Presentation patterns for web applications with Play! Framework

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Table of Contents

Introduction

Outline

Trends

- Enterprises's needs lead the market.
- Offering services: SOA wins.
- The web changes the status quo.
- SOA is not web compliant.
- Exposing services through the web requires extra effort.
- The game changes: new possibilities and challenges.

Challenges

- Real time data has to be pushed.
- Huge amounts of data.
- Need for scalability and integration.
- Easy integration and accessibility.
- Interoperability.

Addressing the challenges

- Embrace the internet.
  - HTTP Protocol
  - HTML5
  - XML/JSON
  - Javascript
  - CSS
- Paradigm shift: client-side.
- Simplicity.
- A framework to rule them all.
- **Patterns for enterprise applications**.

Play! Framework

Outline

What is Play! Framework?

- A web framework focused on:
  - Simplicity.
  - Productivity.
  - Scalability.
  - Designed for the modern web.
    - Concentrate on server-side.
    - Delegate AMAP to the client.
  - Embrace internet standards.
  - Java and Scala.
  - RESTful architecture web applications.
  - Model-View-Controller.

RESTful architecture

- Implemented using HTTP and REST principles.
- Representational state transfer (REST) principles:
  - Uniform interface.
  - Stateless.
  - Caching.
  - Layers.
  - Code on demand.
- Goals:
  - Performance.
  - Scalability.
  - Portability.
  - Reliability.
  - SIMPLICITY.

Project layout

```
app                          → Application sources
 └ assets                    → Compiled asset sources
    └ stylesheets            → Typically LESS CSS sources
    └ javascripts            → Typically CoffeeScript sources
 └ controllers               → Application controllers
 └ models                    → Application business layer
 └ views                     → Templates
build.sbt                    → Application build script
conf                         → Configurations files and other non-compiled resour
 └ application.conf          → Main configuration file
 └ routes                    → Routes definition
public                       → Public assets
 └ stylesheets               → CSS files
 └ javascripts               → Javascript files
 └ images                    → Image files
project                      → sbt configuration files
 └ build.properties          → Marker for sbt project
 └ plugins.sbt               → sbt plugins including the declaration for Play its
lib                          → Unmanaged libraries dependencies
logs                         → Standard logs folder
 └ application.log           → Default log file
target                       → Generated stuff
 └ scala-2.10.0
    └ cache
    └ classes                → Compiled class files
    └ classes_managed        → Managed class files (templates, ...)
    └ resource_managed       → Managed resources (less, ...)
    └ src_managed            → Generated sources (templates, ...)
test                         → source folder for unit or functional tests
```

Patterns in Play!

Outline

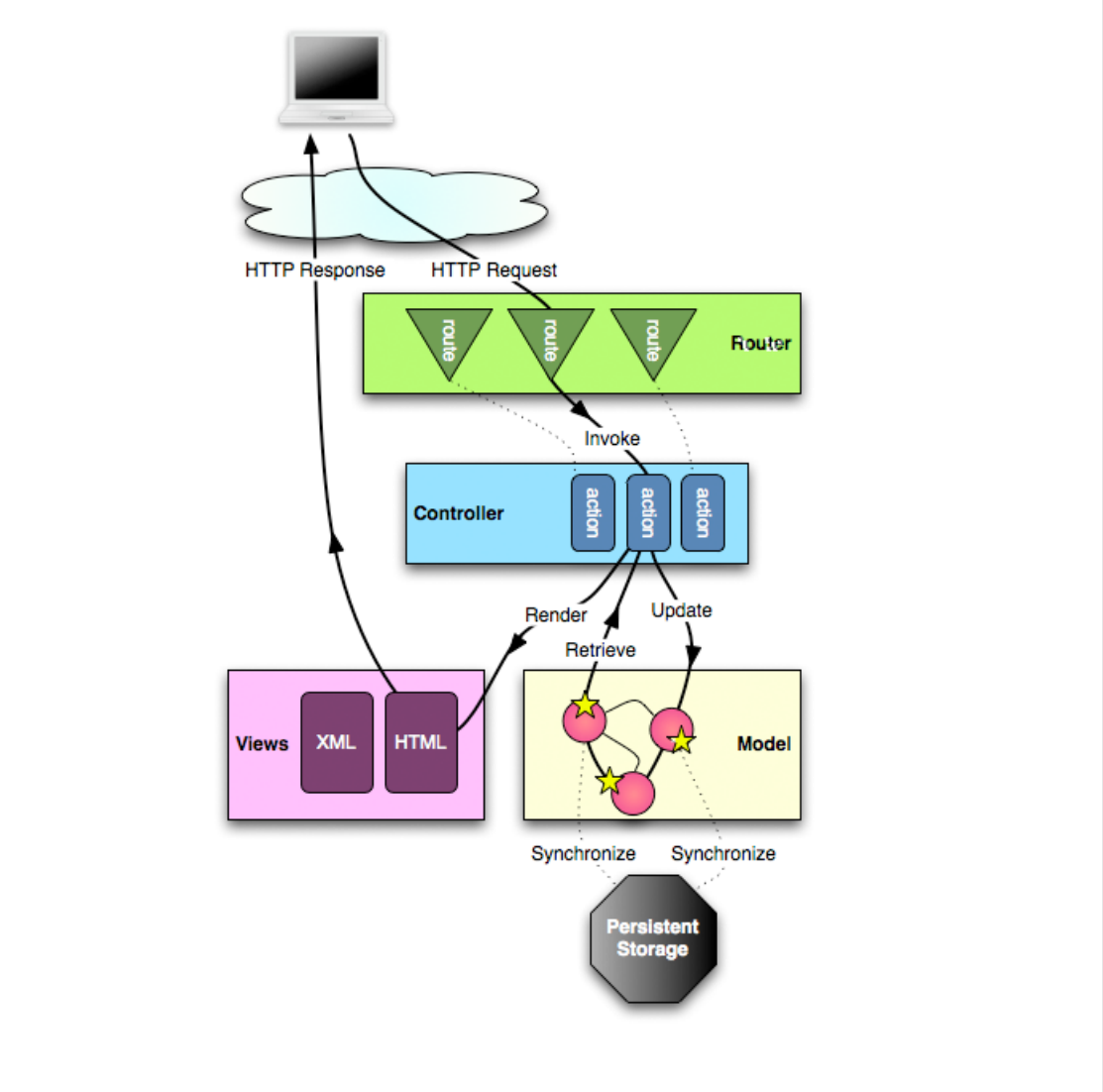
Patterns in Play!

