Assignment 1 Solution (UML & Code)

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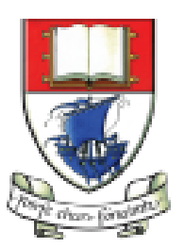

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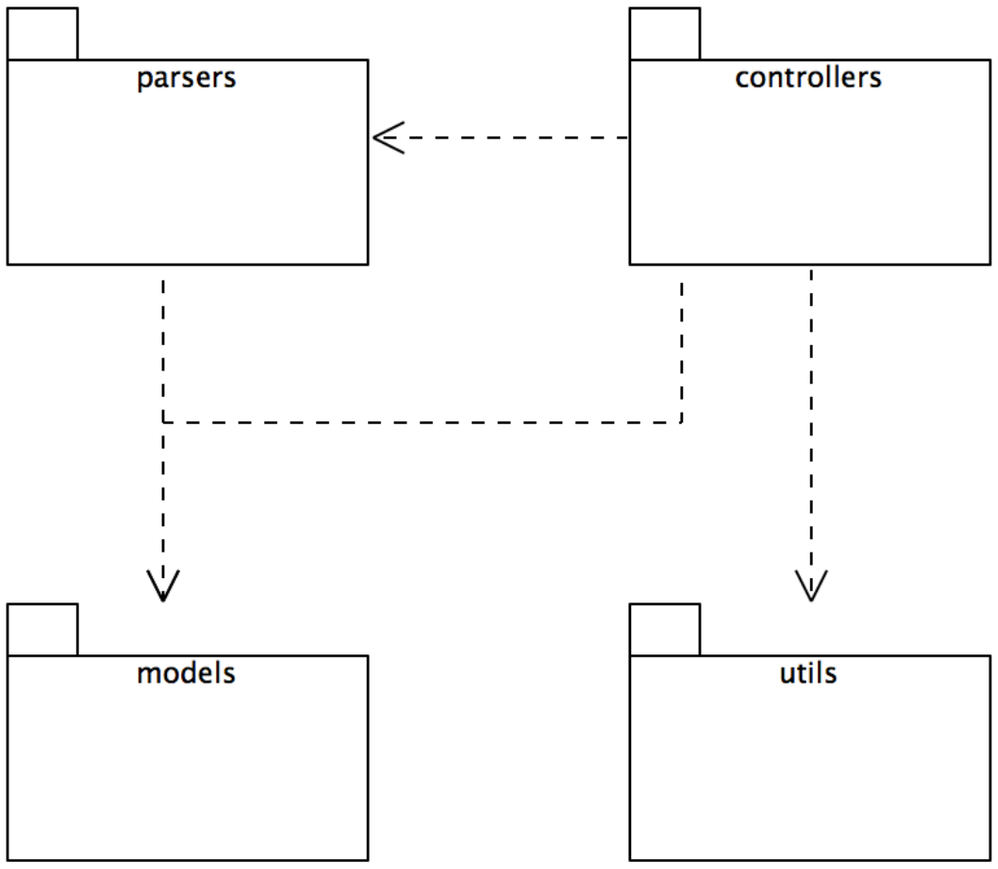
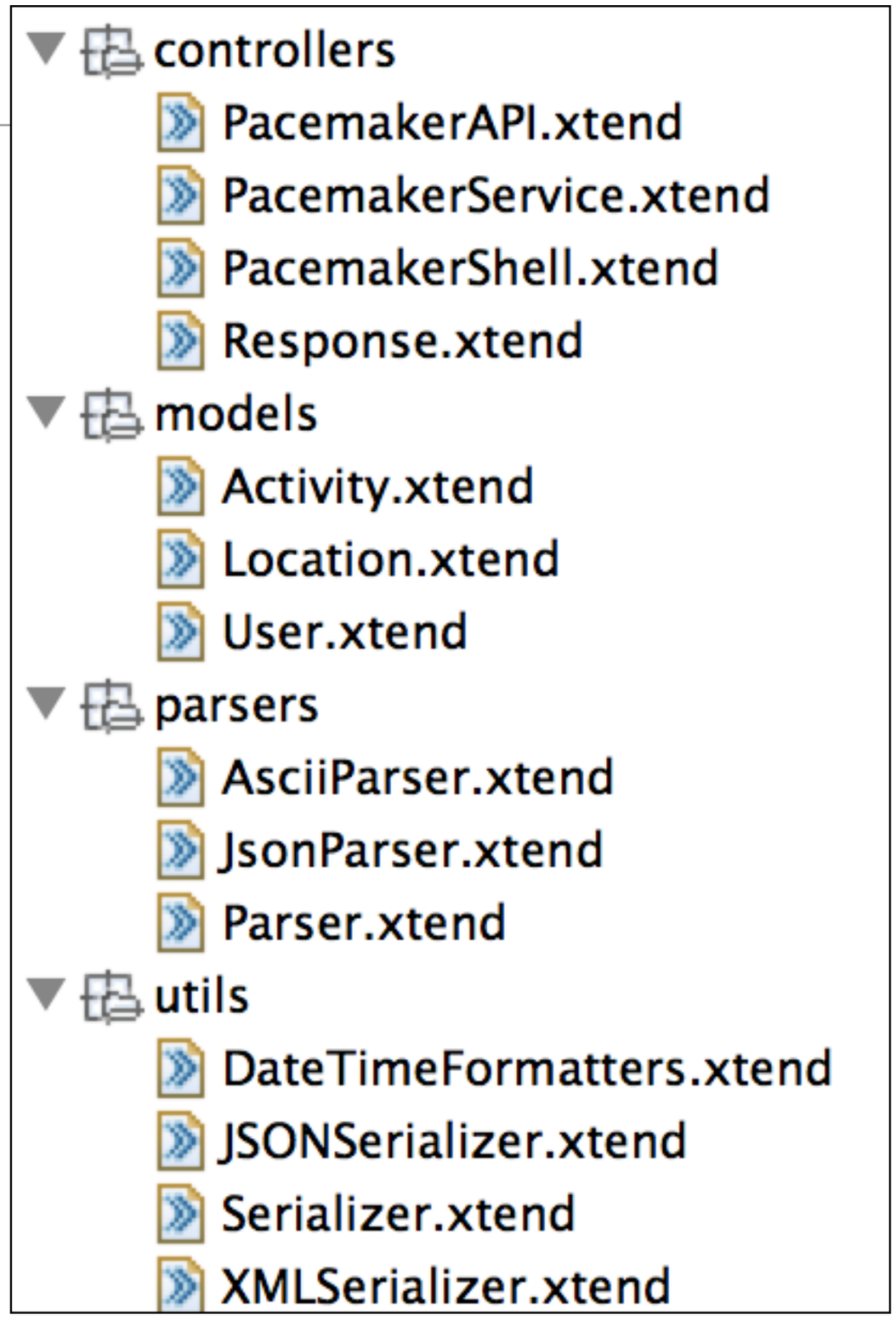
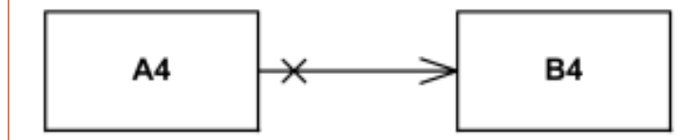
pacemaker-console-xtend

