



JPOS[™] Presentation Manager

Quick Guide v1.5

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1 Abstract

This document is intended to be a fast guide to use jPOS Presentation Manager so, you will not have a detailed description or justification of the methodology here. Before starting with this document please read [jPOS Project Guide](#) and the [jPOS Programmer's Guide](#). This document assumes that you have basic knowledge about jPOS, jPOS-EE and the documents above mentioned. It is also recommended to have a basic knowledge about JSP and Struts1.

2 Copyright

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3 Quick guide

3.1 Revision History

Date	Author	Version	Notes
13/06/10	J. Paoletti	1.0	Started document
02/07/10	J. Paoletti	1.1	Some corrections. Added external location.
04/07/10	J. Paoletti	1.2	Minor fixes. Added Operation Context description.
24/07/10	J. Paoletti	1.3	Adjustments on validators section. Added order property to entities. Added security section content. Added monitor section content.
29/07/10	J. Paoletti	1.4	Added chapter numeration
01/02/11	J. Paoletti	1.5	Added external converters
04/09/11	J. Paoletti	1.6	Updated a lot of stuff

3.2 Before Starting

If you use GIT you can get the submodules right from github.com. You can do so with the following commands inside your already initialized git local repository:

```
git submodule add git://github.com/jpaoletti/jpospm_core.git modules/jpospm_core
git submodule add git://github.com/jpaoletti/jpos_web_lib.git modules/jpos_web_lib
git submodule add git://github.com/jpaoletti/jpospm_struts.git
modules/jpospm_struts
git submodule add git://github.com/jpaoletti/jpos_jetty7.git modules/jpos_jetty7
git submodule add git://github.com/jpaoletti/jpospm_core_db.git modules/jpospm_core_db
git submodule add git://github.com/jpaoletti/jpospm_security_ui.git modules/jpospm_security_ui

git submodule init
git submodule update
```

Modules **jpos_web_lib**, **jpospm_struts** and **jpos_jetty7** are optional but needed to use PM Struts implementation.

Module **jpospm_core_db** is needed to use PM with a Data Base connection as Data Access.

Module **jpospm_security_ui** is a set of entity definition that implements a visualization for PM security objects. Is useful as is and as example.

Also, the following jPOS modules are required

- commons
- jpos
- constants

You can use the subversion repository but it is usually not up-to-date so use it at your own risk

<http://code.google.com/p/jpospm/>

Note that an example of the PM can be downloaded at <http://github.com/jpaoletti/jPOS-PM-Test> to show most of the functions.

3.3 Starting

As first step I highly recommend to create a new folder in your modules directory named “project_ui”. Inside it create the following folder structure:

```
modules
  → project_ui
    → src
    → deploy
    → cfg
      → entities
      → monitors
    → webapps
      → pm
        → templates
```

Once you have this folders, you must create this “must have” files.

3.3.1 Location Files

Locations are a complex concept. It will be explained somewhere else. This file must have at last the following content.

cfg/pm.locations.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE menu SYSTEM "locations.dtd">
<locations>
<location id="pmstruts" class="org.jpos.ee.pm.struts.MenuItemLocationStruts"/>
<location id="external" class="org.jpos.ee.pm.struts.MenuItemLocationExternal"/>
</locations>
```

3.3.2 Menu File

This is the menu. Nesting is arbitrary and *perm* property only applies if you use pm_security.

cfg/pm.menu.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE menu SYSTEM "menu.dtd">
<menu>
  <menu-list text="pm.menu.list.xxxx" perm="">
    <menu-list text="pm.menu.item.xxxx" perm="">
      <menu-item text="pm.menu.item.xxxx" perm="">
        <location id="pmstruts" value="/list.do?pmid=yyyy" />
      </menu-item>
      <menu-item text="pm.menu.item.yyyy" perm="">
        <location id="external" value="http://jpos.org" />
      </menu-item>
    </menu-list>
  </menu-list>
</menu>
```

Each “text” is an entry key in the application resource file. The “perm” is the permission needed to see this menu option when using security.

The location is the way the menu builds the menu. **pm_struts** has two locations, one for internal use of pm entities and one for external calls to another pages.