- **Model-View-Controller**.
- Model.
  - Object-Relational Mapping.
- Controller.
  - Front Controller.
- View.
  - Template View.
  - Composite View.

The MVC application model

- Models in app/models
  - Java/Scala classes.
  - Data + Operations, mainly object-oriented.
  - Business logic and storage.
- Views in app/views
  - HTML/XML/JSON/Scala templates.
  - Directives as placeholders for data.
  - Render models to user interfaces.
- Controllers in app/controllers
  - Java/Scala classes.
  - Methods as actions, mainly procedural.
  - Receive requests, act (update models + render views) and response.

Request/Response flow



Object Relational Mapping

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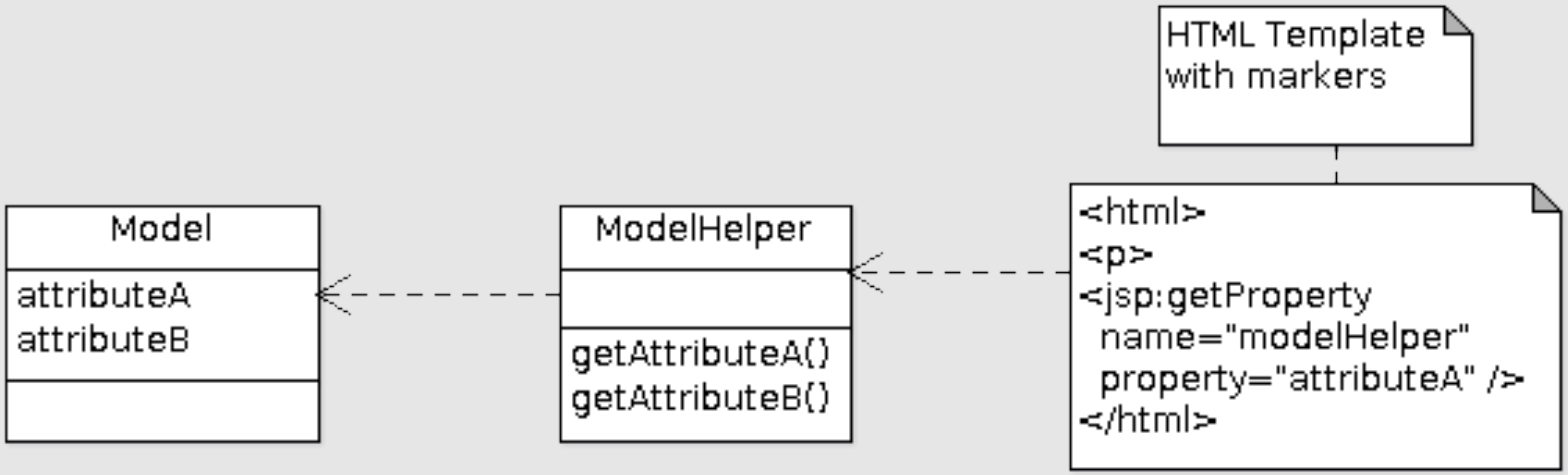
Template View