- uml package diagram



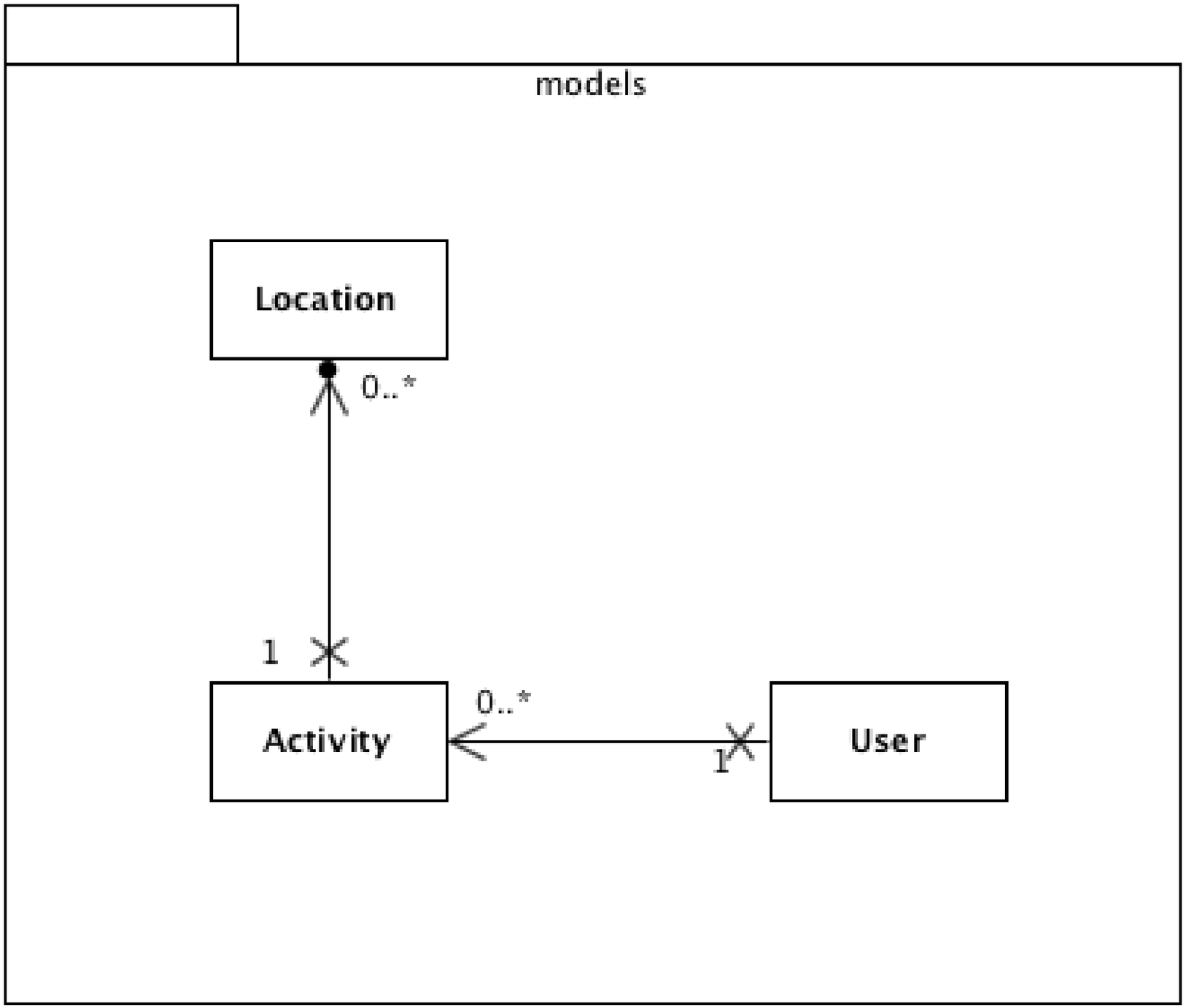


Legend: ---------> uses



*A4 is **not navigable** from B4 while B4 is **navigable** from A4.*

Legend

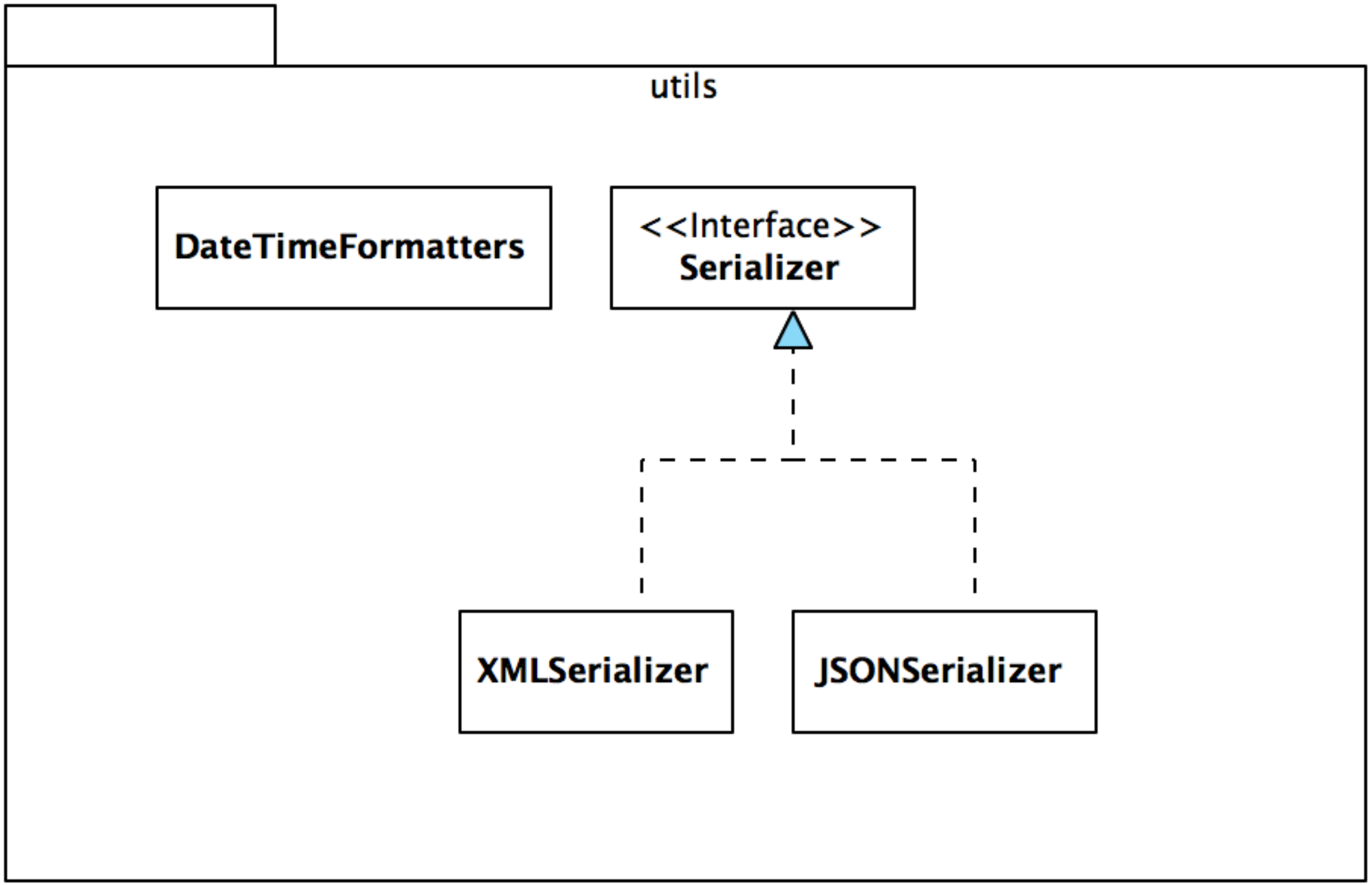


models

```
@Data class User
{
  Long   id
  String firstname
  String lastname
  String email
  String password
  @Accessors Map<Long, Activity> activities = new HashMap
}
```

```
@Data class Activity
{
  Long     id
  String   type
  String   location
  double   distance
  DateTime starttime
  Duration duration
  @Accessors List<Location> route = new ArrayList
}
```

```
@Data class Location
{
  float latitude
  float longitude
}
```


utils
DateTimeFormatters
<<Interface>>
Serializer
XMLSerializer
JSONSerializer

utils

```
interface Serializer
{
  def void push(Object o)
  def Object pop()
  def void write()
  def void read()
}
```

```
class XMLSerializer implements Serializer
{
  var Deque<Object> stack = new ArrayDeque
  val File file;

  new (String filename)
  {
    this.file = new File(filename + '.xml');
  }

  override void push(Object o)
  {
    stack.push(o)
  }

  override Object pop()
  {
    return stack.pop();
  }
```

```
override void write()
  {
    var ObjectOutputStream os = null
    try{
      val xstream = new XStream(new DomDriver())
      os = xstream.createObjectOutputStream
                        (new FileWriter(file))
      os.writeObject(stack)
    }
    finally{
      if (os != null){
        os.close
      }
    }
  }
}
```

```
@SuppressWarnings("unchecked")
 override void read() {
    var ObjectInputStream is = null
    try{
      val xstream = new XStream(new DomDriver())
      is = xstream.createObjectInputStream(
                                  new FileReader(file))
      stack = is.readObject as Deque<Object>
    }
    finally{
      if (is != null)
      {
