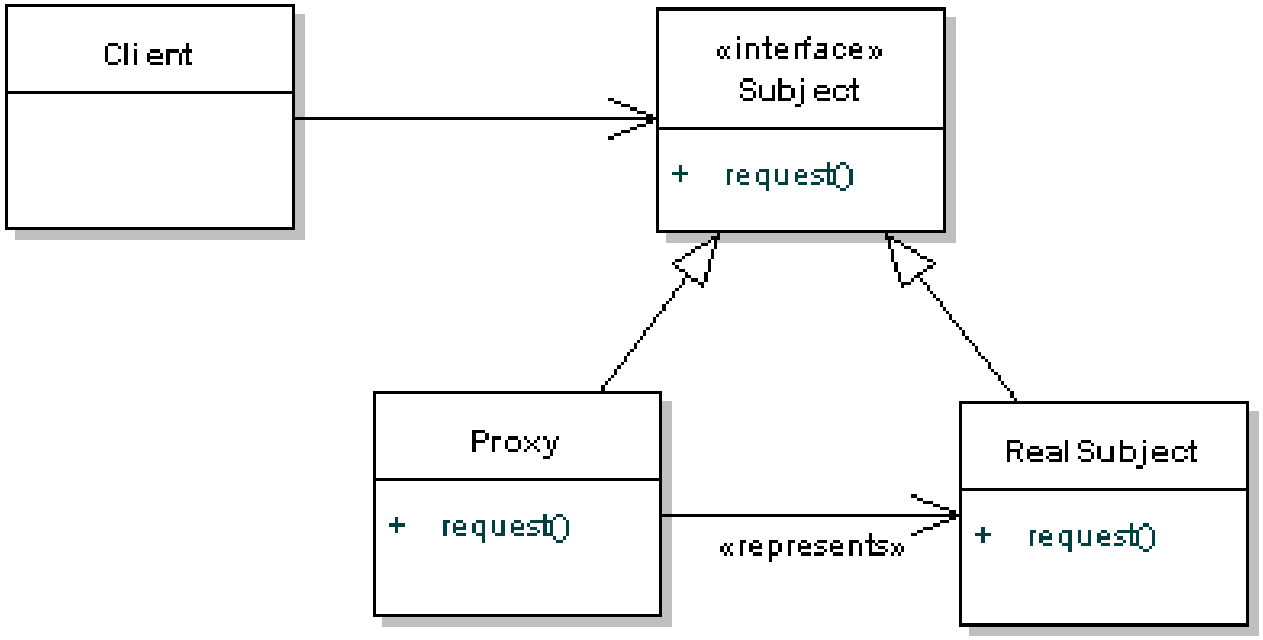
Real Subject
1994

Proxy
2004

https://dzone.com/articles/design-patterns-proxy

The Proxy Pattern

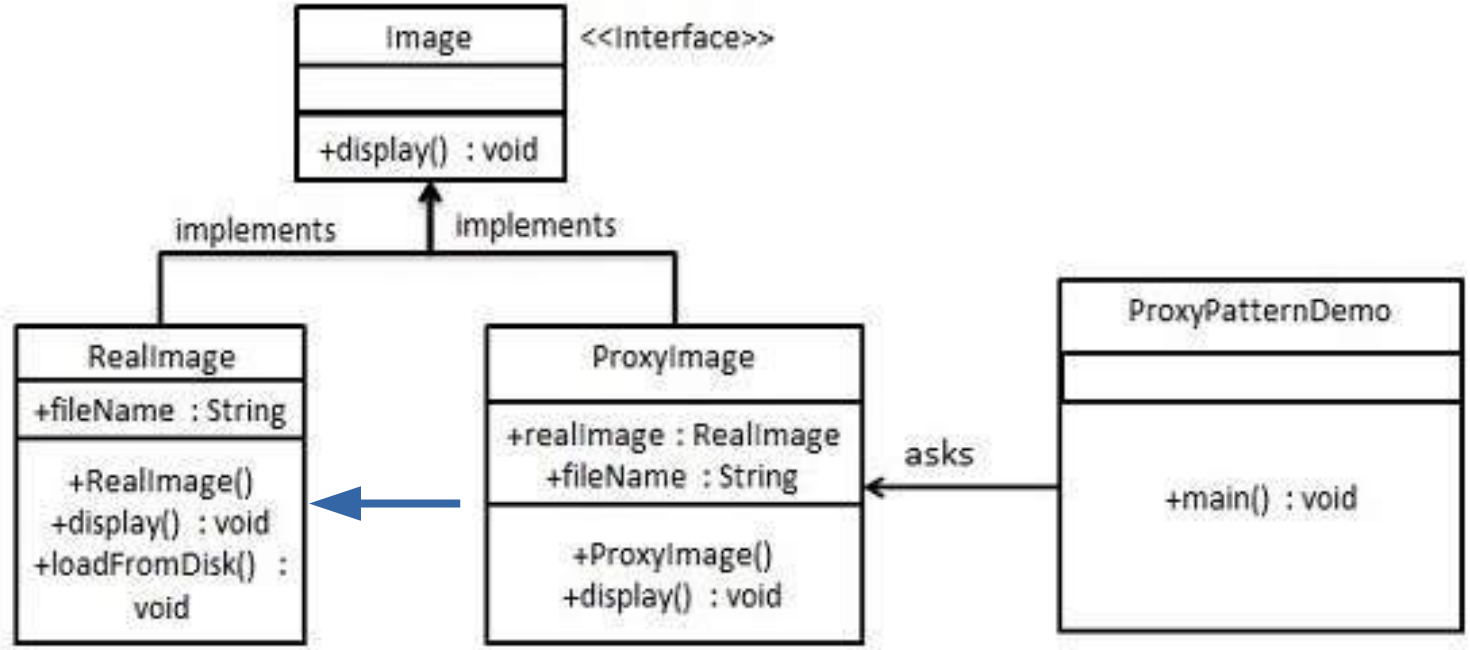
Class Diagram



https://dzone.com/articles/design-patterns-proxy

