

Developer Guide

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eXo Platform

Table of Contents

About this guide	v
1. Get Started	1
1.1. Glossary	1
1.2. Set up Maven settings	4
1.3. eXo Architecture Primer	6
1.3.1. Kernel	6
1.3.2. GateIn extensions	10
1.3.3. Java Content Repository	13
2. Create Your Own Portal	17
2.1. Create your extension project	17
2.2. Define a default portal	18
2.3. Structure of portal, pages and menus	19
2.3.1. Portal navigation	19
2.3.2. Visibility of pages	22
2.3.3. Page access permission	22
2.4. Enable/Disable a drive creation during the portal creation	23
2.5. Add/Remove a language	24
2.5.1. Add a new language	24
2.5.2. Remove a language	25
2.6. Create a custom look and feel	26
2.6.1. Platform skin elements	26
2.6.2. Override skins with extension	29
2.6.3. Create new skins	30
2.6.4. Skin the portlet	34
2.6.5. Configure Platform skin	35
2.6.6. Configure skin in WCM	41
2.6.7. Customize Document's skin	43
2.6.8. Best practices to customize a skin	46
2.7. Add JavaScript to your portal	47
2.8. Create custom templates for pages	48
3. Work With Content	53
3.1. Node type	53
3.2. WCM template	54
3.3. Document type	54
3.4. Dialog Syntax	54
3.4.1. Interceptors	54
3.4.2. Hidden fields	55
3.5. Customize CKEditor	61
3.5.1. Installation	61
3.5.2. File and Folder Structure	61
3.5.3. Configuration in CKEditor	63
3.6. Taxonomy	66
3.7. Manage Template service	66
3.8. Manage Navigation By Content	68
3.8.1. Actual content navigation	68
3.8.2. Add content to the navigation	71
3.8.3. Actions on Navigation By Content	73
3.8.4. Examples of creating data for Navigation By Content	76
4. Work With Applications	85
4.1. Integrate an application	85

4.2. Develop your own application	86
4.2.1. Gadget vs Portlet	86
4.2.2. Develop a gadget for eXo Platform	86
4.2.3. Portlet Bridges	90
5. System Integration	91
5.1. Authentication	91
5.1.1. Single-Sign-On (SSO)	91
5.1.2. Central Authentication Service (CAS)	91
5.1.3. Kerberos SSO on Active Directory	91
5.2. Users integration	92
5.2.1. Organization Service	92
5.2.2. Memberships, Groups and Users	92
5.2.3. Organization API	94
5.3. LDAP Integration	94
5.3.1. Connection Settings	94
5.3.2. Organization Service Configuration	95
5.3.3. Active Directory sample configuration	101
5.3.4. Picketlink IDM	102
5.4. Email	103
6. eXo Platform 3.5 APIs	105
6.1. Definitions of API Levels	105
6.2. Platform APIs	106
6.2.1. Java APIs	106
6.2.2. JavaScript APIs	107
6.2.3. Web Services	107
6.3. Provisional APIs	107
7. Cookbook	109
7.1. How to Copy a Site	109
8. Upgrade eXo Platform	119
8.1. Prerequisites	119
8.2. Prepare your extension project	119
8.3. What needs to be adapted in eXo Platform extension	120
8.4. Update project Maven dependencies	120
8.5. Update configurations	121
8.6. Update components	122
8.7. Update extension	122
8.7.1. Update Kernel XML Schema	122
8.7.2. Update portal	123
8.7.3. Update APIs	124

About this guide

The intended readers of this document are users using eXo Platform. This user guide explains all the basic and advanced features of eXo Platform by providing a series of in-depth examples and clear explanations which help users easily benefit from the eXo Platform capabilities and features.

After reading this guide, developers are expected to be able to customize their own portals and develop applications to run on eXo Platform 3.5 through the following topics:

- **Get Started:** Introduction to terms commonly used, how to set up Maven settings and eXo Architecture Primer.
- **Create Your Own Portal:** Steps on how to create and customize your own portal.
- **Work With Content:** Topics related to the eXo Platform content.
- **Work With Applications:** Instructions on how to integrate applications into your portal and how to deploy your own applications.
- **System Integration:** Topics related to the eXo Platform 3.5 integration into information systems through specific topics, such as authentication, user integration, LDAP integration and Email configuration.
- **System Integration:** Introduction to terms commonly used, how to set up Maven settings and eXo Architecture Primer.
- **eXo Platform 3.5 APIs:** Information of APIs.
- **Cookbook:** Introduction to Cookbook, particularly steps on how to copy a site to another eXo Platform server.
- **Upgrade eXo Platform:** Steps on how to upgrade eXo Platform from 3.0 to 3.5, especially when your system is an extension of eXo Platform 3.0 with many customizations related to configurations, components and added features.

Get Started

This chapter will provide you the basic knowledge of eXo Platform 3.5 through the following topics:

- [Glossary](#)
- [Set up Maven settings](#)
- [eXo Architecture Primer](#)

1.1. Glossary

This section gives you explanations of some technical terms which are used throughout the documentation.

Container templates

Templates which are used to contain the UI components in a specific layout and display them on the portal page.

ConversationState

An object which stores all information about the state of the current user. This object also stores acquired attributes of an Identity which is a set of principals to identify a user.

Data container

An object which implements the physical data storage. It enables different types of backend (such as RDB, FS files) to be used as a storage for the JCR data. With the main Data Container, other storages for persisted Property Values can be configured and used. The eXo JCR persistent data container can work in two configuration modes.

- **Multi-database:** A database for each workspace (used in the standalone eXo JCR service mode).
- **Single-database:** All workspaces persisted in one database (used in the embedded eXo JCR service mode; for example in eXo portal).

The data container uses the JDBC driver to communicate with the actual database software. For example, any JDBC-enabled data storage can be used with the eXo JCR implementation.

Database Creator (DBCreator)

A service that is responsible for executing the DDL (Data Definition Language) script in runtime. A DDL script may contain templates for database name, username, and password which will be replaced by real values at execution time.

Drives

Customized workspaces which include:

- a configured path where the user will start when browsing the drive.
- a set of views with limitations to available actions, such as editing or creating contents while being in the drive.
- a set of permissions to limit the access (and view) of the drive to a restricted number of people.
- a set of options to describe the behavior of the drive when users browse it.

eXo Cache

One which all applications on the top of eXo JCR need. This can rely on an *org.exoplatform.services.cache.ExoCache* instance managed by *org.exoplatform.services.cache.CacheService*.

eXoContainer

An object which behaves like a class loader that is responsible for loading services/components. The `eXoContainer` class is inherited by all the containers, including `RootContainer`, `PortalContainer`, and `StandaloneContainer`. It itself inherits from a `PicoContainer` framework which allows eXo to apply the IoC Inversion of Control principles.

External Plugin

One which allows adding configuration for services and components easily.

Folksonomy

A system of classification which is derived from the practice and a method of collaboratively creating and managing tags to annotate and categorize content. This practice is also known as collaborative tagging social classification social indexing and social tagging. For more details, see: <http://en.wikipedia.org>.

Gadgets

Web-based software components which are based on HTML, CSS, and JavaScript. They allow developers to easily write useful web applications that work anywhere on the web without modification. For more details, see: opensocial.org.

Groovy template

A template which is widely used in eXo UI framework. It leverages the usage of Groovy language, a scripting language for Java. The template file consists of HTML code and Groovy code blocks.

JCR WebDav

A service that allows accessing a JCR repository via WebDav.

JobSchedulerService

One which defines a job to execute a given number of times during a given period. It is a service that is in charge of unattended background executions commonly known for historical reasons as batch processing.