3.3.3 Jetty File

Jetty file defines port used by web application. Just copy

```
modules/jetty7/cfg/jetty.xml.sample
```

to

```
modules/project_ui/cfg/jetty.xml
```

3.3.4 Application Resources

This file is where all the text will live.

```
cfg/ApplicationResource.properties
```

```
main.title=Some Title
main.subtitle=Some Subtitle
...
```

3.3.5 QBean

The bean file must be created in the application deploy folder and is the “running” part of PM. The definition must be something like:

```
deploy/80_pm.xml
```

```
<presentation-manager class="org.jpos.ee.pm.struts.PMStrutsService" logger="Q2">
  <property name="debug" value="false" />
  <property name="template" value="default" />
  <property name="appversion" value="1.0.0" />
  <property name="login-required" value="true" />
  <property name="ignore-db" value="false" />
  <property name="title" value="main.title" />
  <property name="copyright" value="jpos.org" />
  <property name="contact" value="some@mail.org" />
  <property name="subtitle" value="main.subtitle" />
  <property name="default-data-access" value="org.jpos.ee.pm.core.DataAccessDB"/>
  <property name="persistence-manager"
    value="org.jpos.ee.pm.core.DBPersistenceManager"/>
  <property name="session-timeout" value="900" />
  <property name="menu" value="cfg/struts.menu.xml" />

  <!-- Struts Specific -->
  <property name="hideable-header" value="true" />
  <property name="struts-ignored-extensions" value="css,gif,png,jpg,js" />
  <property name="welcome-page" value="someNotIndex.jsp" />
</presentation-manager>
```



```

<!-- External Converters -->
<property name="external-converters" value="cfg/econverters.all.xml" />
<!-- ... -->

<!-- Busissnes Entities -->
<property name="entity" value="cfg/entities/xxxx.xml" />
<!-- ... -->

<!-- Monitors -->
<property name="monitor" value="cfg/monitors/q2.xml" />
<!-- ... -->
</presentation-manager>

```

debug	Activate some debugs
template	Name of the folder containing the template to uses. Default uses modules/pm_struts/webapps/templates/default . A good practice is to copy this folder (full path) inside your project module to create your own template.
appversion	Version shown in main page of your application
login-required	If true the application uses authentication.
ignore-db	If true, the application ignores everything related to Data Base access.
title	ApplicationResource key for the title
subtitle	ApplicationResource key for the subtitle
default-data-access	Default entity Data Access
copyright	Copyright text
session-timeout	Session timeout in milliseconds
menu	Path to menu file
contact	Contact mail
default-converter	With this option, the default converter can be changed. Not recommended.
hideable-header	If true, menu bar and header can be hidden with a button
struts-ignored-extensions	A comma separated list with the extensions that will be ignored by the general filter when processing the http servlet so none of this extensions will have context processing
welcome-page	A JSP page or struts action to change the index
external-converter*	One or more external converters definition files
entity*	One or more entities files
monitor*	One or more monitor files

3.3.6 Template

It is recommended to copy the default template (located at pm_struts module modules/pm_struts/webapps/pm/templates/default) into your own module, preserving the path but changing the name of the final folder. Something like:

```
cp -r modules/pm_struts/webapps/pm/templates/default
modules/project_ui/webapps/pm/templates/mytemplate
```

You should configure your Qbean file as

```
<property name="template" value="mytemplate" />
```

After that, you can freely change the style of the site by modifying the css and images inside your folder.

3.3.7 Startup Log

When starting, Q2 server will show up some log for presentation manager. This log is something like:

```
<log realm="org.jpos.ee.pm.struts.PMStrutsService" ...>
  <info>
    <startup>Presentation Manager activated</startup>
    <configuration>
      (*) Template mytemplate
      (*) Default Data Access org.jpos.ee.pm.core.DataAccessDB
      (*) Application version 1.0.0.0
      (*) Title pm.title
      (*) Subtitle pm.subtitle
      (*) Contact mailto:jpaoletti@angras.com.ar
      (*) Login Required false
      (*) Persistence Manager org.jpos.ee.pm.core.XXX
    </configuration>
    <entities>
      (*) sysconfig org.jpos.ee.SysConfig
      ...
    </entities>
    <monitors>
      (*) q2 org.jpos.ee.pm.core.monitor.FileMonitorSource
      (*) status org.jpos.ee.pm.core.monitor.SQLMonitorSource
      ...
    </monitors>
    <locations>
      (*) pmstruts org.jpos.ee.pm.struts.MenuItemLocationStruts
      (*) external org.jpos.ee.pm.struts.MenuItemLocationExternal
    </locations>
  </info>
</log>
```