The Proxy Pattern

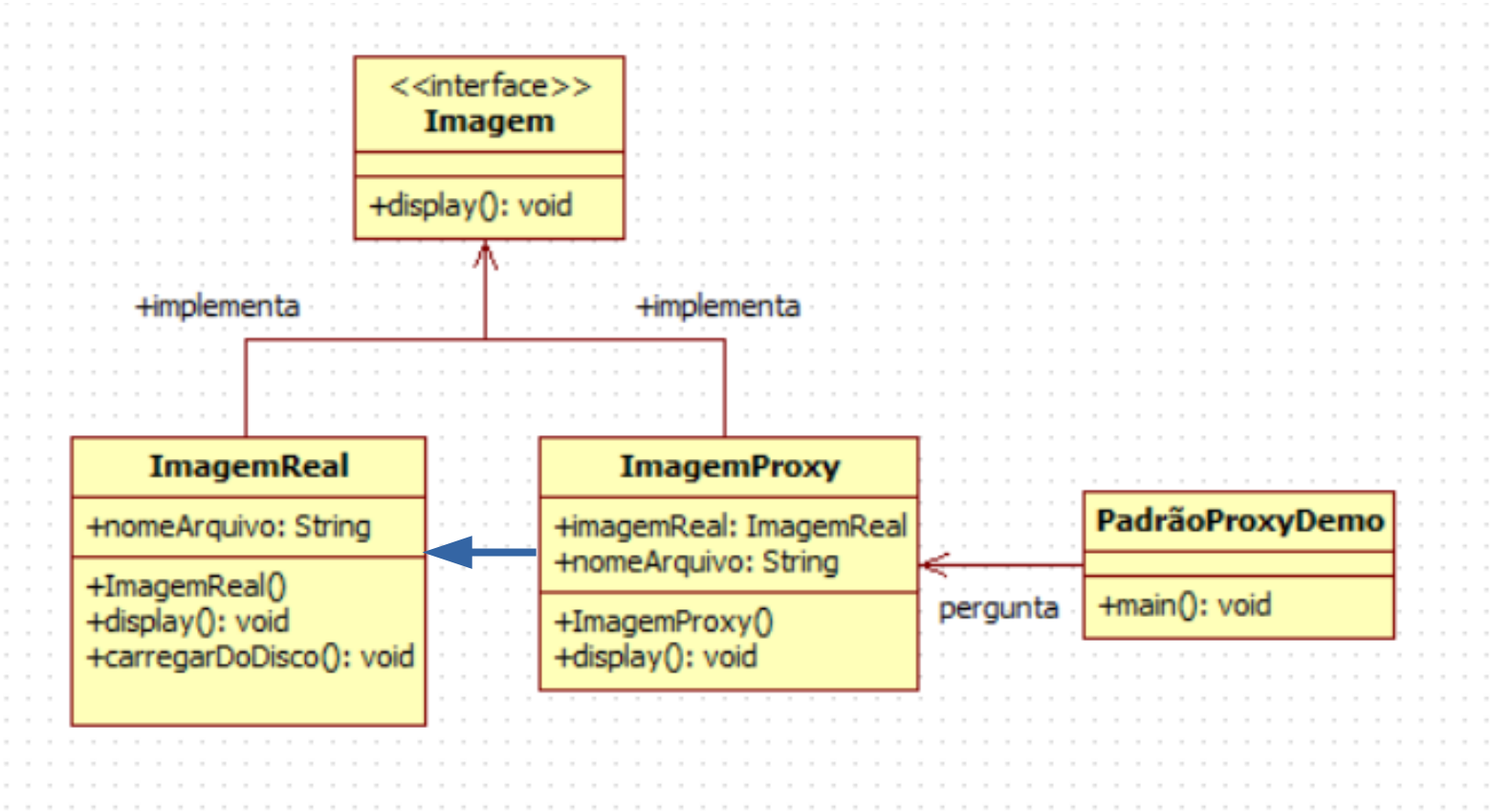
Class Diagram (another)



https://www.tutorialspoint.com/design_pattern/proxy_pattern.htm

The Proxy Pattern

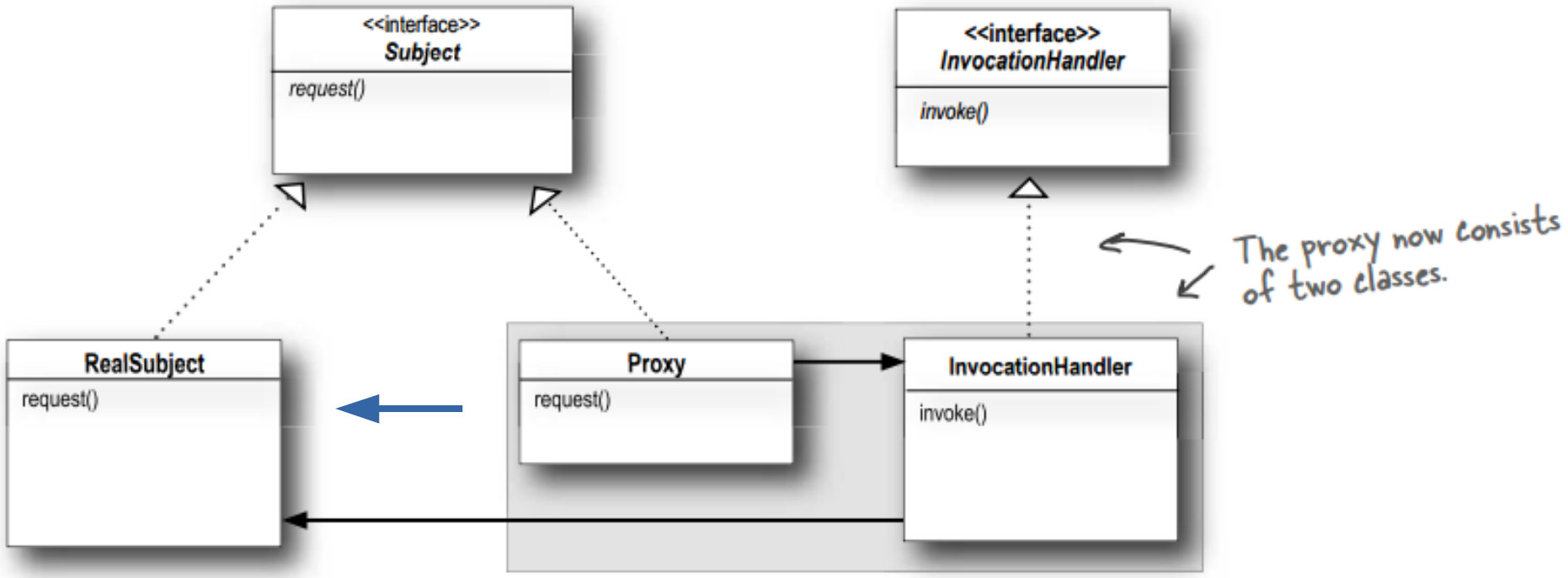
Class Diagram (another)