JodConverter (Java OpenDocument Converter)

A tool which converts documents into different office formats and vice versa.

JCR Item

One which may be a node or a property.

ListenerService

An event mechanism which allows triggering and listening to events under specific conditions inside eXo Platform. This mechanism is used in several places in eXo Platform, such as login/logout time, creating/updating users, and groups.

LockManager

One which stores lock objects, so it can give a lock object or can release it. Also, `LockManager` is responsible for removing Locks that live too long.

Namespace

The name of a node or property which may have a prefix delimited by a single ':' colon character. This name indicates the namespace of the item (Source: [JSR-170](#)) and is used to avoid the naming conflict.

Navigation node

A node which looks like a label of the link to page on the Navigation bar. By clicking a node, the page content is displayed. A node maps a URI and a portal page for the portal's navigation system.

Navigation

One which looks like a menu which is to help users visualize the site structure and to provide hyperlinks to other parts on a Portal. Thus, a bar which contains navigations is called the Navigation bar.

Node type

One which defines child nodes and properties which a node may (or must) have. Every node type has attributes, such as name, supertypes, mixin status, orderable child nodes status, property definitions, child node definitions and primary item name (Source: [JSR-170](#)).

Node

An element in the tree structure that makes up a repository. Each node may have zero or more child nodes and zero or more child properties. There is a single root node per workspace which has no parent. All other nodes have only one parent.

Organization listener

One which provides a mechanism to receive notifications via an organization listener, including `UserEventListener`, `GroupEventListener` and `MembershipEventListener`.

- `UserEventListener` is called when a user is created, deleted or modified.
- `GroupEventListener` is called when a group is created, deleted or modified.
- `MembershipEventListener` is called when a membership is created or removed.

Organization management

A portlet that manages users groups and memberships. This portlet is often managed by administrators to set up permission for users and groups.

OrganizationService

A service that allows accessing the Organization model. This model is composed of users, groups, and memberships. It is the basis of eXo's personalization and authorizations and is used for all over the platform.

Path constraint

One which restricts the result node to a scope specified by a path expression. The following path constraints must be supported exact child nodes descendants and descendants or self (Source: [JSR-170](#)).

Permission

A permission settings control which actions users can or cannot perform within the portal and are set by the portal administrators. Permission types specify what a user can do within the portal.

Portal Page

A page which consists of one or more various portlets. Their layouts are defined by container templates. To display a portal page, this page must be mapped to a navigation node.

Portal skins

Graphic styles which display an attractive user interface. Each skin has its own characteristics with different backgrounds, icons, color, and more.

PortalContainer

A type of container which is created at the startup of the portal web application in the `init` method of the `PortalController` servlet.

Portlet

A web-based application that provides a specific piece of content to be included as part of a portal page. In other words, portlets are pluggable user interface components that provide a presentation layer to information systems. There are two following types of portlet:

- **Functional Portlets** support all functions within the portal. They are integrated into the portal that can be accessed through toolbar links.
- **Interface Portlets** constitute the interface of a portal. eXo Portal consists of some Interface Portlets, such as Banner Portlet, Footer Portlet, Homepage Portlet, Console Portlet, Breadcrumb Portlet and more.

Property constraint

One which may be specified by a query on the result nodes by way of property constraints (Source: [JSR-170](#)).

Property

An element in the tree structure that makes up a repository. Each property has only one parent node and has no child node.

Repository

One which holds references to one or more workspaces.

eXo REST framework

One which is used to make eXo services (for example, the components deployed inside eXo Container) simply and transparently accessible via HTTP in a RESTful manner. In other words, those services should be viewed as a set of REST Resources-endpoints of the HTTP request-response chain. Those services are called **ResourceContainers**.

RootContainer

A base container which plays an important role during the startup. However, it is recommended that it should not be used directly.

RTL Framework (Right To Left Framework)

A framework which handles the text orientation depending on the current locale settings. It consists of four components, including Groovy template, Stylesheet, Images, and Client java.

StandaloneContainer

One which is a context independent eXo Container. It is also used for unit tests.

Taxonomy

One which is used to sort documents to ease searches when browsing documents online.

Tree structure

One structure which is defined as a hierarchical structure with a set of linked nodes and properties.

Type constraint

One which specifies the common primary node type of the returned nodes plus possibly additional mixin types that they also must have. Type constraints are inheritance-sensitive in which specifying a constraint of node type x will include all nodes explicitly declared to be type x and all nodes of subtypes of x (Source: [JSR-170](#)).

Web Content

A textual, visual or aural content that is encountered as part of the user experiences on a website. It may include other things, such as texts images, sounds, videos, and animations.

Workspace

A container of single rooted tree which includes items.

1.2. Set up Maven settings

Before setting up a complete project/extension, you need to have knowledge of how to install a Maven project.

Requirements

- JDK (Java Development Kit) 6.0
- SVN 1.6+
- Maven 2.2.1+

- Tomcat 6.0.32 or JBoss EAP 5.1.1

Install and configure Maven

You need to add a system environment variable `MAVEN_OPTS` (it could be in a `.profile` startup script on Linux/macOS operating systems or in the global environment variables panel on Windows).

- Windows:

```
set MAVEN_OPTS=-Xshare:auto -Xms128M -Xmx1G -XX:MaxPermSize=256M
```

- Linux/macOS:

```
export MAVEN_OPTS="-Xshare:auto -Xms128M -Xmx1G -XX:MaxPermSize=256M"
```

Maven settings

1. Save the `settings.xml` file to the `HOME/.m2/settings.xml` path.
2. Edit and change the `local-properties` profile, including:
 - `exo.projects.directory.dependencies` contains the application servers, and Openfire.
 - each `exo.projects.app.AS-NAME.version` contains the name and version of the application servers.

If the `settings.xml` file has been existing, you can merge them. You will need the followings:

- The `local-properties` profile, which defines properties, is used to build application server distributions of our products.
- The [repository](#) to download our dependencies.



Note

In Linux environments, the `ulimit` limits the system-wide resource used. When running eXo Platform, you may get the error message about "Too many open files" because the `ulimit` had limited the opened files. By default, the number of open files is limited to "1024". You should execute the command "`ulimit -n 8196`" as root before starting the server to avoid this issue.

See also

[Create your extension project](#)

[Create custom look and feel](#)

1.3. eXo Architecture Primer



Note

This section aims at helping readers further understand about the eXo architecture, including Kernel, GateIn extensions and Java Content Repository via concepts, services, configuration, and more.

1.3.1. Kernel

All eXo Platform services are built around the eXo Kernel, or the service management layer, which manages the configuration and the execution of all components. The main kernel object is the eXo Container, a micro-container that glues services together through the dependency injection. The container is responsible for loading services/components.

This part introduces concepts of **Container** and **Services** with an overview before configuring basic services.

1.3.1.1. Containers

A container is always required to access a service, because the eXo Kernel relies on the dependency injection. This means that the lifecycle of a service (for example, instantiating, opening and closing streams, disposing) is handled by a dependency provider, such as the eXo Container, rather than the consumer. The consumer only needs a reference to an implementation of the requested service. The implementation is configured in an *.xml* configuration file that comes with every service. To learn more about the dependency injection, visit [here](#).

eXo Platform provides two types of containers: *RootContainer* and *PortalContainer*.

The *RootContainer* holds the low level components. It is automatically started before the *PortalContainer*. You will rarely interact directly with the *RootContainer* except when you activate your own extension. The *PortalContainer* is created for each portal (one or several portals). All services started by this container will run as embedded in the portal. It also gives access to components of its parent *RootContainer*.