Reference:

```
(*) Item correctly loaded.
(.) Weak entity correctly loaded.
(?) Item correctly loaded but with an unknown class.
(!) Item with error. Look for the exception in previous log.
```

3.4 Entities

The entities files are recommended to go in **cfg/entities** of your ui module. General definition of an entity is:

```
<?xml version='1.0' ?>
<!DOCTYPE entity SYSTEM "cfg/entity.dtd">
<entity id="anentity" clazz="org.jpos.ee.SomeClass" extendz="otherentity" no-
count="false">
  <dataAccess class="org.jpos.ee.pm.editor.DataAccessEntity" />
  <listFilter class="xxx" />
  <order>...</order>
  <highlights>...</highlights>
  <operations>...</operations>
  <field.../>
</entity>
```

id	Id of the entity. Must be global unique
clazz	Class of the represented object
extendz	Optional entity id to extends its fields
no-count	If true, no operation use the “count” method of the data access. It has been made for entities with a large amount of instances.
dataAccess	Overrides the default data access.
operations	A list of avaible operations for this entity.
field*	The list of fields of the entity.
ListFilter	Is an implementation of EntityFilter interface to filter the content of the list operation. In a near future, this will be a property of the operation list.
Order	String with a list of field ids that determine the order of the fields. May be separated with any separator. If a field is not included it goes to the tail.

The name of the entity is determined by the following line in the application resource file:

```
pm.entity.entityid=Some name
```

It is recommended to save the file with the id of the entity as the filename. In this case

```
cfg/entities/entityid.xml
```

Before an entity become available, you must add the following line in deploy/80_pm.xml file

```
<property name="entity" value="cfg/entities/entityid.xml" />
```

3.4.1 Weak-entity

A weak-entity is an entity hardly dependent of another entity. That means that it only exists if the other entity contains it and cannot exists alone.

```
<entity id="..." clazz="...">
  <owner>
    <entityId>xxxxx</entityId>
    <entityProperty>xxxxx</entityProperty>
    <entityCollectionClass>java.util.ArrayList</entityCollectionClass>
    <localProperty>xxxxx</localProperty>
    <localPosition>xxxxx</localPosition>
  </owner>
  ....
</entity>
```

entityId	Parent entity id
entityProperty	Parent entity field that points to a collection of weak entity instances
entityCollectionClass	Class of the entity parent collection of weak entity instances
localProperty	Optional, entity field pointing to parent
localPosition	Optional, entity field index for parent collection. Only needed in indexed collections.

3.4.2 Highlights

Highlights are a way to make some items stress on others on any operation but specially in list.

```
<entity id="..." clazz="...">
  <highlights>
    <highlight field="xxx" value="xxx" style="xxx" scope="xxx" />
  </highlights>
</entity>
```

field	Id of the field that will be checked for highlight
value	Value to determine if the highlight is applied
style	Internal codification for styling. Struts module implement this as html classes.
scope	Could be “instance” (highligh all the instance) or “property” (just highlight the field)

3.5 Operations

3.5.1 Definition

Operations are the “things” you can do with an entity instance. For example, you can *list* the instances, *add* a new one, *edit* an existing, *delete* one, *sort* the list, *filter* the list and so on.

Each operation may have its own properties and may show a confirmation dialog before execute.

```
<entity id="..." clazz="...">
<operations>
  <operation id="xxx" scope="xx" display="xx" enabled="xx" confirm="xx">
    <context class="xxx" />
    <properties>
      <property name="xxx" value="xxx"/>
      ...
    </properties>
  </operation>
  ...
</operations>
</entity>
```

3.5.2 Configuration

id	Unique global id. The same operation may be used on more than one entity but just once on the same entity.
scope	item general . Item affects only one entity instance. General affects none of any instances.
display	Operations id where this operation will be shown
enabled	true false . Determine if the operation is enabled. Disabled operations are not showed.
confirm	true false . Determine if a previous confirmation is needed.
properties	Operation specific properties

3.5.3 Context

A context may be defined for each operation. A context is a class implementing OperationContext or extending OperationContextSupport with three methods.

```
/** This method is executed at the very beginning of the process, before converting
or replace any
 * data on objects. */
public void preConversion (PMContext ctx) throws PMException;

/**This method is executed before trying to execute the main method of the
 * operation, that is before opening any transaction.
 * @param ctx The context
```

```

*/
public void preExecute (PMContext ctx) throws PMException;

/**This method is executed after the main method of the operation.
 * @param ctx The context
 */
public void postExecute (PMContext ctx) throws PMException;