        is.close();
      }
    }
  }
```

```
class JSONSerializer implements Serializer
{
  //  ...
  @SuppressWarnings("unchecked")
  override void read() {
    var ObjectInputStream is = null

    try{
      val xstream = new XStream(new JettisonMappedXmlDriver())
      is = xstream.createObjectInputStream(new FileReader(file))
      stack = is.readObject as Deque<Object>
    }
    finally{
      if (is != null)
      {
        is.close();
      }
    }
  }
}
```

```
override void write()  {
  var ObjectOutputStream os = null

  try{
    val xstream = new XStream(new JettisonMappedXmlDriver())
    os = xstream.createObjectOutputStream(new FileWriter(file))
    os.writeObject(stack)
  }
  finally{
    if (os != null)
    {
      os.close
    }
  }
 }
}
```

```
class DateTimeFormatters
{
  static val periodFormatter = new PeriodFormatterBuilder().printZeroAlways()
                                                           .appendHours()
                                                           .appendSeparator(":")
                                                           .appendMinutes()
                                                           .appendSeparator(":")
                                                           .appendSeconds()
                                                           .toFormatter();

  static val dateFormatter = DateTimeFormat.forPattern("dd:MM:yyyy HH:mm:ss");

  def static parseDateTime (String dateTime){
    new DateTime(dateFormatter.parseDateTime(dateTime))
  }

  def static parseDateTime (DateTime dateTime){
    dateFormatter.print(dateTime)
  }

  def static parseDuration (String duration){
      periodFormatter.parsePeriod(duration).toStandardDuration
  }

  def static parseDuration (Duration duration){
    periodFormatter.print(duration.toPeriod)
  }
}
```