In your code, if you need to invoke a service of a container, you can use the *ExoContainerContext* helper from any location. The code below shows you a utility method that you can use to invoke any eXo Platform services.

```
public class ExoUtils {
    /**
     * Get a service from the portal container
     * @param type : component type
     * @return the concrete instance retrieved in the container using the type as key
     */
    public <T>T getService(Class<T> type) {
        return (T)ExoContainerContext.getCurrentContainer().getComponentInstanceOfType(type);
    }
}
```

Then, invoking becomes as easy as:

```
OrganizationService orgService = ExoUtils.getService(OrganizationService.class)
```

1.3.1.2. Services

Containers are used to gain access to services. The followings are important characteristics of services:

- Because of the Dependency Injection concept, the interface and implementation for a service are usually separate.
- Each service has to be implemented as a singleton, which means it is created only once per portal container in a single instance.
- A component equals a service. A service must not be a large application. A service can be a little component that reads or transforms a document where the term "component" is often used instead of service.

For example, in the `/lib` folder, you can find services for the following databases, caching, and LDAP:

- `exo.core.component.database-x.y.z.jar`
- `exo.kernel.component.cache-x.y.z.jar`
- `exo.core.component.organization.ldap-x.y.z.jar`

1.3.1.3. Service configuration

To declare a service, you must add the `.xml` configuration file to a specific place. This file can be in the jar file, in a webapp or in the external configuration directory. If you write a new component for the eXo Container, you should always provide a default configuration in your jar file. This default configuration must be in the `/conf/portal/configuration.xml` file in your jar.

A configuration file can specify several services, so there can be several services in one jar file.

This section is divided into the following sub-topics:

- [Kernel XML Schema](#)
- [Components](#)
- [Parameters](#)

1.3.1.3.1. Kernel XML Schema

Containers configuration files must comply with the kernel configuration grammar. Thus, all configurations will contain an XSD declaration like this:

```
<configuration xmlns="http://www.exoplatform.org/xml/ns/kernel_1_1.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.exoplatform.org/xml/ns/kernel_1_1.xsd http://www.exoplatform.org/xml/ns/kernel_1_1.xsd">
</configuration>
```

The `kernel_1_1.xsd` file mentioned in the example above can be found inside `exo.kernel.container-x.y.z.jar!org/exoplatform/container/configuration/` along with other versions.

1.3.1.3.2. Components

The service registration within the container is done with the `<component>` element.

For example, open the `/webapps/exo-wcm-core/WEB-INF/conf/wcm-core/core-services-configuration.xml`. You will see the following code:

```
<component>
  <key>org.exoplatform.services.cms.CmsService</key>
  <type>org.exoplatform.services.cms.impl.CmsServiceImpl</type>
</component>
```

Each component has a `key` which matches with the qualified Java interface name (`org.exoplatform.services.cms.CmsService`).

The specific implementation class of the component (CmsServiceImpl) is defined in the <type> tag.

If a service does not have a separate interface, the <type> will be used as the key in the container. This is the case of *ContentInitializerService*.

1.3.1.3.3. Parameters

You can provide initial parameters for your service by defining them in the configuration file. The followings are different parameters:

- [Value-param](#)
- [Object-param](#)
- Properties-param
- [Rest of parameter types](#)

1.3.1.3.3.1. Value-param

You can use the value-param to pass a single value to the service.

```
<component>
<key>org.exoplatform.services.resources.LocaleConfigService</key>
<type>org.exoplatform.services.resources.impl.LocaleConfigServiceImpl</type>
<init-params>
  <value-param>
    <name>locale.config.file</name>
    <value>war:/conf/common/locales-config.xml</value>
  </value-param>
</init-params>
</component>
```

The *LocaleConfigService* service accesses the value of value-param in its constructor.

```
package org.exoplatform.services.resources.impl;
public class LocaleConfigServiceImpl implements LocaleConfigService {
  public LocaleConfigServiceImpl(InitParams params, ConfigurationManager cmanager) throws Exception {
    configs_ = new HashMap<String, LocaleConfig>(10);
    String confResource = params.getValueParam("locale.config.file").getValue();
    InputStream is = cmanager.getInputStream(confResource);
    parseConfiguration(is);
  }
}
```

1.3.1.3.3.2. Object-param

For the object-param component, you can look at the LDAP service:

```
<component>
<key>org.exoplatform.services.ldap.LDAPService</key>
<type>org.exoplatform.services.ldap.impl.LDAPServiceImpl</type>
<init-params>
  <object-param>
    <name>ldap.config</name>
    <description>Default ldap config</description>
    <object type="org.exoplatform.services.ldap.impl.LDAPConnectionConfig">
      <field name="providerURL"><string>ldaps://10.0.0.3:636</string></field>
      <field name="rootdn"><string>CN=Administrator,CN=Users,DC=exoplatform,DC=org</string></field>
      <field name="password"><string>exo</string></field>
    </object>
  </object-param>
</init-params>
</component>
```

```

    <field name="version"><string>3</string></field>
    <field name="minConnection"><int>5</int></field>
    <field name="maxConnection"><int>10</int></field>
    <field name="referralMode"><string>ignore</string></field>
    <field name="serverName"><string>active.directory</string></field>
  </object>
</object-param>
</init-params>
</component>

```

The `object-param` is used to create an object (which is actually a Java Bean) passed as a parameter to the service. This `object-param` is defined by a name, a description and exactly one object. The `object` tag defines the type of the object, while the `field` tags define parameters for that object.

You can see how the service accesses the object in the code below:

```

package org.exoplatform.services.ldap.impl;

public class LDAPServiceImpl implements LDAPService {
    // ...
    public LDAPServiceImpl(InitParams params) {
        LDAPConnectionConfig config = (LDAPConnectionConfig) params.getObjectParam("ldap.config").getObject();
        ...
    }
    // ...
}

```

The passed object is *LDAPConnectionConfig*, which is a classic Java Bean. It contains all fields defined in the configuration files and also the appropriate getters and setters (not listed here). You also can provide default values. The container creates a new instance of your Java Bean and calls all setters whose values are configured in the configuration file.

```

package org.exoplatform.services.ldap.impl;

public class LDAPConnectionConfig {
    private String providerURL = "ldap://127.0.0.1:389";
    private String rootdn;
    private String password;
    private String version;
    private String authenticationType = "simple";
    private String serverName = "default";
    private int minConnection;
    private int maxConnection;
    private String referralMode = "follow";
    // ...
}

```

1.3.1.3.3. Rest of parameter types

Other possible parameter types are `Collection`, `Map` and `Native Array`. See the exhaustive reference in the Kernel reference guide.

1.3.1.4. Plugins

Some components may want to offer some extensibilities. For this, they use a plugin mechanism based on the injection method. To offer an extension point for plugins, a component needs to provide a public method that takes an instance of *org.exoplatform.container.xml.ComponentPlugin* as a parameter.

Plugins enable you to provide the structured configuration outside the original declaration of the component. This is the main way to customize eXo Platform to your needs.

You can have a look at the configuration of the TaxonomyPlugin of the TaxonomyService as below:

```
<external-component-plugins>
<target-component>org.exoplatform.services.cms.taxonomy.TaxonomyService</target-component>
<component-plugin>
  <name>predefinedTaxonomyPlugin</name>
  <set-method>addTaxonomyPlugin</set-method>
  <type>org.exoplatform.services.cms.taxonomy.impl.TaxonomyPlugin</type>
  <init-params><!-- ... --></init-params>
</component-plugin>
</external-component-plugins>
```

The `<target-component>` defines components that host the extension point. The configuration is injected by the container using the method defined in `<set-method>` (`addTaxonomyPlugin()`). The method accepts exactly one argument of the `org.exoplatform.services.cms.categories.impl.TaxonomyPlugin` type.

