

# Génie logiciel avancé

Spécification, Conception, Développement et Gestion du cycle de vie d'une solution informatique

2017-2018



# Plan des cours

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- 1 Modalités du cours,  
Présentation du **génie logiciel**
- 2 Cycles de développement, Spécifications
- 3 Conception
- 4 Techniques de conception, UML
- 5 Design patterns
- 6 Environnement de développement :  
IDE, SCM, Environnement de test, Intégration continue, etc.
- 7 Suivi de projet,  
Tests et revues de code
- 8 Documentation
- 9 Recettes, présentation client
- 10 Déploiement,  
Gestion des évolutions fonctionnelles
- 11 Présentation des projets par les étudiants
- 12 Séance de questions / réponses

# Conception

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## Génie Logiciel Avancé Cours 2 — Conception

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2014-2015

URL <http://upsilon.cc/zack/teaching/1415/gla/>  
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Présentation complète : <https://upsilon.cc/~zack/teaching/1415/gla/cours-02-design.pdf>

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# Planification d'un projet

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## 1. Spécifications

- Clarifier le plus possible les fonctionnalités demandées
- Lever toutes les ambiguïtés
- Définir les limites du système à réaliser

## 2. Conception

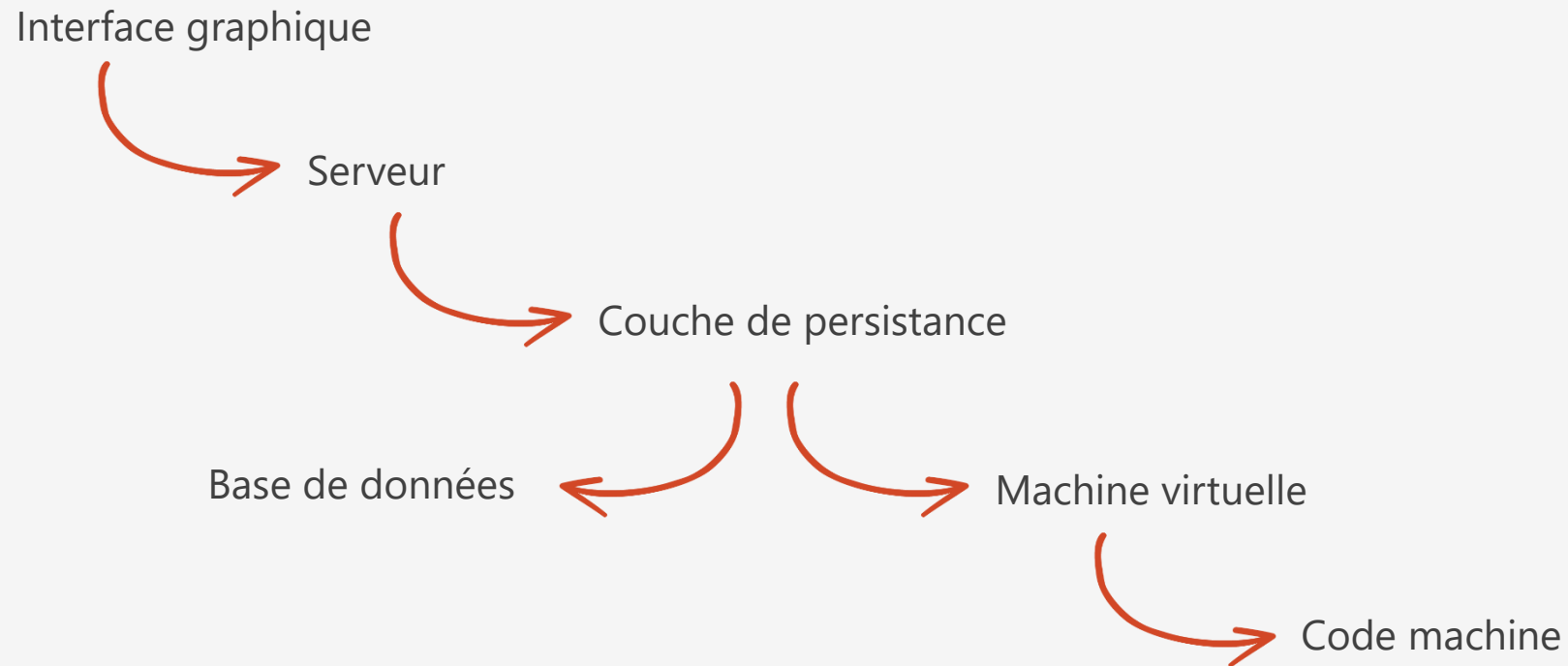
1. Définir les composants du système et son architecture globale
2. Définir toutes les interfaces
3. Concevoir chaque composant