parsers

<<Interface>>
UserMixin

<<Interface>>
ActivityMixin

Parser

AsciiParser

JsonParser

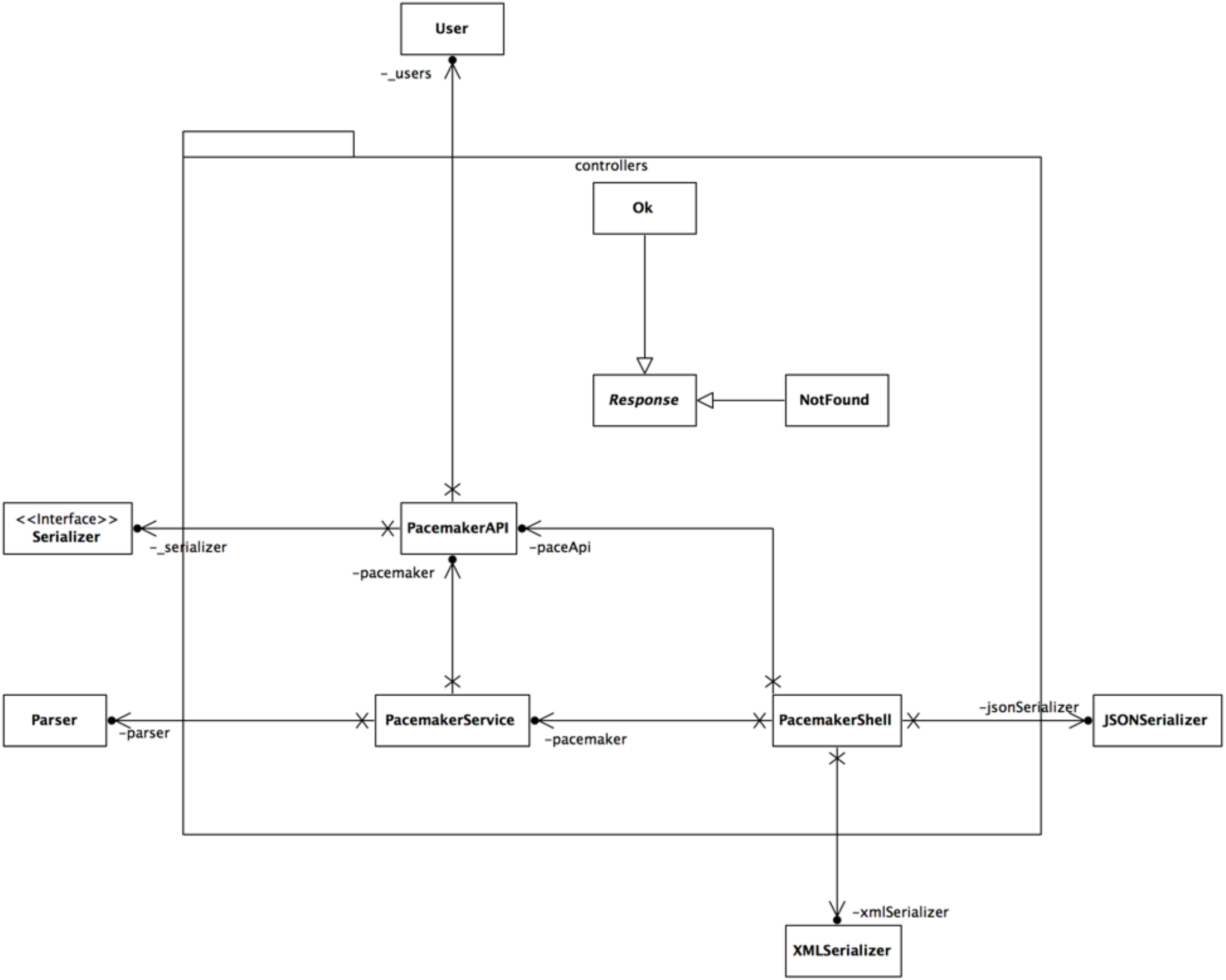
```
class Parser
{
  def String renderUser(User user)
  {
    user.toString
  }

  def String renderUsers(Collection<User> users)
  {
    users.toString
  }

  def String renderActivities(Collection<Activity> activities)
  {
    activities.toString
  }
}
```

```
class AsciiParser extends Parser
{
  override renderUser(User user)
  {
    val List<User> userList = new ArrayList()
    userList.add(user)
    renderUsers(userList)
  }

  override renderActivities(Collection<Activity> activities)
  {
    if (!activities.empty)
    {
      val List<Activity> activityList = new ArrayList(activities)
      var activitiesTable = new CollectionASCIITableAware<Activity>
                          (activityList, "id", "type", "location", "distance", "starttime", "duration", "route")
      ASCIITable.getInstance().getTable(activitiesTable)
    }
  }

  override renderUsers(Collection<User> users)
  {
    if (!users.empty)
    {
      val List<User> userList = new ArrayList(users)
      var asciiTableAware = new CollectionASCIITableAware<User>
                          (userList, "id", "firstname", "lastname", "email", "password")
      ASCIITable.getInstance().getTable(asciiTableAware);
    }
  }
}
```