The content of `<init-params>` is interpreted by the `TaxonomyPlugin` object.

1.3.1.5. Configuration loading sequence

The Kernel startup follows a well-defined sequence to load configuration files. The objects are initialized in the container only after the whole loading sequence is done. Hence, by placing your configuration in the upper location of the sequence, you can override a component declaration by yourself. You will typically do this when you want to provide your own implementation of a component, or declare custom `init-params`.



Note

The *external-component-plugins* declarations are additive, so it is NOT possible to override them.

Configurations for the *RootContainer* are loaded first, and then for the *PortalContainers*.

- Services default *RootContainer* configurations from JAR files: `/conf/configuration.xml`.
- External *RootContainer* configuration will be found at `$exo.conf.dir/configuration.xml`.
- Services default *PortalContainer* configurations from JAR files: `/conf/$PORTAL/configuration.xml`.
- Web applications configurations from WAR files `/WEB-INF/conf/configuration.xml`.
- External configuration for services of the portal will be found at `$exo.conf.dir/portal/$PORTAL/configuration.xml`.



Note

- `$exo.conf.dir` is a system property which points to the folder containing external configuration files on the file system. It is passed to the JVM in the startup script like `-Dexo.conf.dir=gatein`.
- `$PORTAL` is the name of the portal container. By default, the name "portal" is unique.

1.3.2. GateIn extensions

GateIn extensions are special `.war` files that are recognized by eXo Platform and contribute to custom configurations to the *PortalContainer*. To create your own portal, you will have to create a GateIn extension.

The extension mechanism makes possible to extend or even override portal resources in almost plug-and-play way. You simply add a `.war` archive with your custom resources to the `war` folder and edit the configuration of the *PortalContainerConfig* service. Customizing a portal does not involve unpacking and repacking the original portal `.war` archives. Instead, you need

to create your own *.war* archive with your own configurations, and modify resources. The content of your custom *.war* archive overrides the resources in the original archives.

The most elegant way to reuse configuration for different coexisting portals is by way of extension mechanism. That is, you can inherit resources and configurations from existing web archives, then simply add extra resources and configurations to your extension, and override ones which need to be changed by including modified copies.



Note

Starter is a web application which has been added to create and start all the portal containers once all the other web applications have already been started. Generally, each web application of a portal container defines several things, such as skins, JavaScripts, Google gadgets and configuration files, at its startup, so the loading order is important. For example, at startup of the web application 1, skins or configuration files or JavaScripts are defined that could depend on another JavaScript from the web application 2. Thus, if the web application 2 is loaded after the web application 1, you will get errors in the merged JavaScript file.

If you ship servlets or servlet filters as part of your portal extension, and these servlets/servlet filters need to access specific resources of a portal during the process of the servlets or filters request, make sure that these servlets/filters are associated with the current portal container. The proper way to do that is making your servlet extend the *org.exoplatform.container.web.AbstractHttpServlet* class. This will not only properly initialize the current *PortalContainer* for you, but also set the current thread's context *ClassLoader* to servlets or servlet filters which looks for resources in associated web applications in the order specified by dependencies configuration.

As similar to filters, make sure that your filter class extends *org.exoplatform.container.web.AbstractFilter*. Both *AbstractHttpServlet* and *AbstractFilter* have the method named *getContainer()*, which returns the current *PortalContainer*.

1.3.2.1. Default Portal Container

eXo Platform comes with a pre-configured *PortalContainer* named "portal". The configuration of this portal container ties the core and the extended services stack. The default Portal Container is started from *portal.war* and naturally maps to the */portal/* URL.

The GateIn extension mechanism lets you extend the portal context easily. With this feature, you only need to make your desired modifications on your extension, but NOT on the *portal.war*. As a result, your upgrades will become simple as your *extension.war* is totally independent of the *portal.war*.

This extensibility is achieved via 2 advanced features of the *PortalContainer*.

- A unified *ClassLoader*: any classpath resource, such as property files, will be accessible as if it was inside the *portal.war*.



Note

This is valid only for resources but not for Java classes.

- A unified *ServletContext*: any web resources contained in your *extension.war* will be accessible from */portal/* uri.

For more details on how to make a simple extension for a "portal" container, see the [Register Extension](#) section.

1.3.2.2. Register Extension

The webapps are loaded in the order defined in the list of dependencies of the *PortalContainerDefinition*. You then need to deploy the *starter.war*; otherwise, the webapps will be loaded in the default application server's order, such as the loading order of the Application Server.

If you need to customize your portal by adding a new extension and/or a new portal, you need to define the related *PortalContainerDefinitions* and to deploy the starter. Otherwise, you do not need to define any *PortalContainerDefinition*.

First, you need to tell eXo Platform to load *WEB-INF/conf/configuration.xml* of your extension, you need to declare it as a *PortalContainerConfigOwner*. Next, open the file *WEB-INF/web.xml* of your extension and add a listener:

```
<web-app>
  <display-name>my-portal</display-name>
  <listener>
    <listener-class>org.exoplatform.container.web.PortalContainerConfigOwner</listener-class>
  </listener>
<!-- ... -->
</web-app>
```

You need to register your extension in the portal container. This is done by the *.xml* configuration file like this:

```
<external-component-plugins>
  <target-component>org.exoplatform.container.definition.PortalContainerConfig</target-component>
  <component-plugin>
    <name>Change PortalContainer Definitions</name>
    <set-method>registerChangePlugin</set-method>
    <type>org.exoplatform.container.definition.PortalContainerDefinitionChangePlugin</type>
    <init-params>
      <object-param>
        <name>change</name>
        <object type="org.exoplatform.container.definition.PortalContainerDefinitionChange$AddDependencies">
          <field name="dependencies">
            <collection type="java.util.ArrayList">
              <value>
                <string>my-portal</string>
              </value>
              <value>
                <string>my-portal-resources</string>
              </value>
            </collection>
          </field>
        </object>
      </object-param>
      <value-param>
        <name>apply.default</name>
        <value>true</value>
      </value-param>
    </init-params>
  </component-plugin>
</external-component-plugins>
```

A *PortalContainerDefinitionChangePlugin* plugin is defined to the *PortalContainerConfig*. The plugin declares a list of dependencies that are webapps. The *apply.default=true* indicates that your extension is actually extending *portal.war*. You need to package your extension into a *.war* file and put it to the tomcat webapps folder, then restart the server.

