Play 2

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- Développeur @SERLI
- Scala, Java, web & OSS
  - ReactiveCouchbase, Weld-OSGi, Weld, etc ...
  - Poitou-Charentes JUG
- Membre de l'expert group CDI 1.1 (JSR-346)
- Membre de l'expert group OSGi Enterprise
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SERLI

- Société de conseil et d'ingénierie du SI
- 75 personnes
- 80% de business Java
- Contribution à des projets OSS
- 10% de la force de travail sur l'OSS
- Membre de l'EG JSR-346
- Membre de l'OSGi Alliance
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Historique

- Annoncé en novembre 2011 à Devoxx
  - Guillaume Bort rejoint le board Typesafe
- Réécriture complète du framework ‘from scratch’
- La version 2.0 sort en Avril 2012
- Play devient la stack web de typesafe

Welcome Scala

- Framework entièrement réécrit en Scala
- Entièrement basé sur des notions d’asynchronisme et de non bloquant
- Fournit une API Java complète
  - mais la vrai cible reste Scala

SBT

- Simple Build Tool
- Outil de build standard de facto pour Scala
  - Gère le versioning des librairies
  - Gère les dépendencies
  - Gère la compilation et le packaging

Akka

- Librairie Scala très populaire
- Paradigme de programmation orienté ‘acteurs’
- Bien plus poussé que les acteurs Scala fournis par défaut
  - devient le standard dans Scala 2.10
- Enormes capacités pour traitements distribués et concurrents

Ebean vs. Anorm

- Deux philosophies d'accès aux données
  - EBean => Java
    - implémentation stateless de JPA
  - Anorm => Scala
    - Wrapper JDBC avec beaucoup d'aide pour mapper les resultsets

Anorm

- Anorm is Not an Object Relationnal Mapper
- Wrapper au dessus de JDBC
  - pas d’ORM
- API scala
  - plus de problèmes liés à la structure de l’API Java
  - pas d’exceptions à gérer

Anorm

```scala
import anorm._
import play.api.db.DB

DB.withConnection { implicit c =>
  val result1: Boolean = SQL("Select 1").execute()
  val result2: Int =
    SQL("delete from City where id = 99").executeUpdate()
  val id: Option[Long] =
    SQL("insert into City(name, country) values ({name}, {country})")
     .on('name -> "Cambridge", 'country -> "New Zealand »)
     .executeInsert()
}
```

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Anorm

```
val code: String = SQL(
  """
    select * from Country c
    join CountryLanguage l on l.CountryCode = c.Code
    where c.code = {countryCode}
  """)
  .on("countryCode" -> "FRA").as(SqlParser.str("code").single)
```

```
val lang = "French"
val population = 10000000
val margin = 500000

val code: String = SQL"""
  select * from Country c
    join CountryLanguage l on l.CountryCode = c.Code
    where l.Language = $lang and c.Population >= ${population - margin}
    order by c.Population desc limit 1"""
  .as(SqlParser.str("Country.code").single)
```

Anorm

```
import anorm.SqlParser._

case class Language(name: String, language: String, official: Boolean)

val languageParser = str("name") ~ str("language") ~ str("isOfficial") map {
  case name ~ language ~ "T" => Language(name, language, true)
  case name ~ language ~ "F" => Language(name, language, false)
}

def spokenLanguages(countryCode: String): List[Language] = {
  SQL(
    """
      select * from Country c
      join CountryLanguage l on l.CountryCode = c.Code
      where c.code = {code};
    """
  ).on("code" -> countryCode).as(languageParser *)
}
```

Anorm

```scala
import anorm.SqlParser._

case class Language(name: String, language: String, official: Boolean)

val languageParser = get[String]("name") ~ get[String]("language") ~
                                         get[String]("isOfficial") map {
  case name ~ language ~ "T" => Language(name, language, true)
  case name ~ language ~ "F" => Language(name, language, false)
}

def spokenLanguages(countryCode: String): List[Language] = {
  SQL(
    """
      select * from Country c
      join CountryLanguage l on l.CountryCode = c.Code
      where c.code = {code};
    """
  ).on("code" -> countryCode).as(languageParser *)
}
```

Anorm: Types

↓JDBC / JVM→	BigDecimal1	BigInteger2	Boolean	Byte	Double	Float	Int	Long	Short
BigDecimal1	Yes	Yes	No	No	Yes	No	Yes	Yes	No
BigInteger2	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No
Boolean	No	No	Yes	Yes	No	No	Yes	Yes	Yes
Byte	Yes	No	No	Yes	Yes	Yes	No	No	Yes
Double	Yes	No	No	No	Yes	No	No	No	No
Float	Yes	No	No	No	Yes	Yes	No	No	No
Int	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No
Long	Yes	Yes	No	No	No	No	Yes	Yes	No
Short	Yes	No	No	Yes	Yes	Yes	No	No	Yes