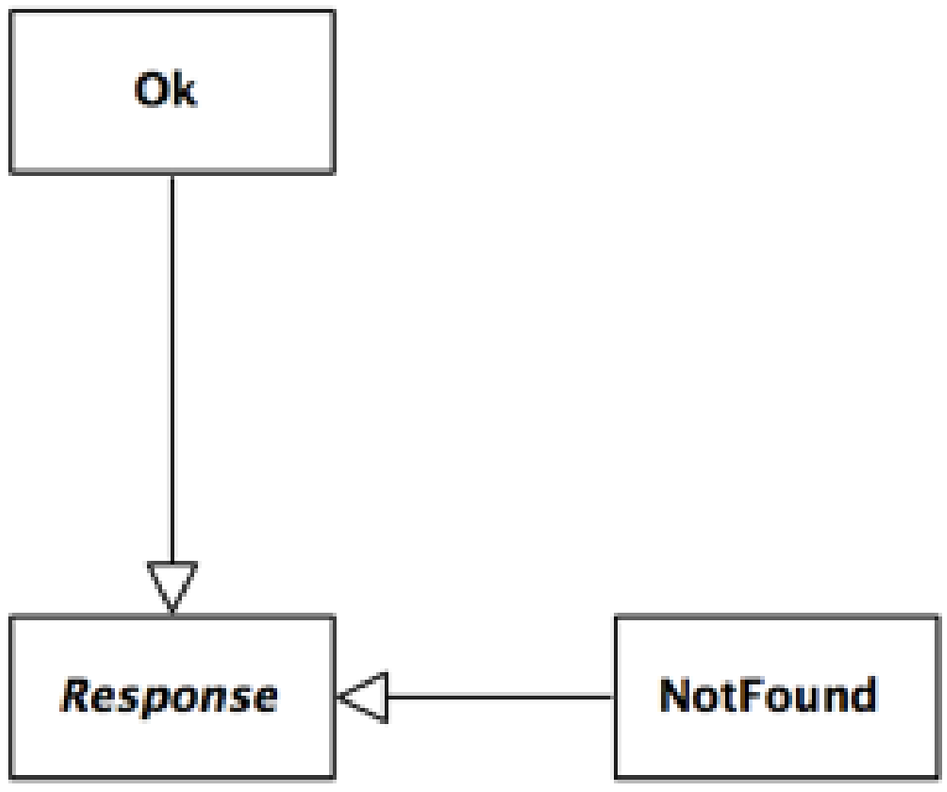
```
interface UserMixin{
  @JsonIgnore def String getActivities()
  @JsonIgnore def Long getId()
}
```

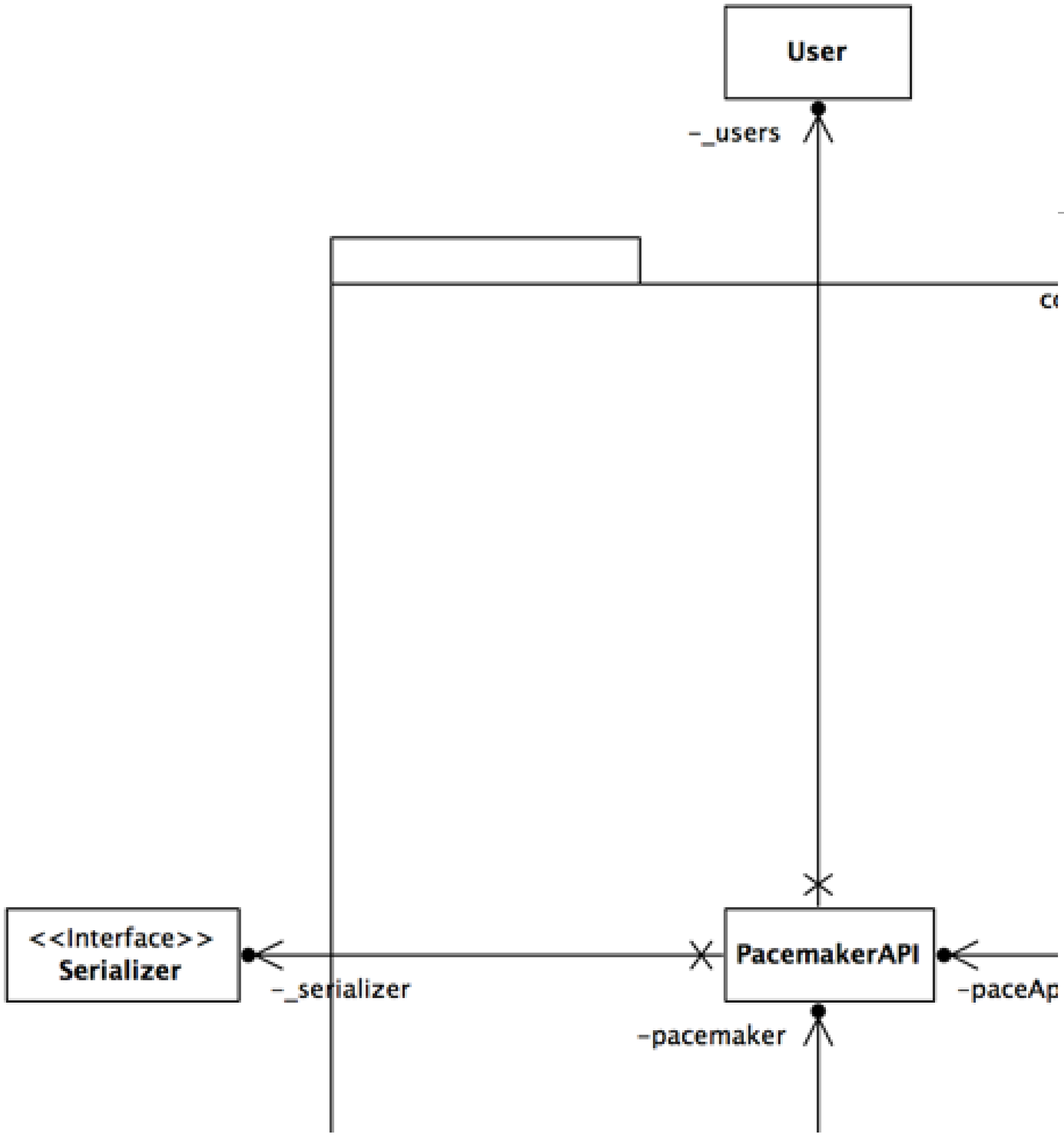
```
interface ActivityMixin{
  @JsonIgnore def Long getId()
}
```

```
class JsonParser extends Parser{
  val mapper = new ObjectMapper()

  new(){
    mapper.addMixInAnnotations(typeof(User),     typeof(UserMixin))
    mapper.addMixInAnnotations(typeof(Activity), typeof(ActivityMixin))
  }

  override renderUser(User user){
      mapper.writerWithDefaultPrettyPrinter.writeValueAsString(user)
  }

  override renderActivities(Collection<Activity> activities){
    if (activities.size > 0){
      mapper.writerWithDefaultPrettyPrinter.writeValueAsString(activities)
    }
  }

  override renderUsers(Collection<User> users){
    mapper.writerWithDefaultPrettyPrinter.writeValueAsString(users)
  }
}
```