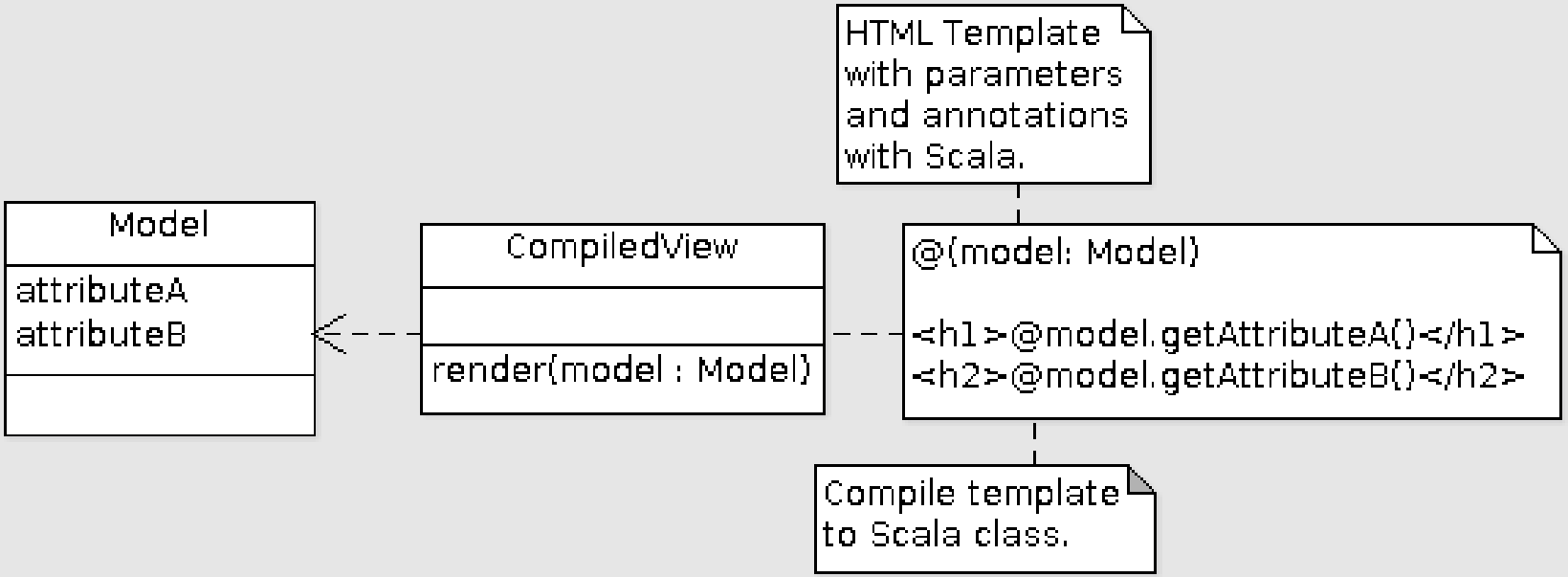
- *"Renders information into HTML by embedding markers in an HTML page"[Fow02]*



- Pros: Centralized control, Thread safety, Configurability.
- Cons: Possible performance issues, Maintenance costs.

Template View

- *The template with annotations is compiled to a Scala.class with a render() method with the template parameters.*



- The controller calls the render method of the view.
- The view communicates with the model (parameter).

Composite View

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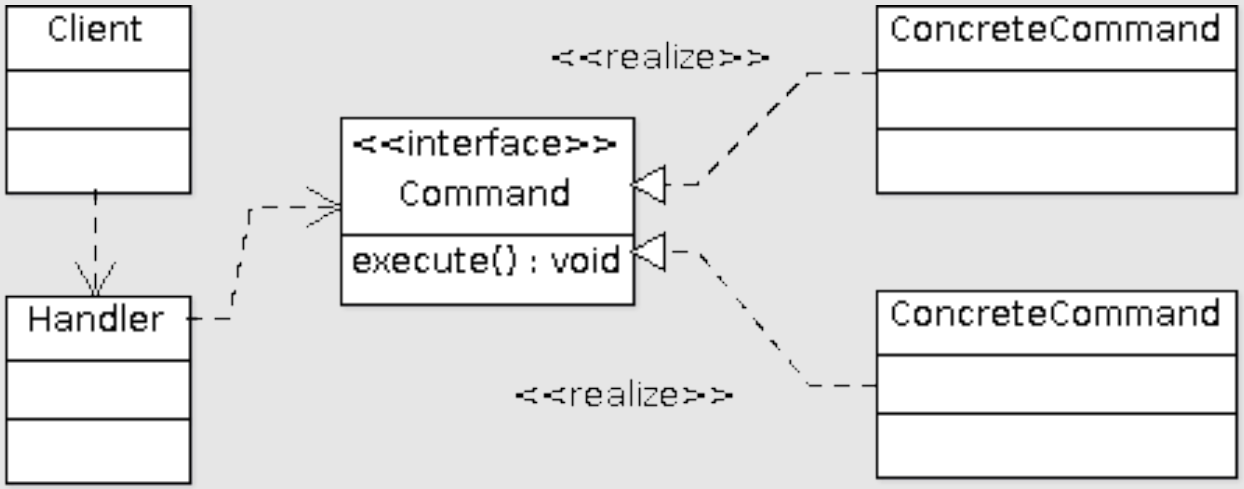
Front Controller Pattern