```

3.5.4 Predefined Operations

- **list.** Have the following properties
 - **searchable:** Add a little search
 - **paginable:** Add pagination for the list
 - **show-row-number:** Shows a little number near each row
 - **operation-column-width:** Width of the first column of the list table
 - **sort-field:** Id of the field taken for sorting
 - **sort-direction:** asc / desc
- **show**
- **add**
- **edit**
- **delete**
- **sort**
- **filter**
- **clearfilter**

3.5.5 Custom Operations

NOTE: This is only for Struts implementation

In **pm_core**, operations are just a definition. The PM implementation must define a way to “execute” this operations. In **pm_struts**, each operation is defined as an action with the path defined as the operation id. To define a new operation (lets say, named **myoper**) in **pm_struts** you need to do the following steps.

3.5.5.1 Define the Action

You need to create the following file in your module and append the following text.

cfg/struts.actions

```

<action path="/myoper" type="org.jpos.ee.pm.struts.actions.MyOperAction">
  <forward name="success" path="/pages/myoper.jsp"/>
</action>

```

This will add the new action. If you need to define an **FormBean** (remember that this is **Struts 1**) you can add it in the file **cfg/struts.bean**. If you want to add a global forward, you can do it in **cfg/struts.fwds**.

3.5.5.2 Define the Action class

This may not be necessary as your action can be defined as a forward, but, if you need to, there is some help. In any case, you need extend your class from **org.jpos.ee.pm.struts.actions.ActionSupport** and

implement `doExecute` method and most of time it will look something like this:

```
@Override
protected void doExecute(PMStrutsContext ctx) throws PMException {

    final MyOperOperation op = new MyOperOperation("myoper");

    if (!op.execute(ctx)) {
        throw new PMForwardException(CONTINUE);
    }
}
```

If this method ends without exceptions, then “success” forward is returned. If you want to return another forward, you can throw the following exception:

```
throw new PMForwardException("someforward");
```

If the operation returns false it indicates that it's not finished and something else must be done before success. This is the common case of editing. First you need to show the edition page and after that you are done. This is a two-step operation.

You can also throw a `org.jpos.ee.pm.struts.PMForwardException` to forward to a not defined forward.

`MyOperOperation` must implement `org.jpos.ee.pm.core.operations.OperationCommand` interface or, better and recommended, extend from `org.jpos.ee.pm.core.operations.OperationCommandSupport`. This class provides almost any needed behavior.

You can override the following protected methods to change the default behavior:

```
/** Default true. Throws an UnauthorizedException if there is no user logged */
protected boolean checkUser(){
    return false;
}
/** Default false. Opens a Data Access transaction before doExecute */
protected boolean openTransaction() {
    return false;
}
/** Default false. Forces execute to check if there is a selected item */
protected boolean checkSelected() {
    return true;
}
/** Default false. Forces execute to check if there is an entity defined in parameters*/
protected boolean checkEntity(){
    return true;
}
```

`OperationCommandSupport` adds a lot of help. Common definition of this subclasses overrides `prepare` and `doExecute` methods. Operations are intended to be “free of view stuff” so keep them clean.

```

public class MyOperOperation extends OperationCommandSupport {

    public MyOperOperation(String operationId) {
        super(operationId);
    }

    @Override
    protected boolean prepare(PMContext ctx) throws PMException {
        super.prepare(ctx); // DO NOT FORGET THIS LINE
        if (!finished(ctx)) {
            // init some stuff
            return false;
        } else {
            // do some preprocessing
            return true;
        }
    }

    @Override
    protected void doExecute(PMContext ctx) throws PMException {
        super.doExecute(ctx); // DO NOT FORGET THIS LINE
        // do some good stuff here
    }
}

```

3.5.5.3 Define JSP page

It is not always necessary, some action just “do something” without showing anything but, in the case you need to show a result, you will need to define a JSP page. This must be defined in the following folder:

```
modules/project_ui/webapps/pm/pages/myoper.jsp
```

You can take any of the pm_struts pages as an example. You can also define your own custom tags in:

```
modules/project_ui/webapps/pm/WEB-INF/tags
```

You have also all the struts, JSTL tags and some useful stuff by using:

```

<%@include file="../../inc/inc-full.jsp" %>
<pm:page title="titles.add">
...
</pm:page>

```

Expression Language (EL) is also available, so you can use things like `${entity}` `${field}` `${operation}` in your JSP.