User
-_users
controllers
Ok
Response
NotFound
<<Interface>>
Serializer
-_serializer
PacemakerAPI
-paceApi
-pacemaker
Parser
-parser
PacemakerService
-pacemaker
PacemakerShell
-jsonSerializer
JSONSerializer
-xmlSerializer
XMLSerializer

```
abstract class Response {
    var String response

    new(String response){
        this.response = response
    }

  override toString(){
        response
    }
}

class Ok extends Response{
    new (String response){
        super("ok\n" + response)
    }
}

class NotFound extends Response{
     new (String response) {
        super("not found\n")
     }
}
```

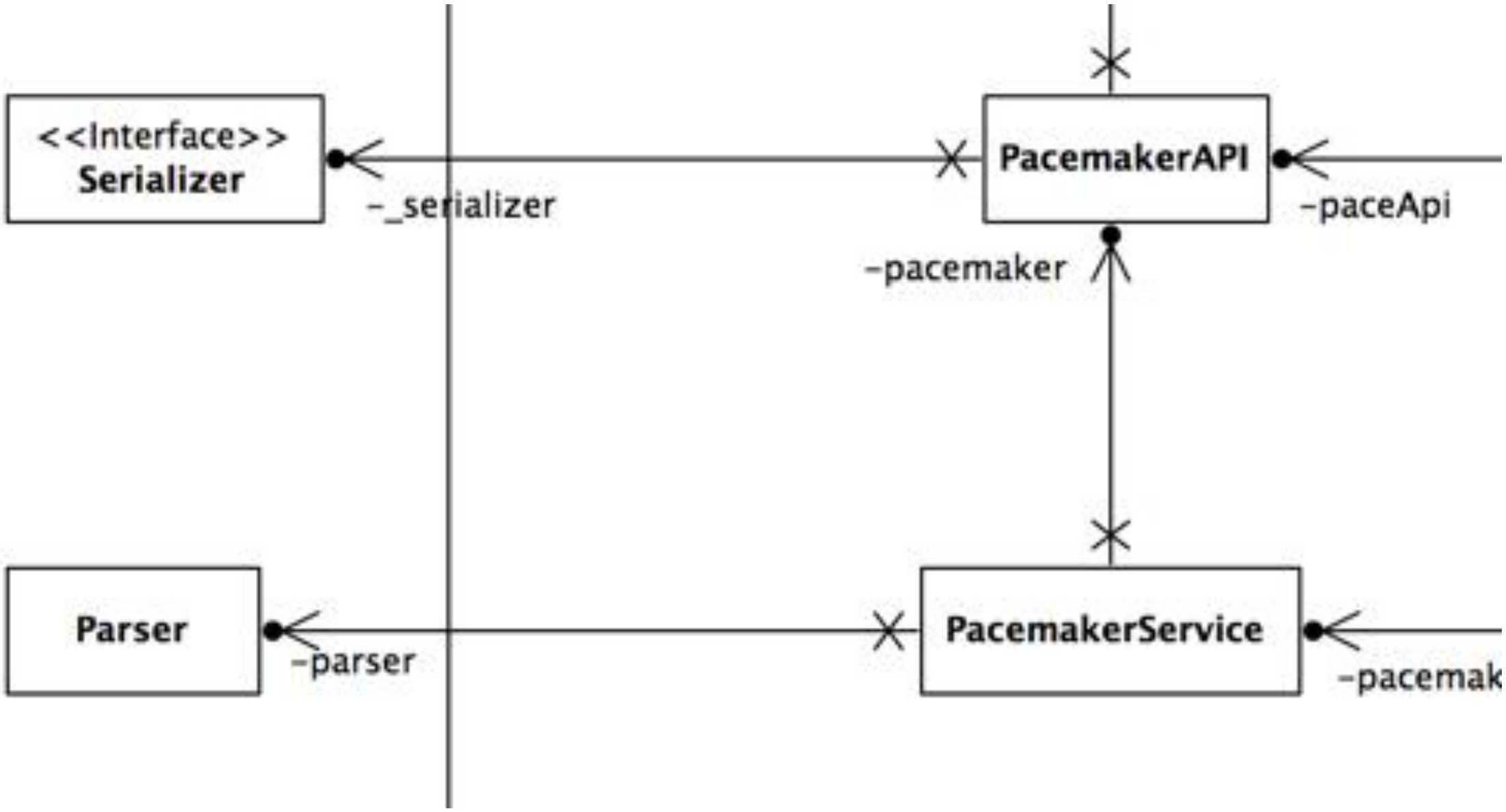



User
-_users
<<Interface>>
Serializer
-_serializer
PacemakerAPI
-pacemaker
-paceAp

```
class PacemakerAPI
{
  static long userIndex = 0;
  static long activityIndex = 0;

  var Map<Long,   User>     userMap      = new HashMap
  var Map<String, User>     userEmailMap = new HashMap
  var Map<Long,   Activity> activityMap  = new HashMap

  @Property Collection<User> users      = userMap.values
  @Property Serializer       serializer

  new()
  {
    userIndex = 0
    activityIndex = 0
  }

  def void load() throws Exception
  {
    serializer.read();
    activityIndex = serializer.pop() as Long
    userIndex     = serializer.pop() as Long
    activityMap   = serializer.pop() as Map<Long, Activity>
    userEmailMap  = serializer.pop() as Map<String, User>
    userMap       = serializer.pop() as Map<Long, User>
    users         = userMap.values
  }

  def void store()
  {
    serializer.push(userMap)
    serializer.push(userEmailMap)
    serializer.push(activityMap)