In your portal, if you want to add your own property file to support localization for your keys, you can do as follows:

- Put your property file into the */WEB-INF/classes/locale/portal* folder of your extension project.
- Add an external plugin declaration to the *.xml* configuration file.

```
<external-component-plugins>
  <!-- The full qualified name of the ResourceBundleService -->
  <target-component>org.exoplatform.services.resources.ResourceBundleService</target-component>
  <component-plugin>
    <!-- The name of the plugin -->
    <name>Sample ResourceBundle Plugin</name>
    <!-- The name of the method to call on the ResourceBundleService in order to register the ResourceBundles -->
    <set-method>addResourceBundle</set-method>
```

```

<!-- The full qualified name of the BaseResourceBundlePlugin -->
<type>org.exoplatform.services.resources.impl.BaseResourceBundlePlugin</type>
<init-params>
  <!--values-param>
    <name>classpath.resources</name>
    <description>The resources that start with the following package name should be load from file system</description>
    <value>locale.portlet</value>
  </values-param-->
  <values-param>
    <name>init.resources</name>
    <description>Store the following resources into the db for the first launch </description>
    <value>locale.portal.sample</value>
  </values-param>
  <values-param>
    <name>portal.resource.names</name>
    <description>The properties files of the portal , those file will be merged
    into one ResoruceBundle properties </description>
    <value>locale.portal.sample</value>
  </values-param>
</init-params>
</component-plugin>
</external-component-plugins>

```

1.3.3. Java Content Repository

All data of eXo Platform are stored in a Java Content Repository (JCR). JCR is the Java specification ([JSR-170](#)) for a type of Object Database tailored to the storage, searching, and retrieval of hierarchical data. It is useful for the content management systems, which require storage of objects associated with metadata. The JCR also provides versioning, transactions, observations of changes in data, and import or export of data in XML. The data in JCR are stored hierarchically in a tree of nodes with associated properties.

Also, the JCR is primarily used as an internal storage engine. Accordingly, eXo Content lets you manipulate JCR data directly in several places.

1.3.3.1. Repositories and workspaces

A content repository consists of one or more workspaces. Each workspace contains a tree of items.

Access the repository's content from a service

1. Get the session object.

```

import javax.jcr.Session;

import org.exoplatform.services.jcr.RepositoryService;
import org.exoplatform.services.jcr.core.ManageableRepository;
import org.exoplatform.services.jcr.ext.common.SessionProvider;
import org.exoplatform.services.wcm.utils.WCMCoreUtils;

// For example
RepositoryService repositoryService = WCMCoreUtils.getService(RepositoryService.class);
ManageableRepository manageableRepository = repositoryService.getRepository(repository);
SessionProvider sessionProvider = WCMCoreUtils.getSessionProvider();
Session session = sessionProvider.getSession(workspace, manageableRepository);

```

i. Obtain the *javax.jcr.Repository* object via one of the following ways:

The first way

Call the *getRepository()* method of *RepositoryService*.

```
RepositoryService repositoryService = (RepositoryService) container.getComponentInstanceOfType(RepositoryService.class);
Repository repository = repositoryService.getRepository("repositoryName");
```

The second way

Call the *getCurrentRepository()* method, especially when you plan to use a single repository which covers more than 90% of usecases.

```
// set current repository at initial time
RepositoryService repositoryService = (RepositoryService) container.getComponentInstanceOfType(RepositoryService.class);
repositoryService.setCurrentRepositoryName("repositoryName");
....
// retrieve and use this repository
Repository repository = repositoryService.getCurrentRepository();
```

The third way

Using JNDI as specified in [JSR-170](#).

```
Context ctx = new InitialContext();
Repository repository =(Repository) ctx.lookup("repositoryName");
```

ii. Log in the server to get a Session object by either of two ways:

The first way

Create a Credential object, for example:

```
Credentials credentials = new SimpleCredentials("exo", "exo".toCharArray());

Session jcrSession = repository.login(credentials, "production");
```

The second way

Log in the server without using a Credential object.

```
Session jcrSession = repository.login("production");
```

This way is only applied when you run an implementation of eXo Platform. The eXo Platform implementation will directly leverage the organization and security services that rely on LDAP or DB storage and JAAS login modules. Single-Sign-On products can now also be used as eXo Platform v.2 which supports them.



Note

There are some JCR Session common considerations as follows:

Because *javax.jcr.Session* is not a safe object of thread, it is recommended that you should not share it between threads.

Do not use the System session from the user-related code because a system session has unlimited rights. Call *ManageableRepository.getSession()* from the process-related code only.

Call *Session.logout()* explicitly to release resources assigned to the session.

When designing your application, you should take care of the Session policy inside your application. Two strategies are possible: Stateless (Session per business request) and Stateful (Session per User) or some mixings.

2. Retrieve your node content of the session object.

```
String path = "/"; // put your node path here
```

```
Node node = (Node) session.getItem(path);
```

1.3.3.2. Tree structure: working with nodes and properties

Every node can only have one primary node type. The primary node type defines names, types and other characteristics of the properties, and the number of its allowed child nodes. Every node has a special property called *jcr:primaryType* that records the name of its primary node type. A node may also have one or more mixin types. These are node type definitions that can mandate extra characteristics (for example, more child nodes, properties and their respective names and types).

Data are stored in properties, which may hold simple values, such as numbers, strings or binary data of arbitrary length.

The JCR API provides methods to define node types and node properties, create or delete nodes, and add or delete properties from an existing node.

You can refer to the "6.2.3 Node Read Methods" in the JCR Specification document.

Create Your Own Portal

When working with eXo Platform, it is important not to modify the source code. This will ensure compatibility with future upgrades, and support will be simplified. To customize your portal, you need to create an extension project by providing your own artifacts as a set of wars/jars/ears.

This chapter will show you how to create a portal via the following topics:

- [Create your extension project](#)
- [Define a default portal](#)
- [Structure of portal, pages and menus](#)
- [Enable/Disable a drive creation during the portal creation](#)
- [Add/Remove a language](#)
- [Create a custom look and feel](#)
- [Add JavaScript to your portal](#)
- [Create custom templates for pages](#)

2.1. Create your extension project

A custom extension contains two mandatory items:

- **extension webapp** contains resources and kernel configurations.
- **extension activator jar** identifies your webapp as a dependency of the portal container.

To see the sample extension package, visit [here](#).

Once you have modified the sample extension to build your own portal, use the *maven clean install* command to create the archive files.

Deploy your extension in Tomcat

1. Add the *sample-ext.war* file from the *sample/extension/war/target/* to the *tomcat/webapps* directory.
2. Add the *starter* folder from *starter/war/target/* to the *tomcat/webapps* directory.
3. Rename the *starter* directory (unzipped folder) to *starter.war*.



Note

This will only work if the *starter.war* is the last .war file to be loaded, so you may need to rename it if your war files are loaded in the alphabetical order.

4. Add the .jar file named *exo.portal.sample.extension.config-X.Y.Z.jar* from *sample/extension/config/target/* to the *tomcat/lib* directory.
5. Add the .jar file named *exo.portal.sample.extension.jar-X.Y.Z.jar* from *sample/extension/jar/target/* to the *tomcat/lib* directory.

6. Create a sample-ext.xml file (this file is a [Context Descriptor](#) to configure a context within Tomcat server and to ensure that the extension gets loaded before the starter.war). Then add this file to the `tomcat/conf/Catalina/localhost` directory with the following content.

```
<Context crossContext="true" debug="0" docBase="sample-ext" path="/sample-ext" reloadable="true"/>
```

For the JBoss deployment with more details, refer to the [GateIn Reference Guide](#).

2.2. Define a default portal

When entering the link of the portal in the address bar of the browser without defining a specific portal (e.g. `localhost:8080/portal/`), you will be directed to a default portal.

To configure the default portal, the portal must already exist first. Then, you just use the `NewPortalConfigListener` plugin as the sample code below.

To use this plugin in the component configuration, you must use the following target-component:

```
<target-component>org.exoplatform.portal.config.UserPortalConfigService</target-component>
```

The sample code below is the configuration of the portal named `"default"`.

```
<external-component-plugins>
  <target-component>org.exoplatform.portal.config.UserPortalConfigService</target-component>
  <component-plugin>
    <name>default.portal.config.user.listener</name>
    <set-method>initListener</set-method>
    <type>org.exoplatform.portal.config.NewPortalConfigListener</type>
    <description>this listener init the portal configuration</description>
    <init-params>
      <value-param>
        <name>default.portal</name>
        <description>The default portal for checking db is empty or not</description>
        <value>default</value>
      </value-param>
      <object-param>
        ....
      </object-param>
    </init-params>
  </component-plugin>
</external-component-plugins>
```

Init-param

Name	Type	Value	Description
default.portal	String	default	The name of the default portal to which you are redirected when accessing the portal.