## 3. Réalisation

.... le plus tard possible... C'est une **fausse « bonne idée »** que de vouloir développer très tôt !

# Niveaux d'abstraction

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Chaque niveau d'abstraction a un rôle

# Interfaces

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Les liens entre les différentes couches définissent l'interface

Une interface permet :

1. de rendre explicite les échanges entre deux niveaux
2. de cacher ce qui n'est pas utile
3. de faire évoluer l'implémentation d'un niveau sans modifier le niveau supérieur

# Interfaces – IHM / Serveur

|     | A               | B                           | C                                     | D      | E                         | F                        |
|-----|-----------------|-----------------------------|---------------------------------------|--------|---------------------------|--------------------------|
| 1   | Module          | View                        | Fonction                              | Method | Path Param 1              | Path Param 2             |
| 143 | action-followup | attachment                  | Return attachments                    | GET    | X = id of the action      |                          |
| 144 | action-followup | attachment                  | Add an attachment                     | POST   | X = id of the action      |                          |
| 145 | action-followup | attachment                  | Return an attachment (with the conte  | GET    | X = id of the action      | Y = id of the attachment |
| 146 | action-followup | attachment                  | Delete an attachment                  | DELETE | X = id of the action      | Y = id of the attachment |
| 147 | action-followup | note                        | Return a note                         | GET    | X = id of the action      |                          |
| 148 | action-followup | note                        | Modify a note                         | POST   | X = id of the action      |                          |
| 149 | action-followup | discussion                  | Return a discussion                   | GET    | X = id of the action      |                          |
| 150 | action-followup | discussion                  | Return discussion users               | GET    | X = id of the action      |                          |
| 151 | action-followup | discussion                  | Modify discussion users               | POST   | X = id of the action      |                          |
| 152 | action-followup | discussion                  | Return the attachment of a message    | GET    | X = id of the action      | Y = id of the attachment |
| 153 | action-followup | discussion                  | Add a message                         | POST   | X = id of the action      |                          |
| 154 | publication     | list-publication            | Return the list of publications       | GET    |                           |                          |
| 155 | publication     | list-publication            | Export the list of publications       | GET    |                           |                          |
| 156 | publication     | list-publication            | Delete a publication                  | DELETE |                           |                          |
| 157 | publication     | create-publication          | Create a publication                  | POST   |                           |                          |
| 158 | publication     | view-publication            | Return a publication                  | GET    | X = id of the publication |                          |
| 159 | publication     | view-publication-attachment | Return an attachment (with the conte  | GET    | X = id of the publication | Y = id of the attachment |
| 160 | publication     | edit-publication            | Return a publication                  | GET    | X = id of the publication |                          |
| 161 | publication     | edit-publication            | Return publication users              | GET    | X = id of the publication |                          |
| 162 | publication     | edit-publication            | Modify a publication                  | POST   | X = id of the publication |                          |
| 163 | user-prefrences | view-preferences            | Returns user preferences              | GET    |                           |                          |
| 164 | user-prefrences | edit-preferences            | Returns user preferences              | GET    |                           |                          |
| 165 | user-prefrences | edit-preferences            | Modify user preferences               | POST   |                           |                          |
| 166 | user-prefrences | edit-password               | Modify user password                  | POST   |                           |                          |
| 167 | reporting       | home                        | Return the list of existing filters   | GET    |                           |                          |
| 168 | reporting       | home                        | Modify the existing filters           | POST   |                           |                          |
| 169 | reporting       | occurrences-period          | Return the occurrences divided by per | GET    |                           |                          |