3.5.5.4 Icon & Style

To add an icon associated to your action you must add a 16x16 transparent gif into the following folder:

```
modules/project_ui/webapps/pm/templates/mytemplate/img/myoper.gif
```

After that, you need to add in the buttons.css the following lines:


```
modules/project_ui/webapps/pm/templates/mytemplate/buttons.css
```

```
.myoper {  
    background:url(img/myoper.gif) no-repeat 10px 8px;  
}
```

3.5.5.5 *Naming and internationalization*

Finally, you need to add a name to your operation. You can do this by adding the following line in your application resource file:

```
operation.myoper=Oper name
```

3.6 Fields

Fields are the representation of each instance variable of the represented class that you are going to visualize in each operation.

```
<entity id="..." clazz="...">
  <field id="xx" property="xx" display="xx" align="xx" width="xx">
    <converters>
      ...
    </converters>
    <validators>
      ...
    </validators>
  </field>
  ...
</entity>
```

id	Unique id for this field in this entity
property	Optional, the dot represented name of the property that must have a getter and setter in the represented class. This could be something like “description” or “address.number”. If not defined, id is taken for this purpose.
display	Optional, a white separated list of operation ids where this field will be shown. “all” is the default.
align	Optional, left (default) center right
width	Optional, mainly used by list operation, this is the width of the column for this field.

The name of the field is determined by the following line in the application resource file:

```
pm.field.entityid.fieldid=Some name
```

3.6.1 Converters

The converters for a field are the way it is visually shown in the site and also the way the visual representation is translated to a Java object. Each field may have more than one converter for several operations. General definition is:

```
<field id="xx" ...>
  <converters>
    <converter class="xxx" operations="xxx">
      <properties>
        <property name="xxx" value="xxx" />
        ...
      </properties>
    </converter>
  </converters>
</field>
```

class	Class of the converter
operations	A white separated list of operation ids where this converter will be used for this field.
properties	A group of specific properties for this converter.

All the converters have this default properties:

pad-count	If padding is applied, this is the number of characters to fill
pad-char	If padding is applied, this is the character used to fill the text
pad-direction	If padding is applied, this is the direction of the pad. Could be left or right
prefix	A text shown before the result text
suffix	A text shown after the result text

3.6.1.1 Simple converters

Some of the most common converters are the following

```
<converter class="org.jpos.ee.pm.struts.converter.EditStringConverter">
  <properties>
    <property name="max-length" value="xx" />
  </properties>
</converter>

<converter class="org.jpos.ee.pm.struts.converter.ShowBooleanConverter" />

<converter class="org.jpos.ee.pm.struts.converter.EditBooleanConverter">
  <properties>
    <property name="with-null" value="true | false (default)" />
  </properties>
</converter>

<converter class="org.jpos.ee.pm.struts.converter.EditLongConverter" />

<converter class="org.jpos.ee.pm.struts.converter.EditIntegerConverter" />

<converter class="org.jpos.ee.pm.converter.ShowDateConverter">
  <properties>
    <property name="format" value="dd/MM/yyyy HH:mm:ss" />
  </properties>
</converter>

<converter class="org....converter.ShowISODumpConverter" />

<converter class="org....converter.ShowLocalizedStringConverter"/>

<converter class="org....converter.EditPasswordConverter"/>
```

3.6.1.2 Advanced converters

There are more advanced converters to manipulate collections, objects and weak entities.

```
<converter class="org.jpos.ee.pm.struts.converter.EditCompositionConverter">
<!-- This is for editing weak entities. Just take a look :) -->
  <properties>
    <property name="weak-entity" value="xx" />
  </properties>
</converter>

<converter class="org.jpos.ee.pm.struts.converter.ShowCompositionConverter">
<!-- display a table with the instances of the other entity, those fields displayed
on 'list' operation -->
  <properties>
    <property name="weak-entity" value="xx" />
  </properties>
</converter>

<converter class="org...converter.EditSingleAggregationConverter">
<!-- display a combo with the instances of the other entity-->
  <properties>
    <property name="entity" value="xxx" />
    <property name="with-null" value="xxx" />
  </properties>
</converter>
```

