

Integrating Struts Menu with SAP UME for Role Based Navigation



Applies to:

SAP NW Web AS Java 700

Summary

Outlines a solution to integrate the open source struts menu with SAP UME in order to build role based navigation for struts based web application

Authors : Vedula Bhaskar Rao

Company : SAP Labs India

Created on : 27 December 2008

Author's Bio



Bhaskar joined SAP Labs India as a student intern from IIT, Bangalore and has worked on various topics like NW Landscape setup, CTC development and Web Dynpro development. Currently he is a part of the LPO development team at Labs India.

Table of Contents

Introduction	3
Problem Statement	3
Solution	4
Example Scenario	6
Summary	9
LoginAction.java	10
SDNPermissionAdapter.java	12
SDNPermission	13
menu-config.xml	13
actions.xml	17
Related Content	20
Copyright	21

Introduction

Apache struts is an open source web application framework for developing Java EE web applications. It uses and extends the Java Servlet API to encourage developers to adopt the model-view-controller architecture (MVC). This article assumes that you have a rough idea of the SAP UME, struts framework and fair bit knowledge of JSP and tag libraries. Rather than a technology deep dive into struts, struts-menu or SAP UME technology the article outlines a ready to run solution where in a struts based web application we use the struts menu to build a navigation structure based on the UME roles for a user.

Problem Statement

We need to build a navigation structure for an application for a large corporation which has three departments which are Engineering, Finance and HR. The navigation structure should be build upon the roles which are assigned to the employees. Like Finance manager shall only see the Finance tab and the related menus. There should also be a provision in which the end user can build custom roles by which he can define custom navigation.

Below is the complete navigation structure the user can see.