Expliciter tous les web-services nécessaires

# Interfaces – Serveur / Persistance

```
public class Action {  
    public enum State {  
        OPEN, CLOSED, VALIDATED;  
    };  
  
    public enum Type {  
        SAFETY, FINDING, OTHER;  
    };  
  
    public enum Mode {  
        CORRECTIVE, PREVENTIVE;  
    };  
  
    public static class ActionDelay {  
        public Integer value;  
        public String color;  
  
        public ActionDelay(Integer value, String color) {  
            super();  
            this.value = value;  
            this.color = color;  
        }  
    }  
  
    @PrimaryKey  
    @Persistent(valueStrategy = IdGeneratorStrategy.NATIVE)  
    protected Long id;
```

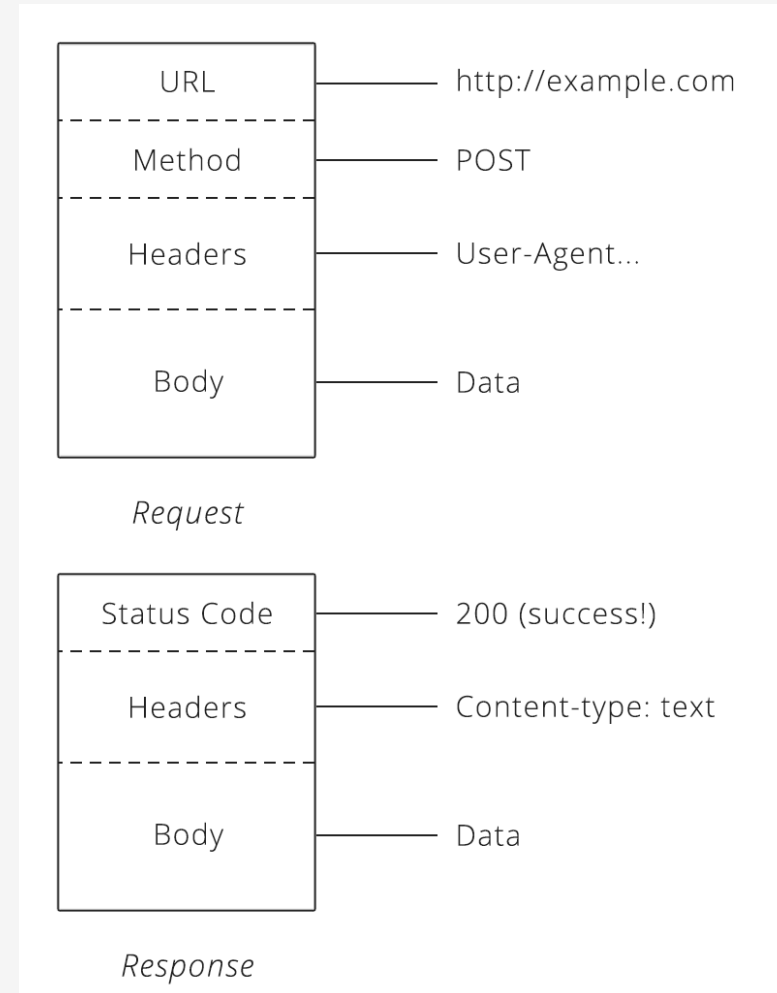
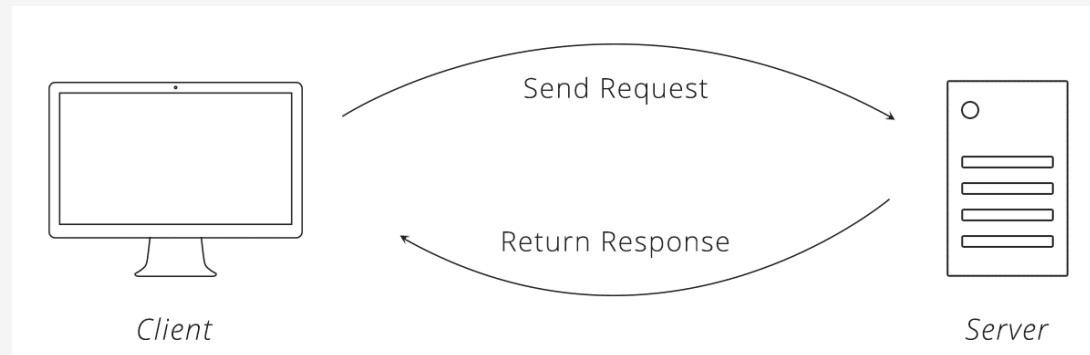
```
public interface ActionDao {  
  
    /**  
     * Find the actions related to this defense.  
     *  
     * @param defense  
     *           a Bow-Tie defense  
     * @return list of safety actions  
     */  
    List<Action> getSafetyActions(Defense defense);  
  
    /**  
     * Find the actions related to this impact assessment.  
     *  
     * @param assessment  
     *           an impact assessment  
     * @return list of safety actions  
     */  
    List<Action> getSafetyActions(ImpactAssessment assessment);
```