https://pt.wikipedia.org/wiki/Proxy_(padr%C3%B5es_de_projeto)

The Proxy Pattern

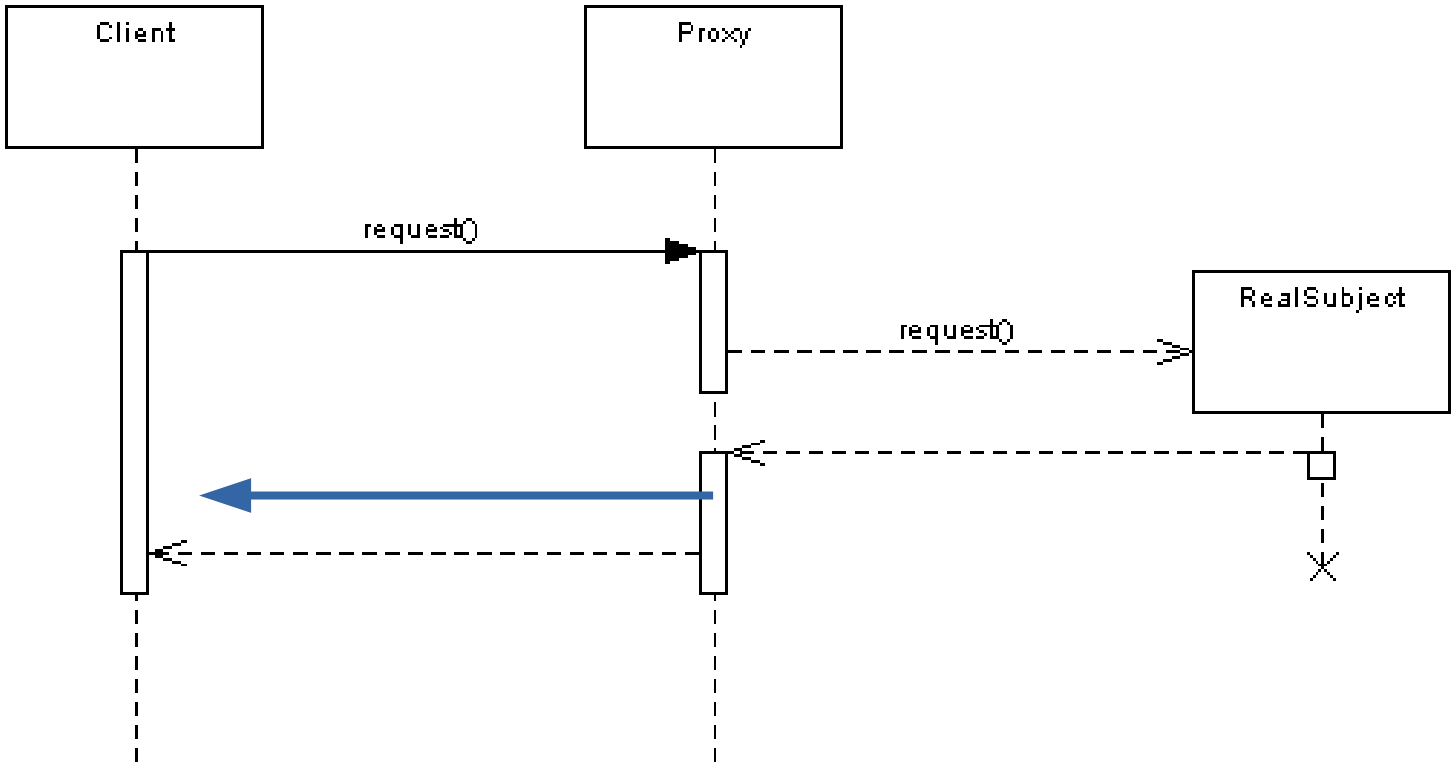
Class Diagram (another)