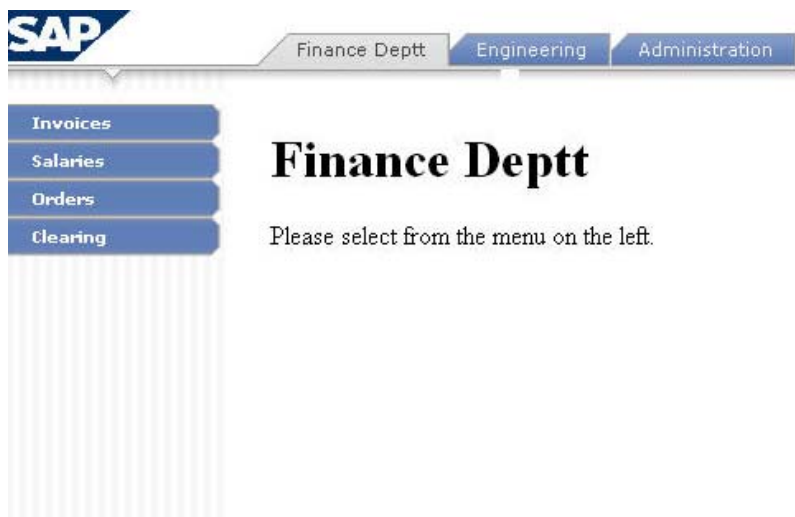


Figure 1

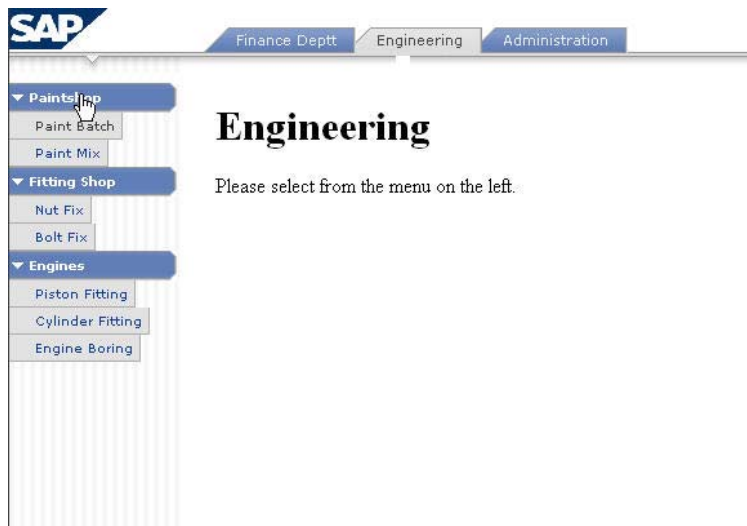


Figure 2

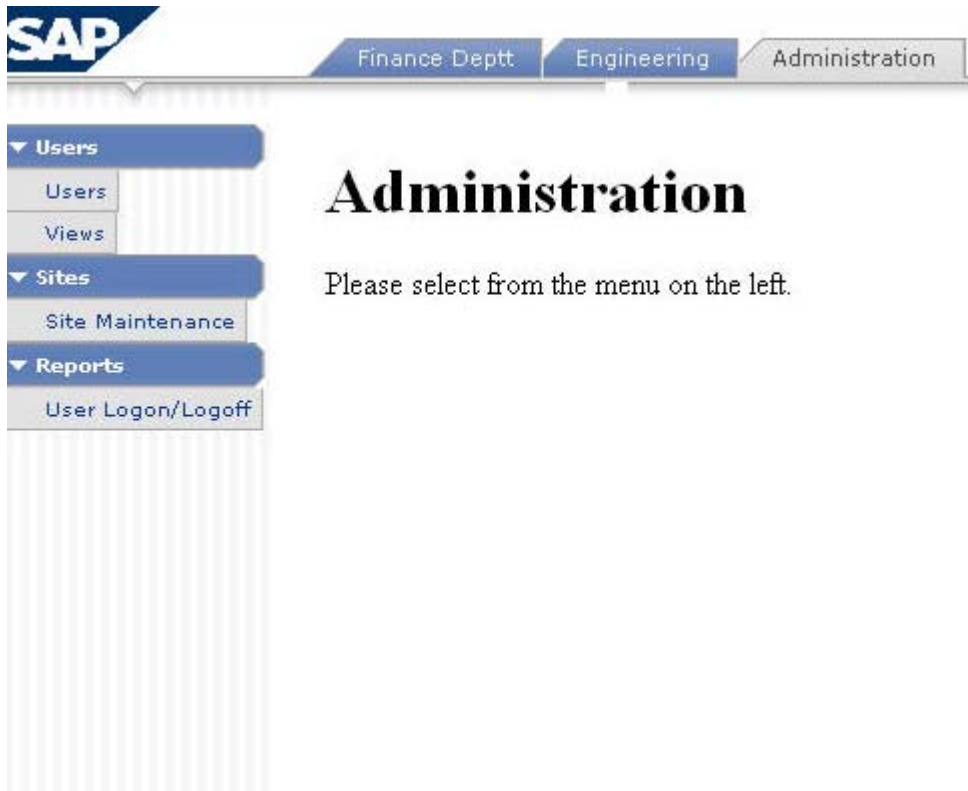


Figure 3

Solution

The application is a struts application and has the controller called the LoginAction. The login action class extends the struts Action servlet and performs the following function:

1. It contains the SAP UME authentication code which checks whether the user is authenticated on the server. This is done like this :


```

IUser umeUser =
UMFactory.getLogonAuthenticator().getLoggedInUser(request, response);
    if(umeUser==null)
    {
        umeUser =
UMFactory.getLogonAuthenticator().forceLoggedInUser(request, response);
    }

```
2. Contains the code which builds and renders the navigation structure.

Since this article's main intention is to highlight the integration between struts menu and UME we would skip the details about how to set up the struts application and the struts menu technology as whole lot of documentation is available and the article comes with the full source code of the application, hence is self explanatory.

The struts-menu has an interface called PermissionAdapter, this has a method called isAllowed, that is called at runtime for each menu and menu item when the menu is being drawn. If it returns true, the item is drawn, if it returns false, the item is not drawn. The menu and associated menu item of the menu is declared in the menu-config.xml .

For more details on struts-menu refer to <http://struts-menu.sourceforge.net/security.html>

The menu-config.xml for this application looks like [this](#)

UME Permission is basically a software class that is programmed to provide various checks on declarative UME Actions. UME Actions are declarative in nature. Actions are declared and assigned to a permissions class using the [actions.xml](#) file.

We create the SDNPermission class which extends the ActionPermission and which checks the authorizations for our application. For more details please refer to:

http://help.sap.com/saphelp_nw04s/helpdata/en/a4/d39b3e09cdf313e10000000a114084/frameset.htm

The UME users can be assigned to roles which contain the actions and hence the permissions assigned to the actions. For more detail please refer

http://help.sap.com/saphelp_nw70/helpdata/en/a4/d39b3e09cdf313e10000000a114084/frameset.htm

The relationship between roles, permission and actions is illustrated below.