Définir les objets métiers et les méthodes d'accès  
Bien garder en tête qu'il s'agit d'interfaces !



# Annexe – Web-services REST

## Les web-services REST – Un exemple parmi d'autres...



## Annexe – Web-services REST

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La spécification Java : JAX-RS

Un exemple d'implémentation : **Jersey**

```
7
8  /**
9   * Root resource (exposed at "myresource" path)
10  */
11  @Path("myresource")
12  public class MyResource {
13
14      /**
15       * Method handling HTTP GET requests. The returned object will be sent
16       * to the client as "text/plain" media type.
17       *
18       * @return String that will be returned as a text/plain response.
19       */
20      @GET
21      @Produces(MediaType.TEXT_PLAIN)
22      public String getIt() {
23          return "Got it!";
24      }
25  }
```

## Annexe – Web-services REST

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```
package com.mkyong.json;


import java.util.List;

public class User {

    private String name;
    private int age;
    private List<String> messages;

    //getters and setters
}
```

Conversion Java -> JSON



```
{
  "name" : "mkyong",
  "age" : 33,
  "messages" : [ "hello jackson 1", "hello jackson 2", "hello jackson 3" ]
}
```

# Annexe – Web-services REST

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Un outil de test  
Plugin Chrome et Firefox  
REST Client

[-] Request

Method

POST

▼

URL

http://95.142.173.170:8448/ws/safety-occurrence/list-occurrence?save=true

☆ ▼

SEND

Headers

Remove All

Content-Type: application/json ×

Body

zaeaze

[-] Response

Response Headers

Response Body (Raw)

Response Body (Highlight)

Response Body (Preview)

1. Status Code : 403 Page requires login.

2. Cache-Control : must-revalidate,no-cache,no-store

3. Content-Length : 325

4. Content-Type : text/html; charset=ISO-8859-1

5. Date : Tue, 02 Feb 2016 21:18:00 GMT

6. Server : Jetty(9.2.14.v20151106)

7. WWW-Authenticate : Basic realm="realm"

## Quelques pointeurs pour la réalisation du projet

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|            |   |
|------------|---|
| RESTClient | <a href="https://addons.mozilla.org/fr/firefox/addon/restclient/">https://addons.mozilla.org/fr/firefox/addon/restclient/</a> |
| Jersey     | <a href="http://jersey.java.net">http://jersey.java.net</a>   |
| Apache CXF | <a href="https://cxf.apache.org/">https://cxf.apache.org/</a>   |
| Jackson    | <a href="https://github.com/FasterXML/jackson">https://github.com/FasterXML/jackson</a>                                       |
| Jettison   | <a href="https://github.com/codehaus/jettison">https://github.com/codehaus/jettison</a>                                       |