HF book, page XXI

The Proxy Pattern

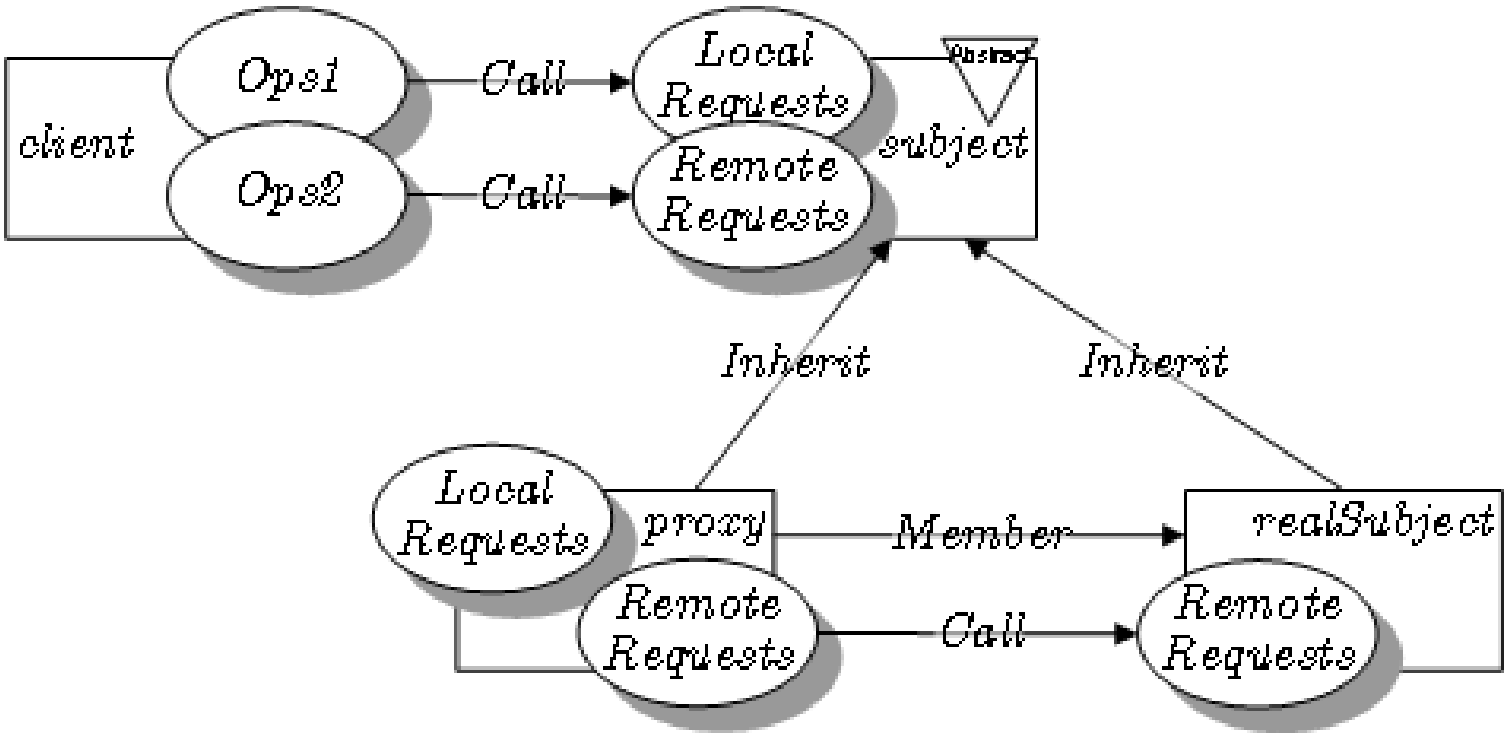
Sequence Diagram



https://dzone.com/articles/design-patterns-proxy

The Proxy Pattern

Proxy in LePUS3 notation



https://en.wikipedia.org/wiki/Proxy_pattern

There are examples in different programming languages

The Proxy Pattern

Code in Java

```
public interface Image {
     public void displayImage();
}
```

```
public class RealImage implements Image {

     public RealImage(URL url)    {      //load up the image
          loadImage(url);
     }

     public void displayImage()    {       //display the image

      }   //a method that only the real image has

     private void loadImage(URL url)  {
          //do resource intensive operation to load image
     }
}
```

```
public class ProxyImage implements Image {

     private URL url;

     public ProxyImage(URL url)     {
           this.url = url;
     }    //this method delegates to the real image


     public void displayImage()    {
          RealImage real = new RealImage(url);
          real.displayImage();
     }
}
```