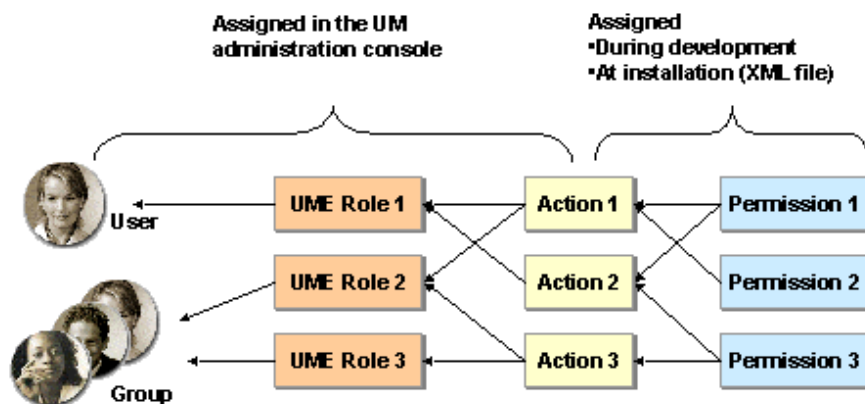


Figure 4 Role-Action-Permission relation

The class [SDNPermissionAdapter](#) implements the PermissionAdapter interface and the *isAllowed()* method checks if the user has permission for the given menu item.

The UME actions deployed for this application, via the [actions.xml](#), in the UME have the same names (1:1 mapping) as the menu items names declared in the menu-config.xml. These actions reference the permission class which is instantiated at runtime for the given action to generate permission objects. The permission then determines the menu items (hence the navigation structure) and so the associated pages that the user has access to.

So for every **leaf level** menu item in the [menu-config.xml](#) eg “mysite” we have a corresponding UME action “sdn_mysite” which can be assigned to a role. Based on the actions in the role the navigation structure is built for the user.

Example Scenario

Let's consider that a user can see the following perform operations:

Finance → Process Invoices and Process Orders

Engineering → Paint Mixing, Bolt fixing and Engine boring

Administration → None

So we create a role called TestRole1 and assign it the following actions

sdn_invoices, sdn_orders, sdn_paintmix, sdn_boltfix and sdn_boring

The screenshot displays the SAP UME interface for role configuration. The top navigation bar includes 'Welcome Administrator', 'Identity Management', 'Batch Import', 'User Management Configuration', and 'User Management Consistency Check'. The 'Search' section is active, showing search criteria and a table with columns for Type, Name, Description, and Data Source. Below this, the 'Details' section is open, showing tabs for 'General Information', 'Assigned Groups', 'Assigned Users', 'Assigned Actions', and 'User Mapping for System Access'. The 'Assigned Actions' tab is selected, displaying two tables: 'Available Actions' and 'Assigned Actions'.

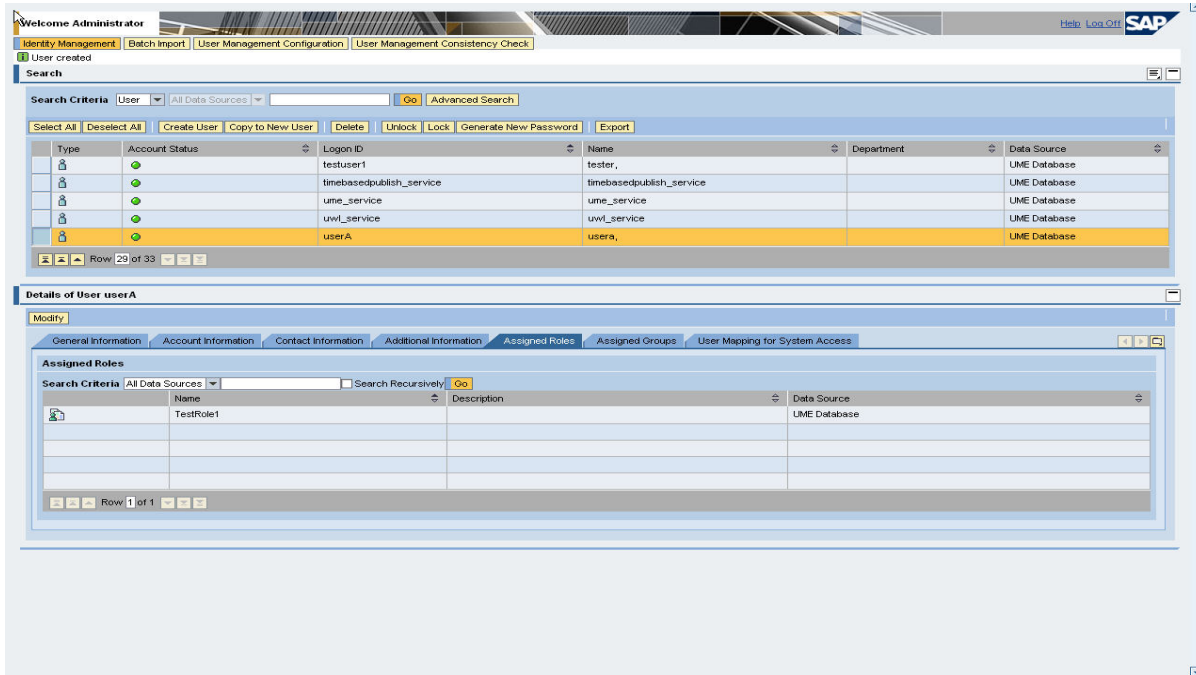
Available Actions Table:

Type	Service / Application	Name
UME	SDNAppActions	sdn_piston
UME	SDNAppActions	sdn_nutfix
UME	SDNAppActions	sdn_boring
UME	SDNAppActions	sdn_invoices
UME	SDNAppActions	sdn_cylinder

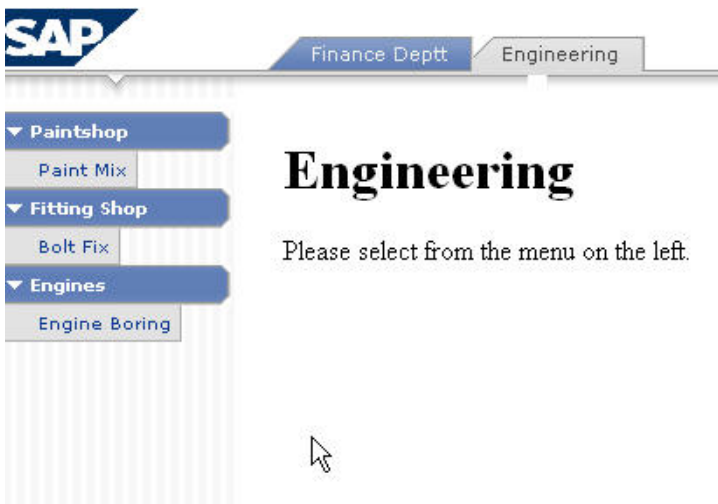
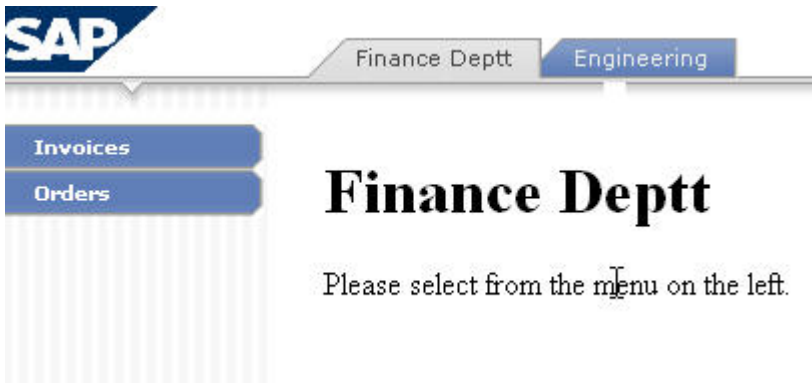
Assigned Actions Table:

Type	Service / Application	Name
UME	SDNAppActions	sdn_paintmix
UME	SDNAppActions	sdn_orders
UME	SDNAppActions	sdn_boltfix
UME	SDNAppActions	sdn_boring
UME	SDNAppActions	sdn_invoices

Let's assign this to a user say userA



When we logon to the application `http://<server>:<port>/SdnStrutMenuApp/menu/login.do` with the user userA we get the following navigation structure.



Now lets create a role Test_Role_All and we assign all the actions with the prefix sdn*

The screenshot shows the SAP UME interface. At the top, there's a search bar with 'Test_Role_All' entered. Below it, a table lists the role details:

Type	Name	Description	Data Source
	Test_Role_All	Test_Role_All	UME Database

Below the table is the 'Details of Role Test_Role_All' section. It has tabs for 'General Information', 'Assigned Groups', 'Assigned Users', 'Assigned Actions', and 'User Mapping for System Access'. The 'Assigned Actions' tab is active, showing two tables:

Available Actions

Type	Service / Application	Name
UME	SDNAppActions	sdn_views
UME	SDNAppActions	sdn_prefix
UME	SDNAppActions	sdn_orders
UME	SDNAppActions	sdn_clearing
UME	SDNAppActions	sdn_halfix