Routes

```
GET    /clients/all              controllers.Clients.list()
GET    /clients/:id              controllers.Clients.show(id: Long)

GET    /files/*name              controllers.Application.download(name)

GET    /clients/$id<[0-9]+>      controllers.Clients.show(id: Long)


GET    /                         controllers.Application.show(page)


GET    /                         controllers.Application.show(page= home")
GET    /:page                    controllers.Application.show(page)

GET    /clients                  controllers.Clients.list(page:Int?=1)
```

Reverse Routing

```
package controllers

import play.api._
import play.api.mvc._

object Application extends Controller {
  def hello(name: String) = Action {
    Ok("Hello " + name + "!")
  }
}

# Hello action
GET   /hello/:name          controllers.Application.hello(name)

// Redirect to /hello/Bob
def helloBob = Action {
  Redirect(routes.Application.hello("Bob"))
}
```

Contrôleurs

```
package controllers

import play.api.mvc._

object Application extends Controller {

  def index = Action {
    Ok("It works!")
  }

  def hello(name: String) = Action {
    Ok("Hello" + name + "!")
  }
}
```

Contrôleurs

```
package controllers

import play.api.mvc._

object Application extends Controller {
 def index = Action {
     Redirect(« http://www.google.fr » )
   }
}
```

Contrôleurs

```
package controllers

import play.api.mvc._

object Application extends Controller {
  def index = Action {
    NotFound
  }
  def error = Action {
    InternalServerError("Oops")
  }
}
```

Body parsers

```scala
package controllers

import play.api._
import play.api.mvc._
import play.api.mvc.BodyParsers.parse

object Application extends Controller {
  def save = Action(parse.text) { request =>
    Ok("Got: " + request.body)
  }
  def saveJson = Action(parse.json) { request =>
    Ok(request.json)
  }
}
```

Asynchrone

- Le framework est complètement asynchrone by design
  - Utilisation de Akka pour traiter les requêtes
- Possibilité de renvoyer des résultats asynchrones depuis les contrôleurs
  - utile pour les traitements long
  - ne bloque pas les ressources

Asynchrone

- Le framework est complètement asynchrone by design
  - Utilisation de Akka pour traiter les requêtes

Asynchrone

```
package controllers
import play.api.mvc._

object Application extends Controller {
  def index = Action.async {
    val bob = Customer("Bob")
    val promiseOfOrders = Future { bob.orders() }
    promiseOfOrders.map { orders =>
      Ok(views.html.index(bob, orders))
    }
  }
}
```

Vues

- Vues également écrites en Scala
- Vues typesafe
  - il faut déclarer les paramètres de la vue
  - la vue est compilée

$$\begin{tikzcd}
\texttt{views/Application/index.scala.html} \arrow[d] \\
\texttt{views.html.Application.index()}
\end{tikzcd}$$

Vues

- Vues également écrites en Scala
- Vues typesafe
  - il faut déclarer les paramètres de la vue
  - la vue est compilée

Vues

```
@(customer: Customer, orders: Seq[Order])

<h1>Welcome @customer.name!</h1>

<ul>
  @orders.map { order =>
    <li>@order.title</li>
  }
@for(order <- orders) {
    <li>@order.title</li>
}
</ul>
```

paramètres du templates (typés)

utilisation d’un paramètre

expressions scala

Contrôleurs + vues

```
package controllers

import play.api.mvc._

object Application extends Controller {

  def index = Action {
  val bob = Customer("Bob")
    Ok(views.html.index(bob, bob.orders())
  }
}
```

Forms

```scala
import play.api.data._
import play.api.data.Forms._

case class UserData(name: String, age: Int)

val userForm = Form(
  mapping(
    "name" -> text,
    "age" -> number
  )(UserData.apply)(UserData.unapply)
)

val userData = userForm.bindFromRequest.get
```

Forms

```
userForm.bindFromRequest.fold(
  formWithErrors => {
    BadRequest(views.html.user(formWithErrors))
  },
  userData => {
    val newUser = models.User(userData.name, userData.age)
    val id = models.User.create(newUser)
    Redirect(routes.Application.home(id))
  }
)
```

Forms

```
import play.api.data._
import play.api.data.Forms._

case class UserData(name: String, age: Int)

val userFormConstraints2 = Form(
  mapping(
    "name" -> nonEmptyText,
    "age" -> number(min = 0, max = 100)
  )(UserData.apply)(UserData.unapply)
)

val boundForm = userFormConstraints2.bind(Map("bob" -> "", "age" -> "25"))
boundForm.hasErrors must beTrue
```

Forms

```
def index = Action {
  Ok(views.html.user(userForm))
}
```

```
@import helper._

@helper.form(action = routes.Application.userPost()) {
  @helper.inputText(userForm("name"))
  @helper.inputText(userForm("age"))
}
```