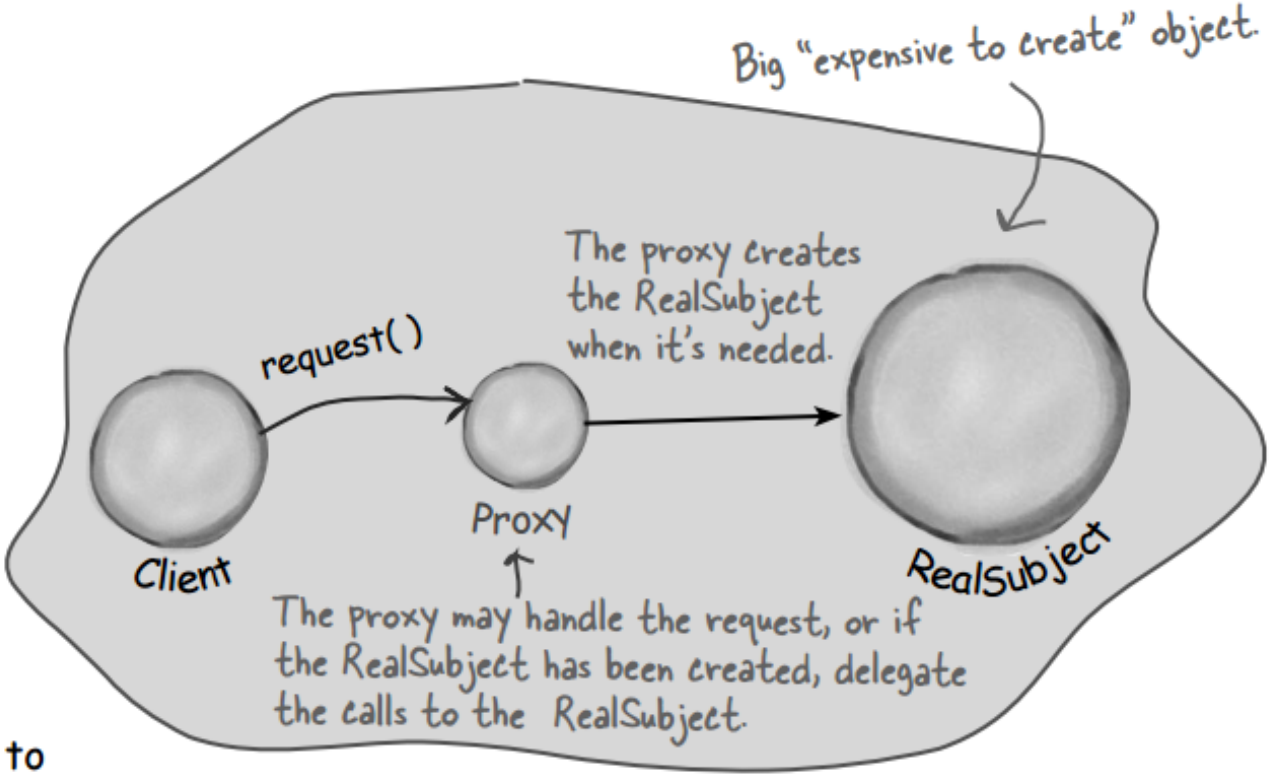

https://dzone.com/articles/design-patterns-proxy

The Proxy Pattern

Remote Access: Java RMI

Virtual Proxy

Virtual Proxy acts as a representative for an object that may be expensive to create. The Virtual Proxy often defers the creation of the object until it is needed; the Virtual Proxy also acts as a surrogate for the object before and while it is being created. After that, the proxy delegates requests directly to the RealSubject.