    serializer.push(userIndex)
    serializer.push(activityIndex)
    serializer.write()
  }
```

```
def Long createUser (String firstName, String lastName, String email, String password)
{
  userIndex = userIndex + 1
  var user = new User (userIndex, firstName, lastName, email, password)
  userMap.put(userIndex, user);
  userEmailMap.put(user.email, user)
  userIndex
}

 def getUser (Long id)
 {
   userMap.get(id)
 }

 def getUser (String email)
 {
   userEmailMap.get(email)
 }

 def deleteUser (Long id)
 {
   userEmailMap.remove(userMap.get(id))
   userMap.remove(id)
 }

 def deleteUser (String email)
 {
   val user = userEmailMap.remove(getUser(email))
   userMap.remove(user.id)
 }
```

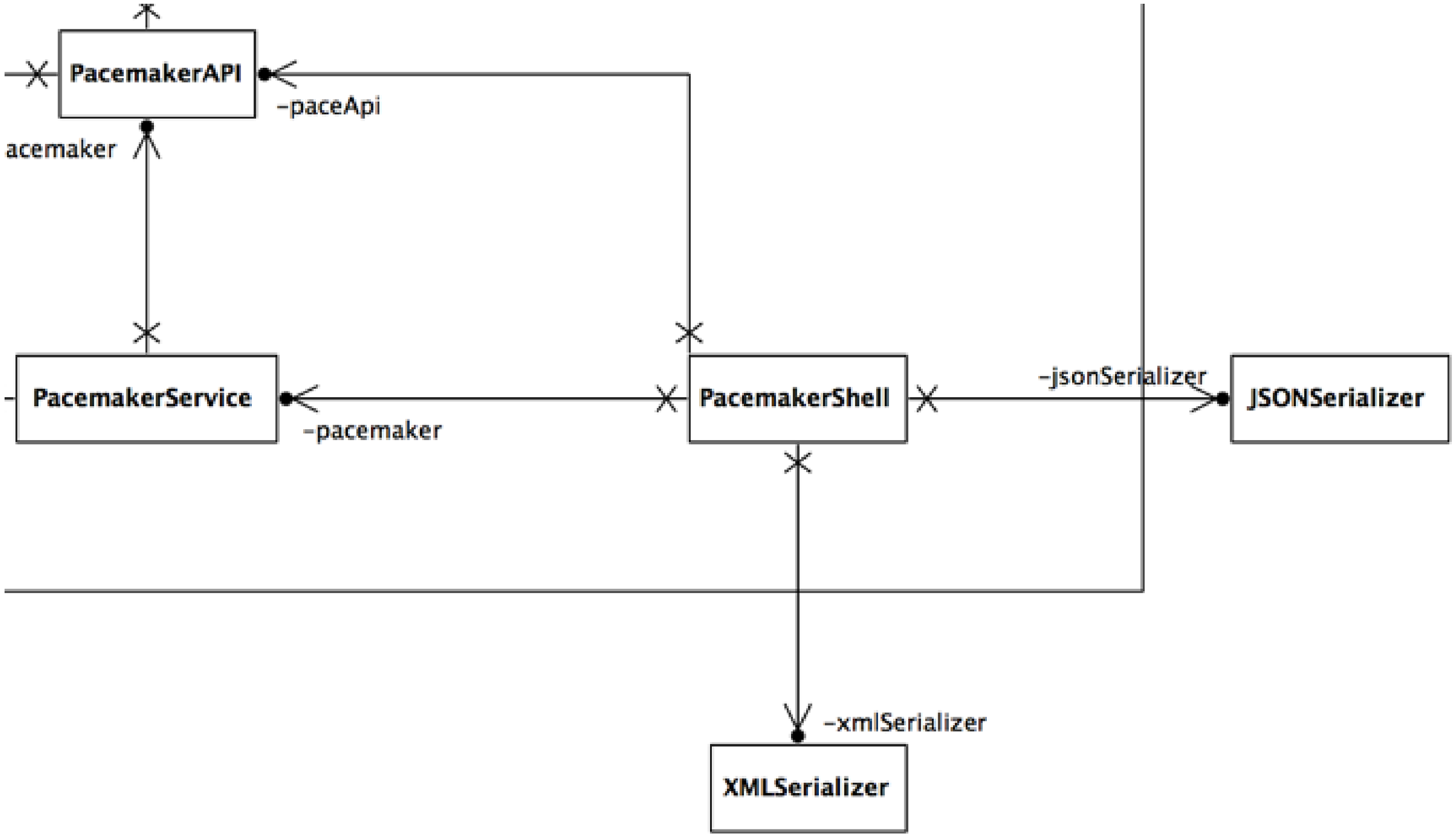
```
def Activity createActivity(Long id, String type, String location, double distance,
                                                    String dateStr, String durationStr)
{
  var Activity activity = null;
  var user = Optional.fromNullable(userMap.get(id))
  if (user.isPresent())
  {
    activityIndex = activityIndex + 1
    activity = new Activity (activityIndex, type, location, distance,
                                          parseDateTime(dateStr), parseDuration(durationStr))
    user.get.activities.put(activity.id, activity);
    activityMap.put(activity.id, activity);
  }
  return activity;
}

def getActivity (Long id)
{
  activityMap.get(id)
}

def void addLocation (Long id, float latitude, float longitude)
{
  val activity = Optional.fromNullable(activityMap.get(id))
  if (activity.isPresent())
  {
    activity.get.route.add(new Location(latitude, longitude));
  }
}
```