- *"Consolidates all request handling by channeling requests through a single handler object" [Fow02]*



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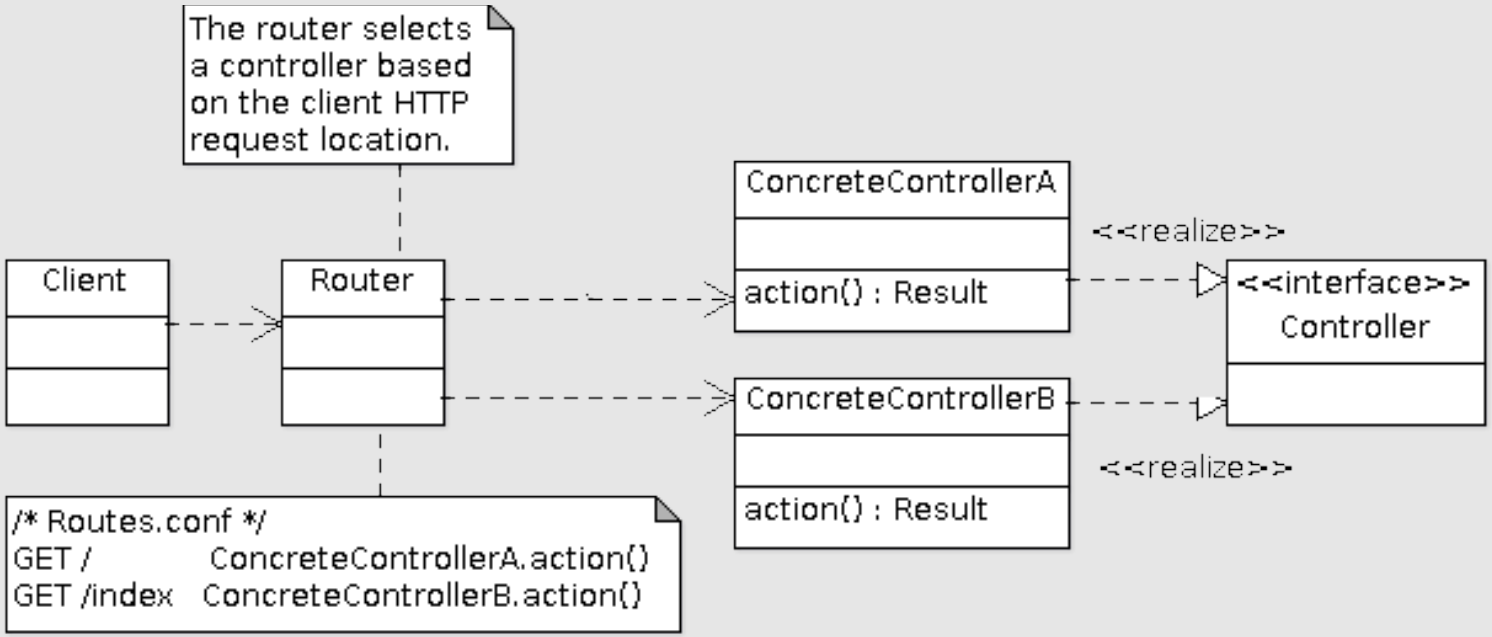
Front Controller in Play!

- The router (handler) selects a controller (command) and a particular action (execute) depeding on the HTTP request.



- Routes.conf file determines the location-action relationship.
- Actions return a result that holds the HTTP Response.

Conclusions

Outline

Conclusions

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References

- Martin Fowler, *Patterns of enterprise application architecture*, Addison-Wesley Professional, 2002.
- Nicolas Leroux and Sietse de Kaper, *Play for java*, Manning Publications, 2014.
- Erik Bakker Peter Hilton and Francisco Canedo, *Play for scala*, Manning Publications, 2014.
- Alexander Reelsen, *Play framework cookbook*, Packtpub Publications, 2014.