3.6.1.3 Generic converters

Generic converter is a converter defined by a bash based xml usually located at cfg/converters/. It is used as every converter but the property “filename” must be defined.

```
<converter class="org.jpos.ee.pm.converter.GenericConverter">
<properties>
  <property name="filename" value="cfg/converters/show.tostring.converter" />
</properties>
</converter>
```

```
<converter class="org.jpos.ee.pm.converter.GenericConverter">
<properties>
  <property name="filename" value="cfg/converters/show.decimal.converter" />
  <property name="prefix" value="$ " />
  <property name="suffix" value=" .-" />
  <property name="format" value="0" />
</properties>
</converter>
```

3.6.1.4 Custom converters

There are 2 ways to define a new converter. One is through a class extending Converter and define this 2 methods:

```
public String visualize(PMContext ctx) throws ConverterException;
public Object build(PMContext ctx) throws ConverterException;
```

Visualize in pm_struts usually returns a JSP page name, which must be created in the following folder.

Build must take a “string” representation of the object and turn it into the final object. For example, Integer Converter turns a “5” into the integer representation, 5.

```
modules/project_ui/webapps/pm/converters
```

Usually, “ShowSomethingConverter” does not need to build nothing so you can just throw an IgnoreConversionExteption().

Both methods has the following entries in context and helpers inherited by Converter:

Field	ctx.get(PM_FIELD);
Field Value	ctx.get(PM_FIELD_VALUE);
Instance Wrapper	ctx.getSelected();
Entity	ctx.getEntity();
Operation	ctx.getOperation();
Getter for properties	public String getConfig (String name, String def) ;
Getter for value	protected Object getValue(Object einstance, Field field);
Add generic properties	public String visualize(Object obj, String extra);

The other way is to create a generic converter file, which has the following definition:

```
<?xml version="1.0" encoding="UTF-8"?>
<generic-converter>
  <visualize>
    return value.toString();
  </visualize>
  <build>
    throw new IgnoreConversionException("");
  </build>
</generic-converter>
```

Both visualize and build are the same than a normal converter taking in mind that:

- Content is a [Bean Shell](#) script
- You have a “**value**” variable with the value of the field that you are converting. Its an Object.
- You have a “**converter**” variable to access all the properties and helper methods of the Converter class.
- Both definition must return the same value as a normal converter method.

This way is pretty useful to introduce new converters in a production server without compile or restarting the server.

3.6.1.5 External Converters

External converters is a meta definition of converters in a separated xml file. There are 3 goals for this functionality.

1. Is a way to reuse complex converters definition.
2. Is a simplify and modularize entities definitions.
3. Is a way to easy migrate from one visualization engine to another (for example, from Struts to Vaadin) without touching entities.

The definition consists of several steps.

First, the definition of one or more external converter files. An arbitrary number of files may be defined but ids must be globally unique. Converter definition is the same as in entity files.

cfg/xxx.external.conveters.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<external-converters>
  <external-converter id="edit-50-string">
    <converter class="...SomeEditStringConverter" operations="add edit">
      <properties>
        <property name="max-length" value="50" />
      </properties>
    </converter>
  </external-converter>

  <external-converter id="edit-string">
    <converter class="...SomeEditStringConverter" operations="add edit"/>
  </external-converter>

  ...
</external-converters>
```

Second, definition file must be added as a property inside PM bean.

80_pm.xml

```
<property name="external-converters" value="cfg/xxx.external.conveters.xml" />
```

Finally, to link external converters to entities, converter definition in entities file must be replaced with its associated econverter .

For example, we can change this

```
...
<field id="description">
  <converters>
    <converter class="...SomeEditStringConverter" operations="add edit">
      <properties>
        <property name="max-length" value="50" />
      </properties>
    </converter>
  </converters>
</field>
...
```

for this

```
...
<field id="description">
  <converters>
    <econverter id="edit-50-string"/>
  </converters>
</field>
...
```

3.6.2 Validators

Validators are classes that check for unwanted situations, like invalid characters, out of range values and so on. A validator can be defined at field level or at operation level. Actually, a validator at field level will apply in all operations.