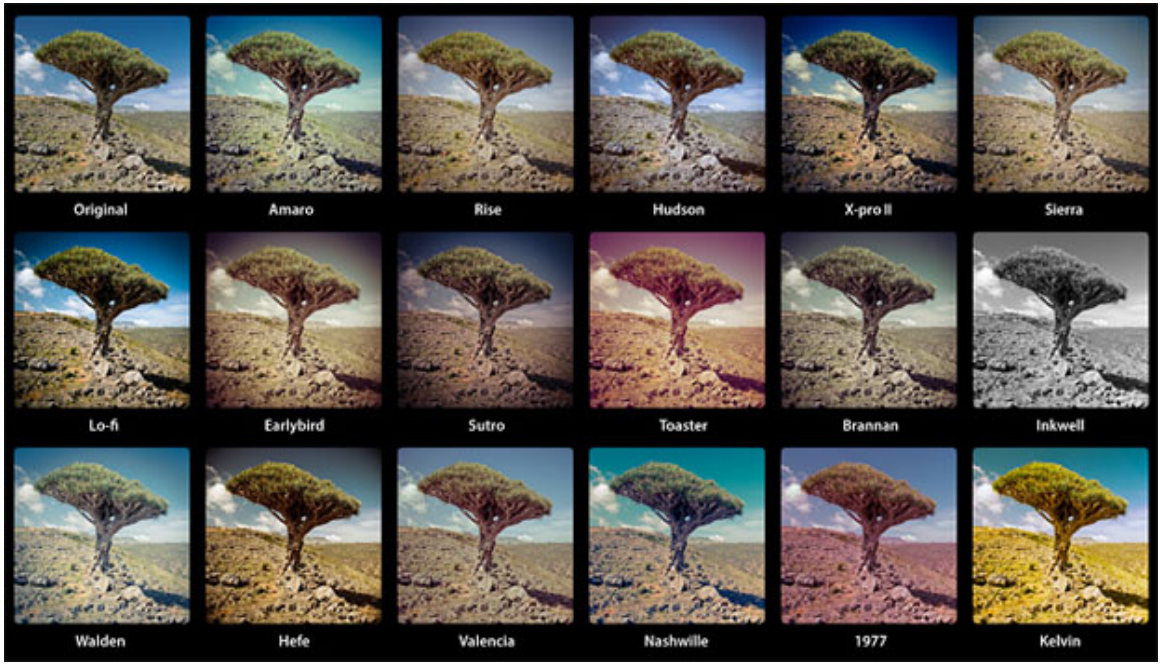


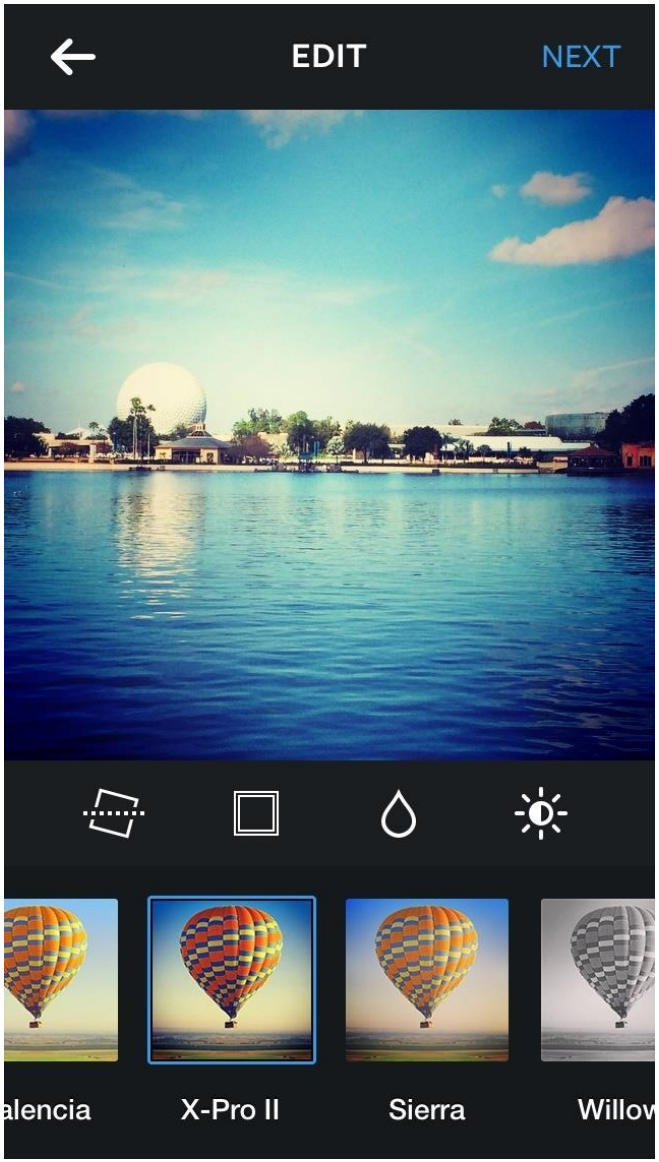
HF Book page 462

The Proxy Pattern

Example: Instagram

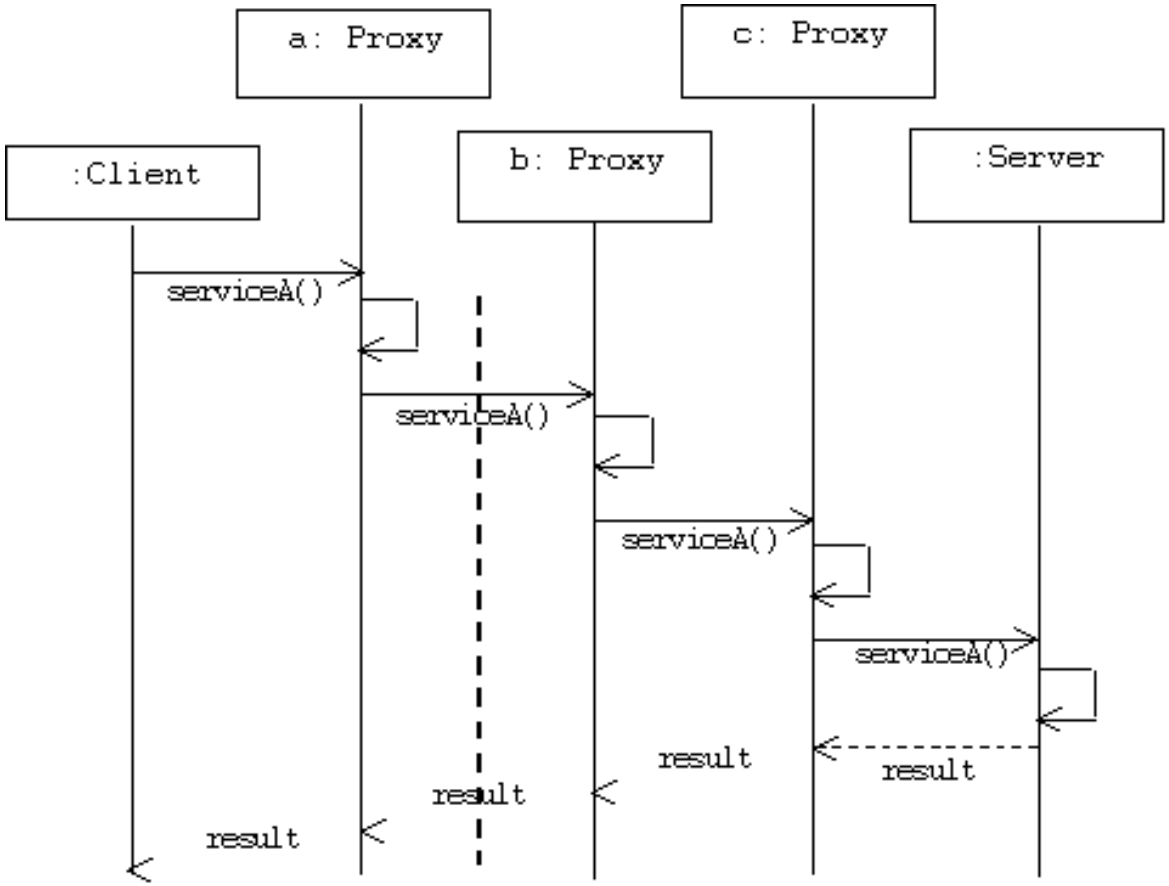
- Original image preserved
- Filters appliaed to small images