2.3. Structure of portal, pages and menus

You can create multiple pages within a single portal. Permissions can be defined to make them visible only to specific groups and/or users. This chapter describes how to define this structure.

2.3.1. Portal navigation

The portal navigation incorporates the pages that can be accessed even when the user is not logged in assuming the applicable permissions allow the public access). For example, several portal navigations are used when a company owns multiple trademarks, and sets up a website for each of them.

The configuration of the "classic" portal can be found in the `/src/main/WEB-INF/conf/portal/portal/classic` directory of your extension webapp.

portal.xml

The `portal.xml` file describes the layout and portlets that will be shown on all pages. The layout usually contains the banner, footer, menu and breadcrumbs portlets. eXo Platform 3.5 is extremely configurable as every view element (even the banner and footer) is a portlet.

```
<portal-config xmlns="http://www.gatein.org/xml/ns/gatein_objects_1_0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.gatein.org/xml/ns/gatein_objects_1_0 http://www.gatein.org/xml/ns/gatein_objects_1_0">
  <portal-name>classic</portal-name>
  <locale>en</locale>
  <access-permissions>Everyone</access-permissions>
  <edit-permission>*/platform/administrators</edit-permission>
  <properties>
    <entry key="sessionAlive">onDemand</entry>
    <entry key="showPortletInfo">1</entry>
  </properties>

  <portal-layout>
    <portlet-application>
      <portlet>
        <application-ref>web</application-ref>
        <portlet-ref>BannerPortlet</portlet-ref>
        <preferences>
          <preference>
            <name>template</name>
            <value>par:/groovy/groovy/webui/component/UIBannerPortlet.gtmpl</value>
            <read-only>false</read-only>
          </preference>
        </preferences>
      </portlet>
      <access-permissions>Everyone</access-permissions>
      <show-info-bar>false</show-info-bar>
    </portlet-application>

    <portlet-application>
      <portlet>
        <application-ref>web</application-ref>
        <portlet-ref>NavigationPortlet</portlet-ref>
      </portlet>
      <access-permissions>Everyone</access-permissions>
      <show-info-bar>false</show-info-bar>
    </portlet-application>

    <portlet-application>
      <portlet>
        <application-ref>web</application-ref>
        <portlet-ref>BreadcrumbsPortlet</portlet-ref>
      </portlet>
      <access-permissions>Everyone</access-permissions>
      <show-info-bar>false</show-info-bar>
    </portlet-application>
  </portal-layout>
</portal-config>
```

```

</portlet-application>

<page-body> </page-body>

<portlet-application>
  <portlet>
    <application-ref>web</application-ref>
    <portlet-ref>FooterPortlet</portlet-ref>
    <preferences>
      <preference>
        <name>template</name>
        <value>par:/groovy/groovy/webui/component/UIFooterPortlet.gtmpl</value>
        <read-only>false</read-only>
      </preference>
    </preferences>
  </portlet>
  <access-permissions>Everyone</access-permissions>
  <show-info-bar>false</show-info-bar>
</portlet-application>

</portal-layout>

</portal-config>

```

Each portlet can be configured with a set of preferences, which will be further detailed in the [Work With Applications](#) chapter.

It is also possible to apply a nested container that can also contain portlets. Row, column or tab containers are then responsible for the layout of their child portlets.

Each application references a portlet using the id: *portal#{portalName}:/[portletWarName]/[portletName]/[uniqueId]*

The `<page-body> </page-body>` tag is a placeholder for the different pages of your portal, it defines where Platform should render the current page. When the user opens a new portal page, all portlets of the portal layout (*portal.xml*) are remained, whereas the content of `<page-body>` switches to the page opened by the user.

The defined "classic" portal is accessible to "Everyone" (at */portal/classic*) but only members of the group */platform/administrators* can edit it.

pages.xml

The structure of the *pages.xml* configuration file is very similar to that in the *portal.xml* of the "classic" portal and it can also contain container tags. Each application can decide whether to render the portlet border, the window state, the icons or portlet's mode.

This is the example of the *pages.xml* file of the "classic" portal.

```

<page-set xmlns="http://www.gatein.org/xml/ns/gatein_objects_1_0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.gatein.org/xml/ns/gatein_objects_1_0 http://www.gatein.org/xml/ns/gatein_objects_1_0">

  <page>
    <name>homepage</name>
    <title>Home Page</title>
    <access-permissions>Everyone</access-permissions>
    <edit-permission>*/platform/administrators</edit-permission>
    <portlet-application>
      <portlet>
        <application-ref>web</application-ref>
        <portlet-ref>HomePagePortlet</portlet-ref>
        <preferences>
          <preference>
            <name>template</name>
            <value>system:/templates/groovy/webui/component/UIHomePagePortlet.gtmpl</value>
            <read-only>false</read-only>
          </preference>
        </preferences>
      </portlet>
    </portlet-application>
  </page>
</page-set>

```

```

<title>Home Page portlet</title>
<access-permissions>Everyone</access-permissions>
<show-info-bar>false</show-info-bar>
<show-application-state>false</show-application-state>
<show-application-mode>false</show-application-mode>
</portlet-application>
</page>

<page>
<name>sitemap</name>
<title>Site Map</title>
<access-permissions>Everyone</access-permissions>
<edit-permission>*/platform/administrators</edit-permission>
<portlet-application>
  <portlet>
    <application-ref>web</application-ref>
    <portlet-ref>SiteMapPortlet</portlet-ref>
  </portlet>
  <title>SiteMap</title>
  <access-permissions>Everyone</access-permissions>
  <show-info-bar>false</show-info-bar>
</portlet-application>
</page>
.....
</page-set>

```



Note

See the [Work With Applications](#) chapter to learn more about the portlet configuration within the *pages.xml* file.

navigation.xml

The *navigation.xml* file defines all the navigation nodes of the portal. The syntax is simply using the nested node tags. Each node refers to a page defined in the *pages.xml* file that will be explained later.

If the administrator wants to create node labels for each language, he will have to use *xml:lang* attribute in the label tag with the value of *xml:lang* is set to the relevant locale.

Otherwise, if the administrator wants the node label is localized by resource bundle files, the *#{...}* syntax will be used. The enclosed property name serves as a key that is automatically passed to the internationalization mechanism. Thus, the emphasis property name is replaced with a localized value taken from the associated properties file matching the current locale.

```

<node-navigation>
  <owner-type>portal</owner-type>
  <owner-id>classic</owner-id>
  <priority>1</priority>
  <page-nodes>
    <node>
      <uri>home</uri>
      <name>home</name>
      <label>#{portal.classic.home}</label>
      <page-reference>portal::classic::homepage</page-reference>
    </node>
    <node>
      <uri>webexplorer</uri>
      <name>webexplorer</name>
      <label>#{portal.classic.webexplorer}</label>
      <page-reference>portal::classic::webexplorer</page-reference>
    </node>
  </page-nodes>

```

```
</node-navigation>
```

This navigation tree is shown and reused in different portlets, such as sitemap, navigation or breadcrumbs. The breadcrumbs portlet renders the position of the current navigation node.