```
<field id="xx" ...>
<!-- <operation id="xx"> -->
  <validator class="org.jpos.ee.pm.validator.XxValidator">
    <properties>
      <property name="xxx" value="xxx" />
    </properties>
  </validator>
</field>
<!-- </operation> -->
```

A field may have more than one validator and each validator may have its own properties. Usually, each validator has a “msg” property that is a key of the resource file to show in an error box when the abnormal situation occurs.

3.6.2.1 Predefined validators

All of the following classes are in **org.jpos.ee.pm.validator** package

IsNameValidator	Validate the pattern “name”
LengthValidator	Uses the properties “max-length”, “max-length-msg”, “min-length” and “min-length-msg” to validate a string length.
NotNull	Check if the object is not null

3.6.2.2 Custom Validators

To create a custom validator you just need to implement `org.jpos.ee.pm.validator.Validator` interface but a better way is to inherit from `org.jpos.ee.pm.validator.ValidatorSupport` which allow the use of properties.

The validation method that must be implemented is

```
public ValidationResult validate(PMContext ctx);
```

Context content is the same in converters. `ValidationResult` is a class with 2 variables

boolean successful	True when validation was ok
List<PMMessage> messages	List of errors to be shown

A `PMMessage` has the following content:

key	Property for <code>ActionErrors.add()</code> method
message	Message from application resource file
Arg0, arg1, arg2, arg3	Arguments for the message

Each `PMMessage` will be placed as a struts error message.

3.7 Security

Security is, at the moment, implemented in a simple way based on eecore3 user management. Basically, it has the same “core + implementation” concept than Presentation Manager. Implementing an interface you can define your own security or use the basic, database based security or not use at all.

Basic PM security uses a powerful Bcrypt algorithm.

The DB based implementation is at pm_core_db and also there is a PM based module that provides a basic but useful set of entities to directly include in your PM bean (80_pm.xml) at pm_security_ui.

To make use of this modules, you must create the following file in your module_ui/deploy folder:

```
79_security.xml
<security-manager class="org.jpos.ee.pm.security.core.PMSecurityService"
logger="Q2">
  <property name="connector"
value="org.jpos.ee.pm.security.db.PMSecurityDBConnector" />
</security-manager>
```

The connector define the main interface to implement a security instance module.

After including security bean, you must activate login in presentation manager bean:

```
80_pm.xml
<property name="login-required" value="true" />
<property name="ignore-db" value="false" />
```

If you want to use the pm_security_ui entities you may also include the following lines to PM bean.

```
<!-- Security Entities -->
<property name="entity" value="cfg/entities/secuser.xml" />
<property name="entity" value="cfg/entities/secusergroup.xml" />
<property name="entity" value="cfg/entities/secperm.xml" />
<property name="entity" value="cfg/entities/secuserprofile.xml" />
```

security.sql contains the mysql script to create security tables with a default user “admin” with “test” password.

You must add this to your hibernate configuration file.

```
<mapping class="org.jpos.ee.pm.security.SECPermission" />
<mapping class="org.jpos.ee.pm.security.SECUserGroup" />
<mapping class="org.jpos.ee.pm.security.SECUser" />
<mapping class="org.jpos.ee.pm.security.SECUserProp" />
```

Result will be a login screen at startup and “profile” link when logged as a user. With security activated, now you can make use of the “perm” attribute of a menu item to show / hide items depending of defined permissions of each user.

3.8 Monitors

3.8.1 Introduction

Monitors are still under extension but main idea is to “watch something over time”, like a DB table or a file. Basic definition, similar to entities is an xml with a line attached to PM bean:

```
80_pm.xml
...
<property name="monitor" value="cfg/monitors/q2.xml" />
...
```

A monitor definition is something like