<<Interface>>
Serializer
-_serializer
PacemakerAPI
-paceApi
-pacemaker
Parser
-parser
PacemakerService
-pacemak

```
class PacemakerService{
  var PacemakerAPI pacemaker
  var Parser       parser

  new(PacemakerAPI pacemaker, Parser parser){
    this.pacemaker = pacemaker
    this.parser = parser
  }

 def createUser(String firstname, String lastname, String email, String password) {
    val id = pacemaker.createUser(firstname, lastname, email, password)
    new Ok(parser.renderUser(pacemaker.getUser(id)))
  }

  def  getUser(Long id) {
       val user = pacemaker.getUser(id)
       if (null != user) new Ok(parser.renderUser(user)) else new NotFound("")
  }

  def  getUser(String email) {
       val user = pacemaker.getUser(email)
       if (null != user) getUser(user.id) else new NotFound("")
  }

  def getUsers(){
       new Ok(parser.renderUsers(pacemaker.users))
  }

  def deleteUser(Long id){
       val user = pacemaker.getUser(id)
       pacemaker.deleteUser(user?.id)
       if (null != user) new Ok("") else new NotFound("")
  }
```

```
def createActivity(Long id, String type, String location, double distance, String dateStr, String durationStr)
{
    if (null != pacemaker.getUser(id))
    {
      pacemaker.createActivity(id, type, location, distance, dateStr, durationStr)
      new Ok("")
     }
     else new NotFound("")
}

def getActivities(Long id)
{
    val user = pacemaker.getUser(id)
    if (null != user) new Ok(parser.renderActivities(user.activities.values)) else new NotFound("")
}

def addLocation (Long id, float latitude, float longitude)
{
    val activity = pacemaker.getActivity(id)
    if (null != activity)
    {
    pacemaker.addLocation(id, latitude, longitude)
    new Ok("")
    }
    else new NotFound("")
}
```

```
def listActivities (Long id, String sortBy)
{
  val activities = pacemaker.getUser(id).activities.values

  val report = switch (sortBy)
  {
    case "type"          : activities.sortBy[type]
    case "location"      : activities.sortBy[location]
    case "distance"      : activities.sortBy[distance]
    case "date"          : activities.sortBy[starttime]
    case "duration"      : activities.sortBy[duration]
  }
  return new Ok(parser.renderActivities(report))
}
```


PacemakerAPI
-paceApi
acemaker
PacemakerService
-pacemaker
PacemakerShell
-jsonSerializer
JSONSerializer
-xmlSerializer
XMLSerializer

```
class PacemakerShell
{
  var PacemakerAPI       paceApi
  var PacemakerService   pacemaker
  val datastore          = "testdatastore";
  val xmlSerializer      = new XMLSerializer(datastore);
  val jsonSerializer     = new JSONSerializer(datastore);

  new()
  {
    paceApi = new PacemakerAPI;
    paceApi.serializer = xmlSerializer
    pacemaker = new PacemakerService (paceApi, new AsciiParser as Parser)
  }

  @Command(description="List all users details")
  def void listUsers ()
  {
    println(pacemaker.getUsers)
  }

@Command(description="Create a new User")
def void createUser (@Param(name="first name") String firstname, @Param(name="last name") String lastname,
                     @Param(name="email")      String email,     @Param(name="password")  String password)
{
  println (pacemaker.createUser(firstname, lastname, email, password))
}

@Command(description="List a users details")
def void listUser (@Param(name="email") String email)
{
    println (pacemaker.getUser(email))
}

@Command(description="List a users details")
def void listUser (@Param(name="id")  Long id)
{
    println (pacemaker.getUser(id))
}`
```

```
@Command(description="List a users activities")
 def void listActivities (@Param(name="user id") Long id)
{
     println (pacemaker.getActivities(id))
}

 @Command(description="Delete a User")
 def void deleteUser (@Param(name="id") Long id)
{
  println (pacemaker.deleteUser(id))
}

 @Command(description="Add an activity")
 def void addActivity (@Param(name="user-id")  Long   id,      @Param(name="type") String type,
                    @Param(name="location") String location, @Param(name="distance") double distance,
                    @Param(name="datetime") String dateStr,  @Param(name="duration") String durationStr
                    )
{
     try
     {
    println (pacemaker.createActivity(id, type, location, distance, dateStr, durationStr))
     }
     catch (IllegalArgumentException e)
     {
           println ("Date or Duration format error: " + e.message)
     }
}

 @Command(description="Add Location to an activity")
 def void addLocation (@Param(name="activity-id")  Long  id,
                    @Param(name="latitude")     float latitude, @Param(name="longitude") float longitude)
{
  println (pacemaker.addLocation(id, latitude, longitude))
}
```

```
@Command(description="List Activities")
def void listActivities (@Param(name="userid") Long id,
          @Param(name="sortBy: type, location, distance, date, duration") String sortBy)
{
    val options = #{"type", "location", "distance", "date", "duration"}
    if (options.contains(sortBy))
    {
     println (pacemaker.listActivities(id, sortBy))
   }
   else
     println ("usage : la " + options.toString)
}
```

```
@Command(description="Set file format")
def void changeFileFormat (@Param(name="file format: xml, json") String fileFormat)
{
  switch (fileFormat)
  {
    case 'xml'  : paceApi.serializer = xmlSerializer
    case 'json' : paceApi.serializer = jsonSerializer
  }
}

@Command(description="Load activities persistent store")
def void load ()
{
  paceApi.load
}

@Command(description="Store activities persistent store")
def void store ()
{
  paceApi.store
}

def static void main(String[] args) throws Exception
{
  val main = new PacemakerShell()

  val shell = ShellFactory.createConsoleShell("pm", "Welcome to pacemaker-console - ?help for instructions", main)
  shell.commandLoop

  main.paceApi.store
}
```