Json

```
import play.api.libs.json._

val json: JsValue = Json.parse("""
{
  "name" : "Watership Down",
  "location" : {
    "lat" : 51.235685,
    "long" : -1.309197
  },
  "residents" : [ {
    "name" : "Fiver",
    "age" : 4,
    "role" : null
  }, {
    "name" : "Bigwig",
    "age" : 6,
    "role" : "Owsla"
  } ]
}
""")
```

```
import play.api.libs.json._

val json: JsValue = Json.obj(
  "name" -> "Watership Down",
  "location" -> Json.obj(
     "lat" -> 51.235685, "long" -> -1.309197),
  "residents" -> Json.arr(
    Json.obj(
      "name" -> "Fiver",
      "age" -> 4,
      "role" -> JsNull
    ),
    Json.obj(
      "name" -> "Bigwig",
      "age" -> 6,
      "role" -> "Owsla"
    )
  )
)
```

Json

```scala
case class Location(lat: Double, long: Double)
case class Resident(name: String, age: Int, role: Option[String])
case class Place(name: String, location: Location, residents: Seq[Resident])
```

```scala
implicit val locationWrites = new Writes[Location] {
  def writes(location: Location) = Json.obj(
    "lat" -> location.lat,
    "long" -> location.long
  )
}

implicit val residentWrites = new Writes[Resident] {
  def writes(resident: Resident) = Json.obj(
    "name" -> resident.name,
    "age" -> resident.age,
    "role" -> resident.role
  )
}
```

```scala
implicit val placeWrites = new Writes[Place] {
  def writes(place: Place) = Json.obj(
    "name" -> place.name,
    "location" -> place.location,
    "residents" -> place.residents)
}

val place = Place(
  "Watership Down",
  Location(51.235685, -1.309197),
  Seq(
    Resident("Fiver", 4, None),
    Resident("Bigwig", 6, Some("Owsla"))
  )
)

val json = Json.toJson(place)
```

Json

```
val name = (json \ "name").as[String]
// "Watership Down"

val names = (json \\ "name").map(_.as[String])
// Seq("Watership Down", "Fiver", "Bigwig")

val nameOption = (json \ "name").asOpt[String]
// Some("Watership Down")

val bogusOption = (json \ "bogus").asOpt[String]
// None
```

Json

```
import play.api.libs.json._
import play.api.libs.functional.syntax._

implicit val locationReads: Reads[Location] = (
  (JsPath \ "lat").read[Double] and
  (JsPath \ "long").read[Double]
)(Location.apply _)

implicit val residentReads: Reads[Resident] = (
  (JsPath \ "name").read[String] and
  (JsPath \ "age").read[Int] and
  (JsPath \ "role").readNullable[String]
)(Resident.apply _)

implicit val placeReads: Reads[Place] = (
  (JsPath \ "name").read[String] and
  (JsPath \ "location").read[Location] and
  (JsPath \ "residents").read[Seq[Resident]]
)(Place.apply _)
```

Json

```
val json = { ... }

val placeResult: JsResult[Place] = json.validate[Place]
placeResult match {
  case p: JsSuccess[Place] => println("Place: " + p.get)
  case e: JsError => println("Errors: " + JsError.toFlatJson(e).toString())
}
```

Cache

```scala
Cache.set("item.key", connectedUser)
val maybeUser: Option[User] = Cache.getAs[User]("item.key")
val user: User = Cache.getOrElse[User]("item.key") {
  User.findById(connectedUser)
}
Cache.remove("item.key")
```