```
<?xml version='1.0' ?>
<!DOCTYPE entity SYSTEM "cfg/monitor.dtd">
<monitor>
  <id>monitorId</id>
  <source class="org.jpos.ee.pm.core.monitor.XxMonitorSource" >
    <properties>
      <property name="xx" value="yy" />
    </properties>
  </source>
  <formatter class="org.jpos.ee.pm.core.monitor.XxFormatter" >
    <properties>
      <property name="xx" value="yy" />
    </properties>
  </formatter>
  <delay>xx</delay>
  <max>xx</max>
  <cleanup>true | false</cleanup>
  <all>true | false</all>
</monitor>
```

id	Id of the monitor (used on menu or anywhere it need to be referenced)
source	Source is class extending abstract class MonitorSource and represents the “where monitor takes information”
formatter	Formatter is a class extending MonitorFormatter (or even MonitorFormatter class) that get a MonitorLine generated by source and turn it into a string.
delay	Delay between each refresh (in ms)
max	Maximun number of visible lines.
Cleanup	False by default, If true, each refresh of the monitor clean ups the list.
All	False by default. If true, each refresh of the monitor shows all the information given by the source

3.8.2 Existing sources

There are two predefined monitor source implementation.

Module	Class	Description
pm_core	org.jpos.ee.pm.core.monitor.FileMonitorSource	A monitor to watch a file. “filename” property is required.
pm_core_db	org.jpos.ee.pm.core.monitor.SQLMonitorSource	A monitor to watch a database query. Three properties are needed: <ul style="list-style-type: none">• query: SQL text to get the monitor information• last-line-query: SQL text to get the monitor last line• id-column: column index which identifies the above query.

3.8.3 Existing formatters

There are two predefined monitor formatters.

Module	Class	Description
pm_core	org.jpos.ee.pm.core.monitor.MonitorFormatter	Simple formatter that receive a plain string and returns it “as is”
pm_core	org.jpos.ee.pm.core.monitor.BasicObjectArrayFormatter	Formatter that receive an array of items and uses two properties to format: <ul style="list-style-type: none">• pads: A string separated by “#” that represents the padding of each array item. See the example on next section for details.• separator: a string that separates each array item.

3.8.4 Examples

Monitor for q2.log file

```
<?xml version='1.0' ?>
<!DOCTYPE entity SYSTEM "cfg/monitor.dtd">
<monitor>
  <id>q2</id>
  <source class="org.jpos.ee.pm.core.monitor.FileMonitorSource" >
    <properties>
      <property name="filename" value="log/q2.log" />
    </properties>
  </source>
  <formatter class="org.jpos.ee.pm.core.monitor.MonitorFormatter" />
  <delay>3000</delay>
  <max>100</max>
</monitor>
```

Q2 LOG MONITOR (MONITOR)

```
Thread[btpool0-0,5,main]
Thread[btpool0-1 - Acceptor0 SelectChannelConnector@0.0.0.0:8080,5,main]
Thread[btpool0-2 - Acceptor1 SelectChannelConnector@0.0.0.0:8080,5,main]
Thread[btpool0-3 - Acceptor0 SslSocketConnector@0.0.0.0:8040,5,main]
Thread[btpool0-4,5,main]
Thread[btpool0-5,5,main]
Thread[btpool0-6,5,main]
Thread[btpool0-7,5,main]
Thread[btpool0-8,5,main]
Thread[btpool0-9,5,main]
Thread[Timer-2,5,main]
Thread[Timer-3,5,main]
Thread[Timer-4,5,main]
Thread[Timer-5,5,main]
Thread[Timer-6,5,main]
Thread[Timer-396,5,main]
Thread[SystemMonitor,5,main]
</threads>
--- name-registrar ---
logger.Q2: org.jpos.util.Logger
presentation-manager: org.jpos.ee.pm.struts.PMStrutsService
logger.pm-logger: org.jpos.util.Logger
</info>
</log>
```

Monitor file for “status” table of jPOS **status** module.

```
<?xml version='1.0' ?>
<!DOCTYPE entity SYSTEM "cfg/monitor.dtd">
<monitor>
  <id>status</id>
  <source class="org.jpos.ee.pm.core.monitor.SQLMonitorSource" >
    <properties>
      <property name="query" value="SELECT id, name, state, detail, lastTick,
timeout, timeoutState FROM status" />
      <property name="last-line-query" value="SELECT id, name, state, detail,
lastTick, timeout, timeoutState FROM status" />
      <property name="id-column" value="0" />
    </properties>
  </source>
  <formatter class="org.jpos.ee.pm.core.monitor.BasicObjectArrayFormatter">
    <properties>
      <property name="pads" value="[0,R, ,20] # [1,R, ,40] # [2,R, ,2] #
[3,R, ,75]"/>
      <property name="separator" value=" | " />
    </properties>
  </formatter>
  <delay>3000</delay>
  <max>100</max>
  <cleanup>true</cleanup>
  <all>true</all>
</monitor>
```

pads formats contains 4 parts, “[0, R, , 20]”

1. Index of the array
2. R or L: right or left padding
3. Padding character
4. Padding length

heartbeat	Heartbeat	OK	memory=172490752, threads=45, uptime=5m0s, tick=2
host-echo	Echo Test	OK	tick=2, demora=102 seg
internet	Internet Access	OK	time=121ms