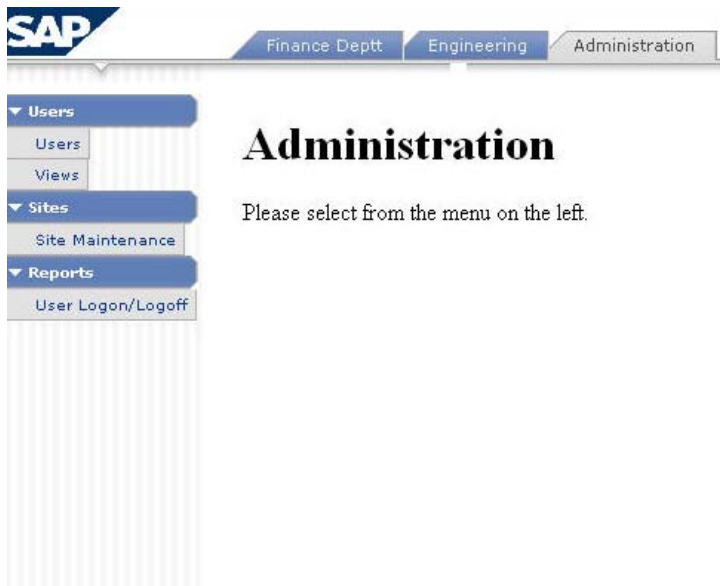
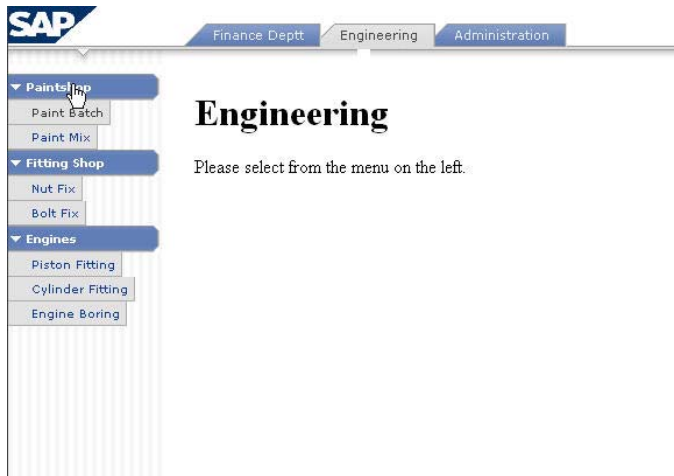
Assigned Actions

This table is currently empty, with a prompt: 'Enter a search parameter and choose Go.'

Assign it to a user say userB and logon to the application <http://<server>:<port>/SdnStrutMenuApp/logon.do>

The following navigation structure results

The screenshot shows the SAP application navigation structure. At the top, there's a navigation bar with 'Finance Deptt', 'Engineering', and 'Administration'. Below it, there's a sidebar menu with 'Invoices', 'Salaries', 'Orders', and 'Clearing'. The main content area displays 'Finance Deptt' in a large font, followed by the text 'Please select from the menu on the left.'



Summary

This article demonstrates how you can use struts menu to build UME role based navigation in a struts based web application.

To play around please deploy the following two enterprise archives. The `sap.com~sdnperms.ear` contains the UME actions and `SdnStrutMenuAppEar` is the application.

To run the application please enter the following url `http://<server>:<port>/SdnStrutMenuApp/menu/Main.jsp`



`sap.com~sdnperms.ear`



`SdnStrutMenuAppEar.ear`

For source code and further information please feel free to contact me.

LoginAction.java

```

public class LoginAction extends Action
{

    /* (non-Javadoc)
     * @see
    org.apache.struts.action.Action#execute(org.apache.struts.action.ActionMapping,
    org.apache.struts.action.ActionForm, javax.servlet.http.HttpServletRequest,
    javax.servlet.http.HttpServletResponse)
     */
    public ActionForward execute(
        ActionMapping mapping,
        ActionForm form,
        HttpServletRequest request,
        HttpServletResponse response)
        throws Exception {
        // TODO Auto-generated method stub
        final String GO = "success";
        final String END = "failure";

        JspFactory jspFactory = JspFactory.getDefaultFactory();
        PageContext pageContext = jspFactory.getPageContext(this.getServlet(),
        request, response, null, true, 8192, true);

        IUser umeUser =
        UMFactory.getLogonAuthenticator().getLoggedInUser(request, response);
        if(umeUser==null)
        {
            umeUser =
            UMFactory.getLogonAuthenticator().forceLoggedInUser(request, response);
        }
        /**
         * The real juice
         */
        MenuRepository menuRepository = new MenuRepository();
        menuRepository.setServletContext(this.getServlet().getServletContext());
        menuRepository.setLoadParam("/WEB-INF/menu-config.xml");
        menuRepository.load();

        // Save the repository in the session so the displayer can modify it per
        user
        // (it does that...)
        request.getSession().setAttribute(MenuRepository.MENU_REPOSITORY_KEY,
        menuRepository);
        SDNPermissionAdapter permissions = new SDNPermissionAdapter(umeUser);
        request.getSession().setAttribute("sdnLogicAdapter", permissions);

        //Create velocity displayer
        MenuDisplayerMapping menuDisplayerMapping =
        menuRepository.getMenuDisplayerMapping("Velocity");
        VelocityMenuDisplayer velocityMenuDisplayer = new VelocityMenuDisplayer();
        velocityMenuDisplayer.setPermissionsAdapter(permissions);