Note

For the top nodes, the URI and the navigation node name must have the same value. For other nodes, the URI is composed like `<uri>contentmanagement/fileexplorer</uri>` where 'contentmanagement' is the name of the parent node, and 'fileexplorer' is the name of node (`<name>fileexplorer</name>`).

2.3.2. Visibility of pages

When you configure the *navigation.xml* file, sometimes you need to set the visibility of page (node).

To configure the page visibility, simply put `<visibility>type_of_visibility</visibility>` as a child of the `<node>` tag.

eXo Platform supports 4 types of page visibility, including:

- **DISPLAYED**: The page will be displayed.
- **HIDDEN**: The page is not visible in the navigation but can be accessed directly with its URL.
- **SYSTEM**: It is a system page which is visible to superusers. In particular, only superusers can change or delete this system page.
- **TEMPORAL**: The page is displayed in related time range. When the visibility of TEMPORAL page is configured, the start and end date can be specified by using `<startpublicationdate>` and `<endpublicationdate>`. For example:

```
<node>
...
<visibility>TEMPORAL</visibility>
<startpublicationdate>01/13/2011 12:46:38</startpublicationdate>
<endpublicationdate>01/20/2011 18:46:42</endpublicationdate>
</node>
```

- To hide a page from menu and navigation, use `<visibility>HIDDEN</visibility>`:

```
<node-navigation xmlns="http://www.gatein.org/xml/ns/gatein_objects_1_0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.gatein.org/xml/ns/gatein_objects_1_0 http://www.gatein.org/xml/ns/gatein_objects_1_0">
  <page-nodes>
    <node>
      <uri>sitemap</uri>
      <name>sitemap</name>
      <label>#{portal.classic.sitemap}</label>
      <visibility>HIDDEN</visibility>
      <page-reference>portal::classic::sitemap</page-reference>
    </node>
    ...
  </page-nodes>
</node-navigation>
```

2.3.3. Page access permission

You can easily restrict the access of selected pages and navigation nodes to certain groups and users. You just need to create *pages.xml* and *navigation.xml* files in folders named after groups and users to which you want to give permission:

- *sample-ext/portal/group/group-name/your files*
- *sample-ext/portal/user/username/your files*

As you know, the permission on a page has two types: access (view the page) and edit.

To configure them, edit the *pages.xml* file and put tags: *<access-permissions>* and *<edit-permission>*.

Currently, eXo Platform supports several access permissions but only one edit permission. It means that you can configure to make many groups to have the access permission but you can only set one group for edit permission.

For example:

```
<page>
  <name>newStaff</name>
  <title>New Staff</title>
  <access-permissions>manager:/organization/management/executive-board;member:/organization/management/executive-board</access-permissions>
  <edit-permission>manager:/organization/management/executive-board</edit-permission>
  ...
</page>
```

2.4. Enable/Disable a drive creation during the portal creation

When a portal is created, a drive with the same name as the portal is also automatically created. However, you can decide if such a drive is automatically created or not by using two parameters named *autoCreatedDrive*, and *targetDrives* in the *CreateLivePortalEventListener* external component plugin.

```
<external-component-plugins>
  <target-component>org.exoplatform.services.listener.ListenerService</target-component>
  <component-plugin>
    <name>org.exoplatform.portal.config.DataStorage.portalConfigCreated</name>
    <set-method>addListener</set-method>
    <type>org.exoplatform.services.wcm.portal.listener.CreateLivePortalEventListener</type>
    <description>this listener creates a new live portal content storage.</description>
    <init-params>
      <value-param>
        <name>autoCreatedDrive</name>
        <description>A drive will be automatically created during the portal creation.</description>
        <value>false</value>
      </value-param>
      <values-param>
        <name>targetDrives</name>
        <description>The list of drives which are automatically created during the portal creation with "autoCreatedDrive=false".</description>
        <value>acme</value>
      </values-param>
    </init-params>
  </component-plugin>
</external-component-plugins>
```

- If *autoCreatedDrive=true*, a drive will be automatically created during the portal creation regardless of *targetDrives*. In case *autoCreatedDrive* is not specified, then its default value is *true*.
- If *autoCreatedDrive=false*, only drives listed in *targetDrives* are created. In case *targetDrives* is not specified, no drives are created.

2.5. Add/Remove a language

Developer can define new or remove a defined language through the locale configuration file. The resource is managed by `org.exoplatform.services.resources.LocaleConfigService` as following:

```
<component>
  <key>org.exoplatform.services.resources.LocaleConfigService</key>
  <type>org.exoplatform.services.resources.impl.LocaleConfigServiceImpl</type>
  <init-params>
    <value-param>
      <name>locale.config.file</name>
      <value>war:/conf/common/locales-config.xml</value>
    </value-param>
  </init-params>
</component>
```

All languages defined in the `locale-config.xml` file are listed in the [Interface Language Settings](#) window.

2.5.1. Add a new language

To add a new language, you need to add the corresponding language node in the `locale-config.xml` file. Next, you must create a new *resource bundle* file containing the suffix name as the key of the added node.

For example, to add Italian, do as follows:

1. Add the following node to the `locale-config.xml` file.

```
<locale-config>
  <locale>it</locale>
  <output-encoding>UTF-8</output-encoding>
  <input-encoding>UTF-8</input-encoding>
  <description>Default configuration for Italian locale</description>
</locale-config>
```

2. Create a new *resource bundle* as **webui_it.properties** in the `myextension.war/WEB-INF/classes/locale/portal` folder.

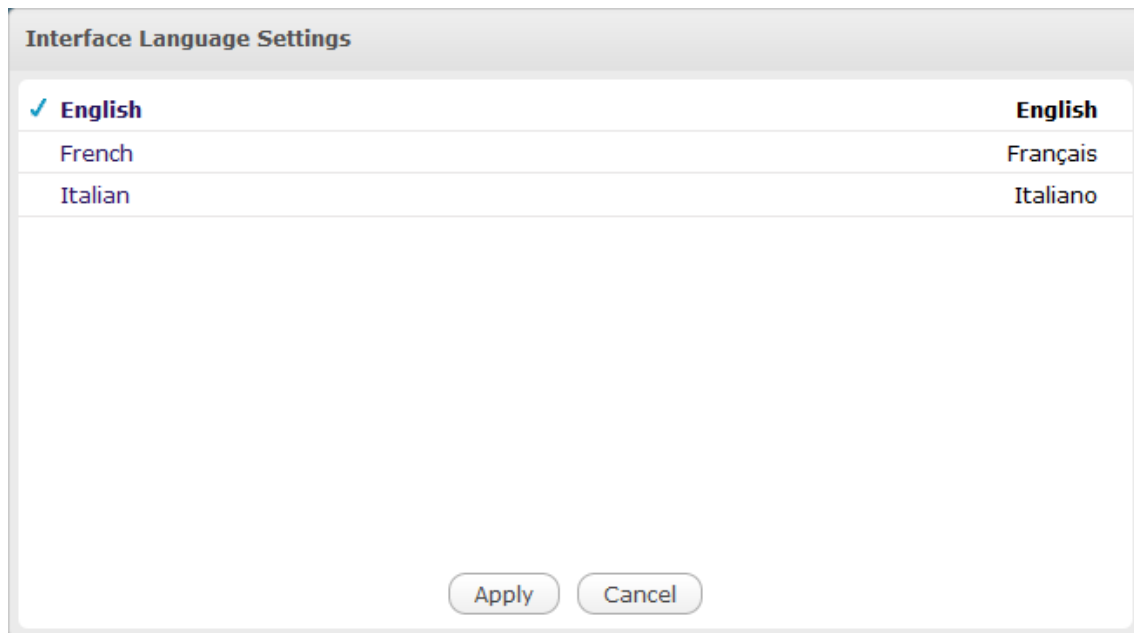


Note

This step is necessary because the Resource Bundle Service of the portal will find keys and values in the *resource bundle* of each corresponding language.