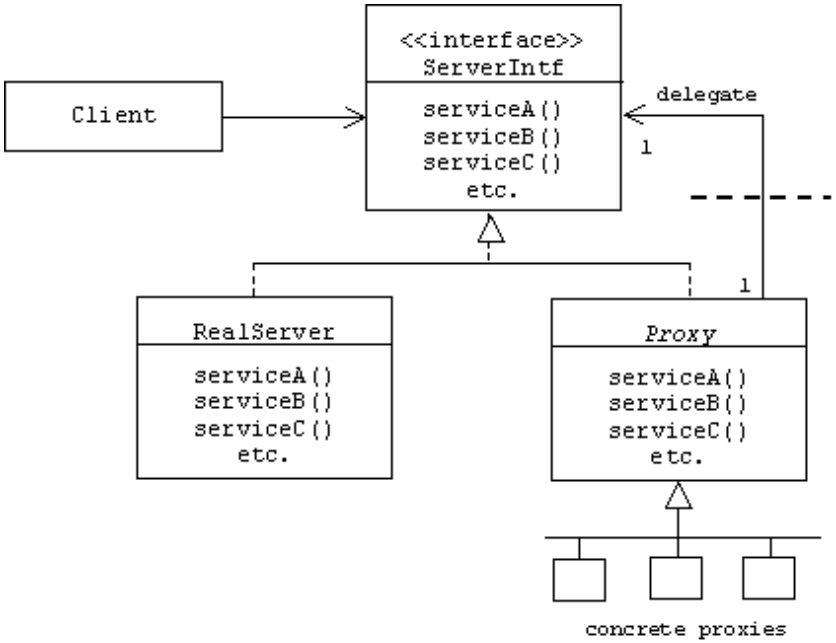




The Proxy Pattern

Example: Proxy Server

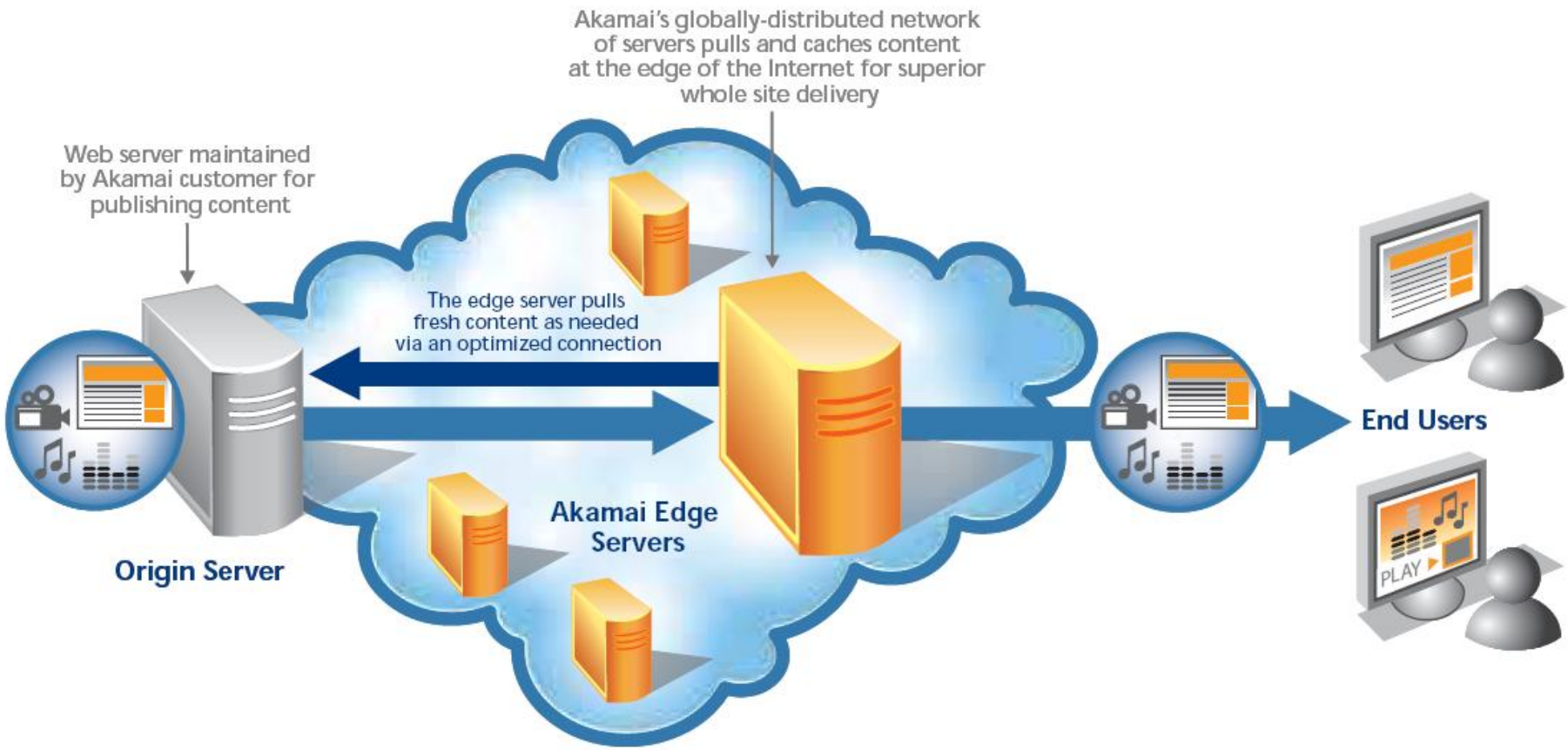




http://www.cs.sjsu.edu/~pearce/oom/patterns/behavioral/proxy.htm

The Proxy Pattern

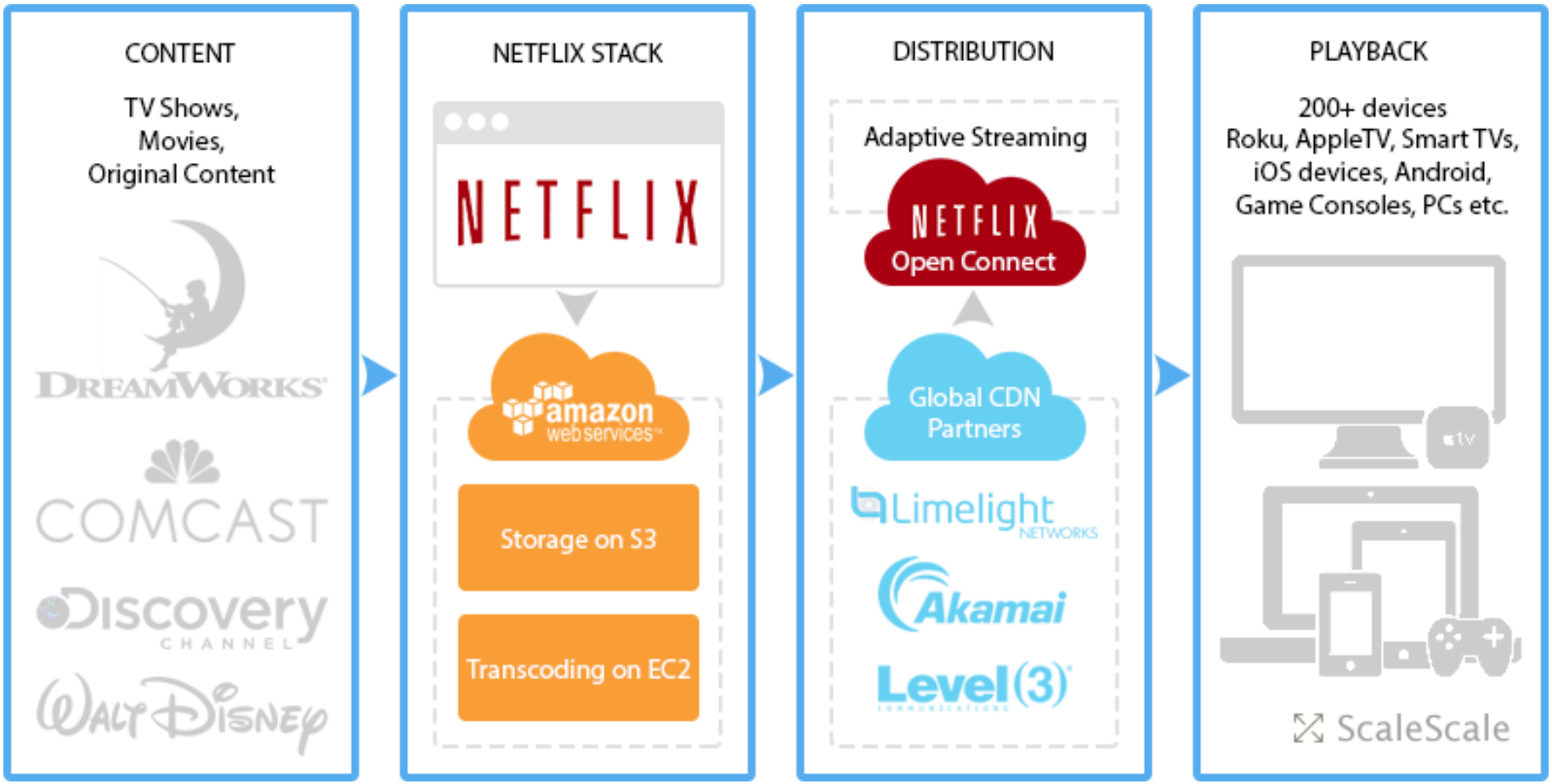
Example: Proxy Server - Akamai



http://key-performance.eu/web_new/index.php/features/cdn

The Proxy Pattern

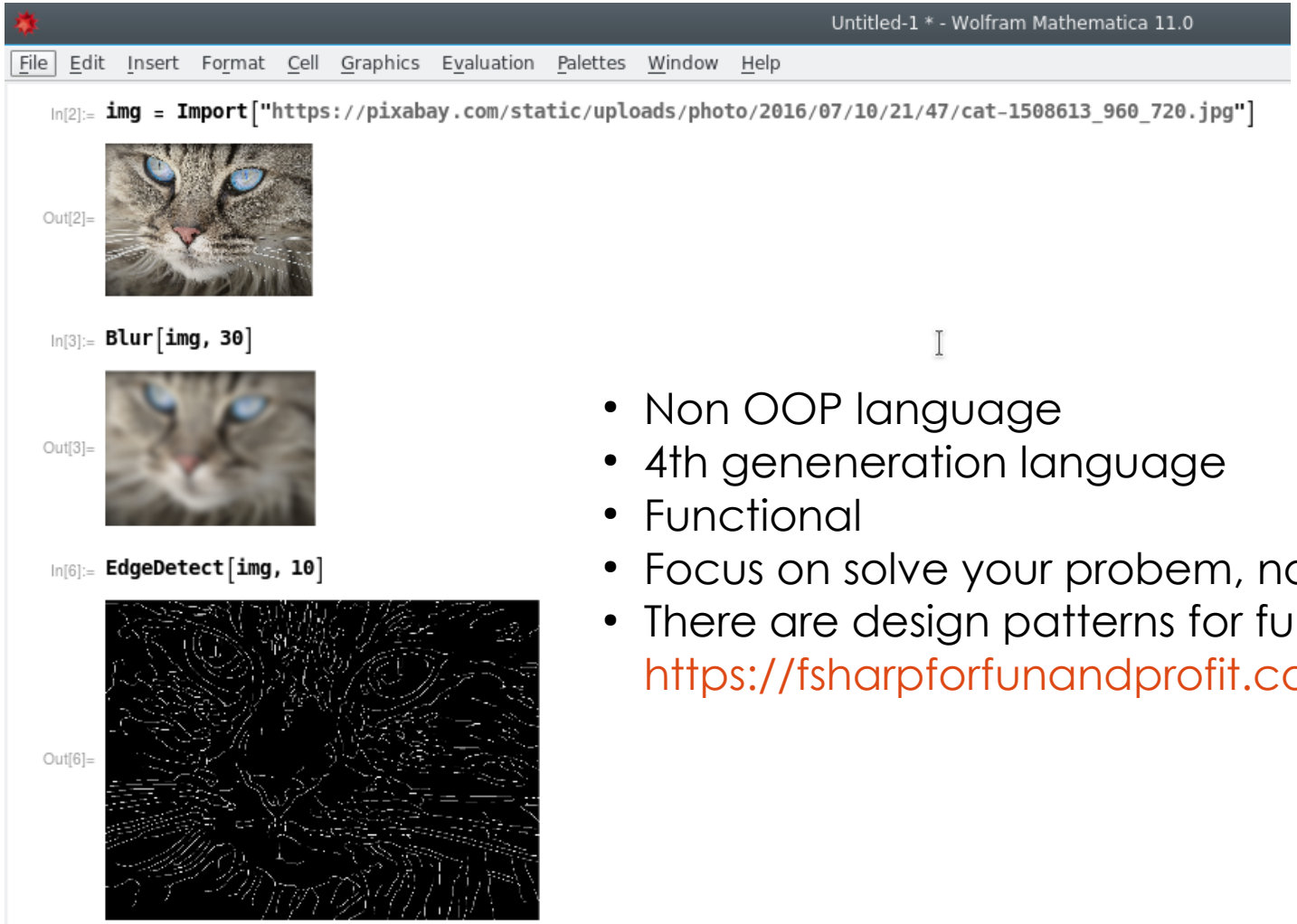
Example: Proxy Server - NETFLIX



http://highscalability.com/blog/2015/11/9/a-360-degree-view-of-the-entire-netflix-stack.html

The Proxy Pattern

Example: Wolfram Language (Mathematica) – Not applicable



- Non OOP language
- 4th geneneration language
- Functional
- Focus on solve your probem, not how to compute
- There are design patterns for funcional programming: https://fsharpforfunandprofit.com/fppatterns/