```

```

velocityMenuDisplayer.init(pageContext, menuDisplayerMapping);

    Iterator topMenuIter ;
    // Loop through all submenu's so I can remove menu items that a user
doesn't have
    // (because struts-menu doesn't call "isAllowed" for menu items that belong
to a menu item...)
    topMenuIter = menuRepository.getTopMenus().iterator();
    while (topMenuIter.hasNext())
    {
        MenuComponent tempMenuComponent = (MenuComponent)topMenuIter.next();
        Iterator menuIter = tempMenuComponent.getComponents().iterator();
        while (menuIter.hasNext())
        {
            MenuComponent menu = (MenuComponent)menuIter.next();
            // menu.setWidth(StrutsUtils.getLocalizedName(local,
WebPresentationConstants.applicationResourceBundle, menu.getWidth()));
            menu.setWidth(menu.getWidth());

            // update menu components with only allowed components
            List componentsAllowed = new ArrayList();
            MenuComponent[] components = menu getMenuComponents();
            for (int i = 0; i < components.length; i++) {
                if (velocityMenuDisplayer.isAllowed(components[i])) {

components[i].setWidth(getWidth(components[i].getWidth()));
                                componentsAllowed.add(components[i]);
                }
            }
            menu.getComponents().clear();
            menu.getComponents().addAll(componentsAllowed);
        }
    } //end of while

    return mapping.findForward(GO);
}

private String getWidth(String key)
{
    MessageResources msgRsrc =
MessageResources.getMessageResources("com.sap.sdn.demo.ApplicationResources");
    return msgRsrc.getMessage(key);
}
}

```

SDNPermissionAdapter.java

```

public class SDNPermissionAdapter implements PermissionsAdapter
{
    private IUser umeUser = null;
    private final String PERM_VALUE_FULL = "*";

    /**
     * Construtor
     */
    public SDNPermissionAdapter(IUser loggedUser)
    {
        this.umeUser = loggedUser ;
    }

    /** (non-Javadoc)
     * @see
     net.sf.navigator.menu.PermissionsAdapter#isAllowed(net.sf.navigator.menu.MenuComponent)
     */
    public boolean isAllowed(MenuComponent menu)
    {
        boolean retVal = false ;

        if(menu==null)
        {
            return retVal ;
        }

        if ((menu.getMenuComponents() != null) && (menu.getMenuComponents().length
> 0))
        {
            for (int i = 0; i < menu.getMenuComponents().length; i++)
            {
                if (isAllowed(menu.getMenuComponents()[i]))
                {
                    return true;
                }
            }
        }
        else if (menu.getName() != null)
        {
            String name = menu.getName();
            /**
             * evaluation of menu based on ume action since
             * we have 1:1 correspondence
             */
            retVal = this.umeUser.hasPermission(new
SDNPermission(name,PERM_VALUE_FULL));

            return retVal;
        }
    }
}

```

```

        return retVal;
    }
}

```

SDNPermission

```

public class SDNPermission extends ActionPermission {

    /**
     * @param arg0
     * @param arg1
     */
    public SDNPermission(String name, String value)
    {
        super(name, value);
        // TODO Auto-generated constructor stub
    }
}

```

menu-config.xml

```

<?xml version="1.0" encoding="UTF-8" ?>
<MenuConfig>
    <Displayers>
        <Displayer name = "Velocity" type =
"net.sf.navigator.displayer.VelocityMenuDisplayer"/>
    </Displayers>
    <Menus>
        <Menu
            name = "finance"
            title = "menu.sidenav.finance" <!--key of the title in the resource file-->
            page = "/menu/SideNavigationMaterial.jsp" <!--page to be invoked when link
clicked -->
            target = "sidenav">
            <Item
                name = "invoices"
                title = "menu.sidenav.material.invoices"
                page = "/invoices.html"
                target = "workspace"/>