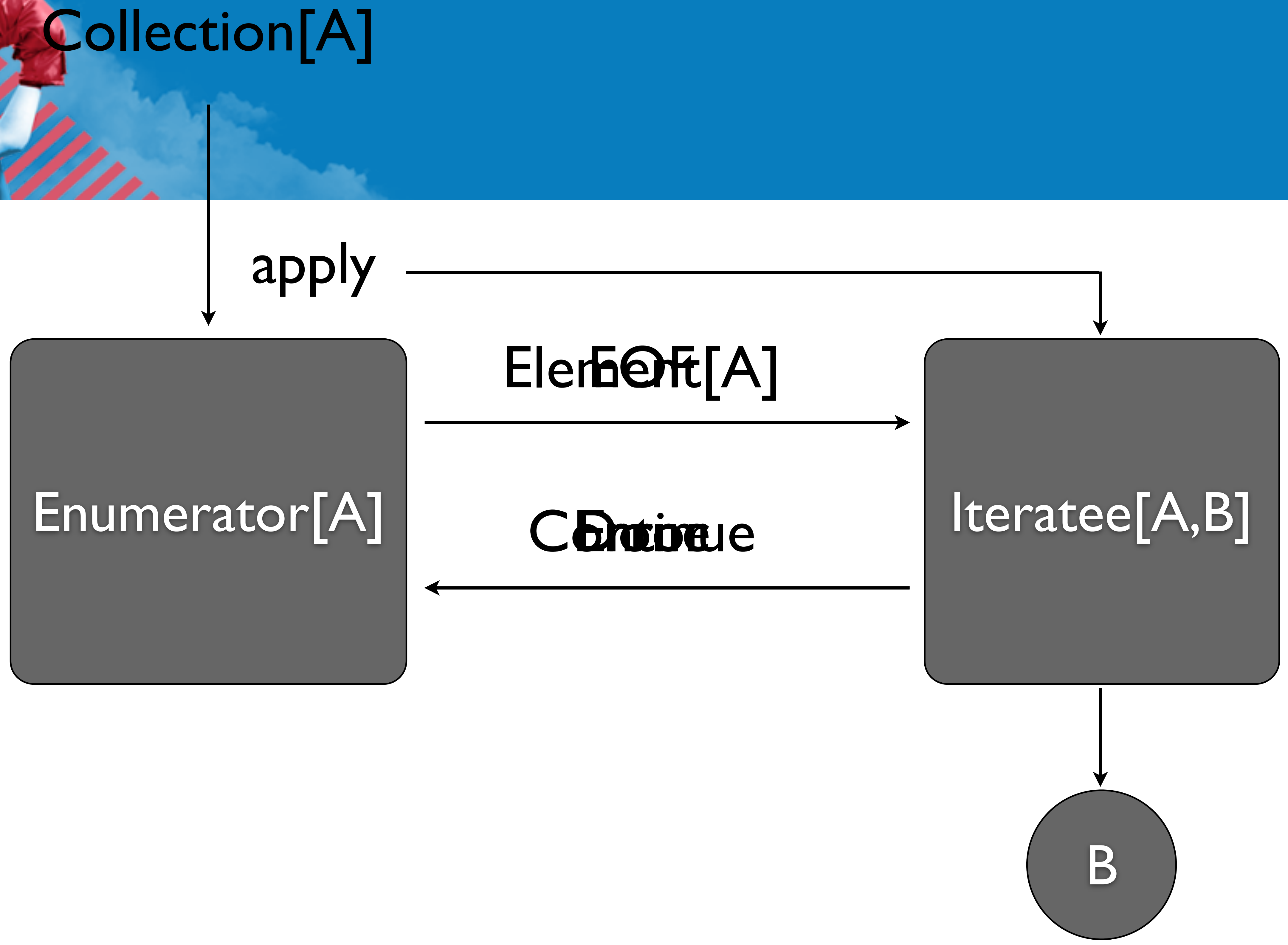
Web services

```
import play.api.Play.current
import play.api.libs.ws._
import play.api.libs.ws.ning.NingAsyncHttpClientConfigBuilder
import scala.concurrent.Future

val futureResponse: Future[WSResponse] = WS.url("http://www.google.fr/q")
    .withHeaders("Accept" -> "application/json")
     .withRequestTimeout(10000)
     .withQueryString("search" -> "play")
       .get()
```

Iteratees

- API inédite dans le monde JVM
- API de traitement et de manipulation de flux de données réactive et progressive
  - modèle de traitement commun à n'importe quel flux
  - non bloquant, asynchrone, réactif
- Utilisation pour les applications web 'temps réel'
  - Déclaration des flux puis composition
  - Réactif => push des données vers le client


Collection[A]
apply
Element[A]
EOF[A]
Enumerator[A]
Continue
Done
Error
Iteratee[A,B]
B

Exemple

```
def comet = Action {
    val events = Enumerator("kiki", "foo", "bar")
    Ok.stream(events &> Comet(callback = "parent.cometMessage"))
}
```

```
<script type="text/javascript">
  var cometMessage = function(event) {
    $('#messages').append('Received: ' + event)
  }
</script>
<div id="messages"></div>
<iframe src="/comet"></iframe>
```

Server Sent Events

```scala
def feed = Action {
    val events = Enumerator("kiki", "foo", "bar")
    Ok.feed(events &> EventSourced()).as("text/event-stream")
}
```

```javascript
var feed = new EventSource('/feed');
feed.onmessage = function (e) {
    var data = JSON.parse(e.data);
    console.log(data);
}
```

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WebSockets

```
import play.api.mvc._
import play.api.libs.iteratee._
import play.api.libs.concurrent.Execution.Implicits.defaultContext

def socket =  WebSocket.using[String] { request =>

  val (out, channel) = Concurrent.broadcast[String]

  val in = Iteratee.foreach[String] { msg =>
    println(s"received : $msg")
    channel push(s"I received your message: $msg")
  }

  (in,out)
}
```

TP

This is the end …

des questions ?