```

```
<Item
    name = "salaries"
    title = "menu.sidenav.material.salaries"
    page = "/salaries.html"
    target = "workspace"/>
    <Item
        name = "orders"
        title = "menu.sidenav.keb.orders"
        page = "/orders.html"
        target = "top"/>
        <Item
            name = "clearing"
            title = "menu.sidenav.keb.clearing"
            page = "/keb/materialJob.do"
            target = "workspace"/>
</Menu>
<Menu
    name = "engineering"
    title = "menu.sidenav.engineering"
    page = "/menu/SideNavigationMaster.jsp"
    target = "sidenav">
    <Item name = "paintshop" title = "menu.sidenav.master.paintshop">
        <Item
            name = "paintbatch"
            title = "menu.sidenav.master.items.paintbatch"
            page = "/paintbatch.html"
            target = "workspace"/>
        <Item
            name = "paintmix"
            title = "menu.sidenav.master.items.paintmix"
            page = "/paintmix.html"
```

```
        target = "workspace"/>
</Item>
<Item name = "fitting" title = "menu.sidenav.master.fitting">
    <Item
        name = "nutfix"
        title = "menu.sidenav.master.workcentersgroups.nutfix"
        page = "/nutfix.html"
        target = "workspace"/>
    <Item
        name = "boltfix"
        title = "menu.sidenav.master.workcentersgroups.boltfix"
        page = "/boltfix.html"
        target = "workspace"/>
</Item>
<Item name = "engines" title = "menu.sidenav.master.engines">
    <Item
        name = "piston"
        title = "menu.sidenav.master.pacemaker.piston"
        page = "/piston.html"
        target = "workspace"/>
    <Item
        name = "cylinder"
        title = "menu.sidenav.master.pacemaker.cylinder"
        page = "/cylinder.html"
        target = "workspace"/>
    <Item
        name = "boring"
        title = "menu.sidenav.master.pacemaker.boring"
        page = "/boring.html"
        target = "workspace"/>
</Item>
```

```
</Menu>

<Menu

  name = "admin"

  title = "menu.sidenav.admin"

  page = "/menu/SideNavigationAdmin.jsp"

  target = "sidenav">

  <Item name = "user" title = "menu.sidenav.admin.user">

    <Item

      name = "users"

      title = "menu.sidenav.admin.user.users"

      page = "/users.html"

      target = "workspace"/>

    <Item

      name = "views"

      title = "menu.sidenav.admin.user.views"

      page = "/views.html"

      target = "workspace"/>

  </Item>

  <Item name = "sites" title = "menu.sidenav.admin.sites">

    <Item

      name = "enterprisedivisionsite"

      title = "menu.sidenav.admin.sites.enterprisedivisionsite"

      page = "/admin/edsSearch.do"

      target = "workspace"/>

    </Item>

  <Item name = "reports" title = "menu.sidenav.reports">

    <Item

      name = "userslogon"

      title = "menu.sidenav.reports.userslogon"

      page = "/security/usersLogon.do"

      target = "workspace"/>
```



```

        </Item>

    </Menu>

</Menus>
</MenuConfig>

```

actions.xml

```

<BUSINESSSERVICE NAME="SDNAppActions">
    <DESCRIPTION LOCALE="en" VALUE="SDN App action-permission" />
    <!-- Detailed Business Service Actions -->
    <!--Finance-->
    <ACTION NAME= "sdn_salaries" >
        <DESCRIPTION LOCALE= "en" VALUE= "View salaries" />
        <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
            NAME= "salaries" VALUE = "*" />
    </ACTION>
    <ACTION NAME= "sdn_invoices" >
        <DESCRIPTION LOCALE= "en" VALUE= "View invoices" />
        <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
            NAME= "invoices" VALUE = "*" />
    </ACTION>
    <ACTION NAME= "sdn_orders" >
        <DESCRIPTION LOCALE= "en" VALUE= "View orders" />
        <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
            NAME= "orders" VALUE = "*" />
    </ACTION>
    <ACTION NAME= "sdn_clearing" >
        <DESCRIPTION LOCALE= "en" VALUE= "View clearing" />
        <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
            NAME= "clearing" VALUE = "*" />
    </ACTION>
    <!-- Engineering -->

```

```
<!--subMenu paintshop -->
<ACTION NAME= "sdn_paintbatch" >
    <DESCRIPTION LOCALE= "en" VALUE= "View paintbatch" />
    <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
        NAME= "paintbatch" VALUE = "*" />
</ACTION>
<ACTION NAME= "sdn_paintmix" >
    <DESCRIPTION LOCALE= "en" VALUE= "View paintmix" />
    <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
        NAME= "paintmix" VALUE = "*" />
</ACTION>
<!--subMenu fitting -->
<ACTION NAME= "sdn_nutfix" >
    <DESCRIPTION LOCALE= "en" VALUE= "View nutfix" />
    <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
        NAME= "nutfix" VALUE = "*" />
</ACTION>
<ACTION NAME= "sdn_boltfix" >
    <DESCRIPTION LOCALE= "en" VALUE= "View boltfix" />
    <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
        NAME= "boltfix" VALUE = "*" />
</ACTION>
<!--subMenu engine-->
<ACTION NAME= "sdn_piston" >
    <DESCRIPTION LOCALE= "en" VALUE= "View piston" />
    <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
        NAME= "piston" VALUE = "*" />
</ACTION>
<ACTION NAME= "sdn_cylinder" >
```

```

<DESCRIPTION LOCALE= "en" VALUE= "View cylinder" />
<PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
  NAME= "cylinder" VALUE = "*" />
</ACTION>
<ACTION NAME= "sdn_boring" >
  <DESCRIPTION LOCALE= "en" VALUE= "View boring" />
  <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
    NAME= "boring" VALUE = "*" />
</ACTION>
  <!--Admin-->
<ACTION NAME= "sdn_users" >
  <DESCRIPTION LOCALE= "en" VALUE= "View users" />
  <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
    NAME= "users" VALUE = "*" />
</ACTION>
<ACTION NAME= "sdn_views" >
  <DESCRIPTION LOCALE= "en" VALUE= "View views" />
  <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
    NAME= "views" VALUE = "*" />
</ACTION>
<ACTION NAME= "sdn_mysite" >
  <DESCRIPTION LOCALE= "en" VALUE= "View enterprisedivisionsite" />
  <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
    NAME= "mysite" VALUE = "*" />
</ACTION>
<ACTION NAME= "sdn_userslogon" >
  <DESCRIPTION LOCALE= "en" VALUE= "View userslogon" />
  <PERMISSION CLASS= "com.sap.sdn.demo.SDNPermission"
    NAME= "userslogon" VALUE = "*" />
</ACTION>
</BUSINESSSERVICE>

```

Related Content

<https://www.sdn.sap.com/irj/scn/weblogs?blog=/pub/wlg/1318>

<https://www.sdn.sap.com/irj/scn/weblogs?blog=/pub/wlg/1377>

http://help.sap.com/saphelp_nw04s/helpdata/en/21/f8424089ff2571e1000000a155106/frameset.htm

For more information, visit the [Java homepage](#).

Copyright

© 2008 SAP AG. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP AG. The information contained herein may be changed without prior notice.

Some software products marketed by SAP AG and its distributors contain proprietary software components of other software vendors.

Microsoft, Windows, Outlook, and PowerPoint are registered trademarks of Microsoft Corporation.

IBM, DB2, DB2 Universal Database, OS/2, Parallel Sysplex, MVS/ESA, AIX, S/390, AS/400, OS/390, OS/400, iSeries, pSeries, xSeries, zSeries, System i, System i5, System p, System p5, System x, System z, System z9, z/OS, AFP, Intelligent Miner, WebSphere, Netfinity, Tivoli, Informix, i5/OS, POWER, POWER5, POWER5+, OpenPower and PowerPC are trademarks or registered trademarks of IBM Corporation.

Adobe, the Adobe logo, Acrobat, PostScript, and Reader are either trademarks or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Oracle is a registered trademark of Oracle Corporation.

UNIX, X/Open, OSF/1, and Motif are registered trademarks of the Open Group.

Citrix, ICA, Program Neighborhood, MetaFrame, WinFrame, VideoFrame, and MultiWin are trademarks or registered trademarks of Citrix Systems, Inc.

HTML, XML, XHTML and W3C are trademarks or registered trademarks of W3C®, World Wide Web Consortium, Massachusetts Institute of Technology.

Java is a registered trademark of Sun Microsystems, Inc.

JavaScript is a registered trademark of Sun Microsystems, Inc., used under license for technology invented and implemented by Netscape.

MaxDB is a trademark of MySQL AB, Sweden.

SAP, R/3, mySAP, mySAP.com, xApps, xApp, SAP NetWeaver, and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP AG in Germany and in several other countries all over the world. All other product and service names mentioned are the trademarks of their respective companies. Data contained in this document serves informational purposes only. National product specifications may vary.

These materials are subject to change without notice. These materials are provided by SAP AG and its affiliated companies ("SAP Group") for informational purposes only, without representation or warranty of any kind, and SAP Group shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP Group products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

These materials are provided "as is" without a warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement.

SAP shall not be liable for damages of any kind including without limitation direct, special, indirect, or consequential damages that may result from the use of these materials.

SAP does not warrant the accuracy or completeness of the information, text, graphics, links or other items contained within these materials. SAP has no control over the information that you may access through the use of hot links contained in these materials and does not endorse your use of third party web pages nor provide any warranty whatsoever relating to third party web pages.

Any software coding and/or code lines/strings ("Code") included in this documentation are only examples and are not intended to be used in a productive system environment. The Code is only intended better explain and visualize the syntax and phrasing rules of certain coding. SAP does not warrant the correctness and completeness of the Code given herein, and SAP shall not be liable for errors or damages caused by the usage of the Code, except if such damages were caused by SAP intentionally or grossly negligent.