3. Restart the server.

To check if the added language takes effect, hover the mouse over your username on the **Administration** bar and click **Change Language**. In the **Interface Language Settings** window that appears, you will see the Italian is listed as below:



2.5.2. Remove a language

To remove an existing language, you need to delete the relevant language node in the *locale-config.xml* file and all files containing the suffix name as the key of language.

For example, to remove French, do as follows:

1. Find and remove the following node from the *locale-config.xml* file.

```
<locale-config>
  <locale>fr</locale>
  <output-encoding>UTF-8</output-encoding>
  <input-encoding>UTF-8</input-encoding>
  <description>Default configuration for france locale</description>
</locale-config>
```

2. Continue removing all *resource bundle* files containing the suffix name as **fr** in all folders.



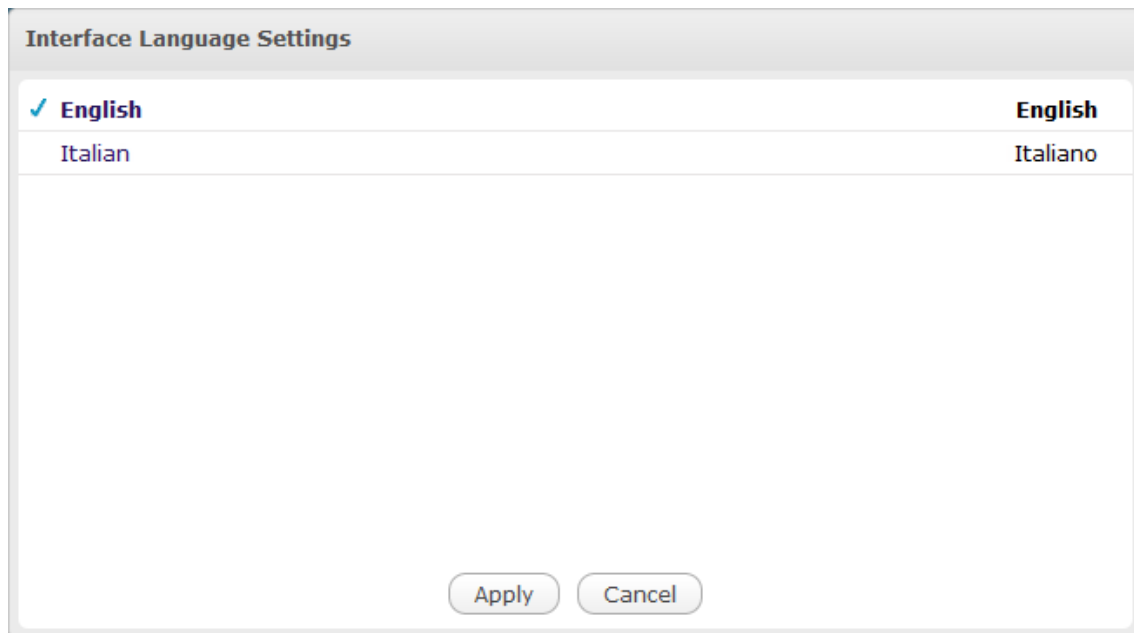
Note

It is recommended this step be done to delete unnecessary data in the application.

3. Restart the server.

To check if French is removed, hover the mouse over your username on the **Administration bar** and click the **Change Language**.

In the **Interface Language Settings** window that appears, French is no longer listed.



2.6. Create a custom look and feel

2.6.1. Platform skin elements

Platform provides support for skinning the entire portal User Interface (UI) including your own portlets. Skins are designed to help you pack and reuse common graphic resources.

The complete skinning of can be decomposed into three main parts: Portal skin, Window style, Portlet skin.

Portal skin

The portal skin contains styles for the HTML tags (for example, div, th, td) and the portal UI (including the toolbar). This should include all UI components, except for window decorators and portlet specific styles.

Window style

The CSS styles are associated with the portlet window decorators. The window decorators contain control buttons and borders surrounding each portlet. Individual portlets can have their own window decorators selected, or be rendered without one.



Portlet skin

The portlet skins affect how portlets are rendered on the page. The portlet skins can affect in two main ways described in the following sections.

Portlet Specification CSS Classes

The [portlet specification](#) defines a set of CSS classes that should be available to portlets. eXo Platform provides these classes as a part of the portal skin. This enables each portal skin to define its own look and feel for these default values.

Portlet skins

eXo Platform provides a means for portlet CSS files to be loaded that is based on the current portal skin. This enables a portlet to provide different CSS styles to better match the current portal's look and feel.



Note

The window decorators and the default portlet specification CSS classes should be considered as separate types of skinning components, but they need to be included as a part of the overall portal skin. The portal skin must include CSS classes of these components or they will not be displayed correctly. A portlet skin does not need to be included as a part of the portal skin and can be included within the portlets web application.

2.6.1.1. SkinService

Platform skin is processed by the SkinService. It is used to discover and deploy skins into the portal.

- **Configure skins**

In eXo Platform 3.5 has a file descriptor for skins (WEB-INF/gatein-resources.xml) which is to specify which portal, portlet and window decorators will be deployed into the skin service. Platform can automatically discover web archives containing this file gatein-resource.xml. The full schema can be found in the lib directory: *exo.portal.component.portal.jar/gatein_resources_1_0.xsd*.

Here is the *gatein-resources.xml* file of a sample skin (called "MySkin") which defines the portal skin with its CSS location, window style and its portlet skins:

```
<gatein-resources>
<!-- define the portal skin -->
```

```

<portal-skin>
  <skin-name>MySkin</skin-name>
  <css-path>/skin/myskin.css</css-path>
  <overwrite>false</overwrite>
</portal-skin>

<!-- define the portlet skin -->

<portlet-skin>
  <application-name>web</application-name>
  <portlet-name>HomePagePortlet</portlet-name>
  <skin-name>Default</skin-name>
  <css-path>/templates/skin/webui/component/UIHomePagePortlet/DefaultStylesheet.css</css-path>
  <overwrite>false</overwrite>
</portlet-skin>

<!-- define the window style -->
<window-style>
  <style-name>MyThemeCategory</style-name>
  <style-theme>
    <theme-name>MyThemeBlue</theme-name>
  </style-theme>
  <style-theme>
    <theme-name>MyThemeRed</theme-name>
  </style-theme>
</window-style>
</gatein-resources>

```

2.6.1.2. ResourceRequestFilter

The ResourceRequestFilter is used to map process skin request mapping from portal, portlet to the exact skin that was defined in portal. ResourceRequestFilter is configured in the *web.xml* file in the skin web archive.

```

<webapp>
  <display-name>eXoResources</display-name>
  <filter>
    <filter-name>ResourceRequestFilter</filter-name>
    <filter-class>org.exoplatform.portal.application.ResourceRequestFilter</filter-class>
  </filter>
  <filter-mapping>
    <filter-name>ResourceRequestFilter</filter-name>
    <url-pattern>*.css</url-pattern>
  </filter-mapping>
</webapp>

```



Note

The configuration of Portlet Skin takes an optional parameter *application-name*, which is the web application wrapping skinned portlet. Hence, the *display-name* element in *web.xml* needs to be coherent with the *application-name* in the *gatein-resources.xml* file.

2.6.1.3. The default skin

The default skin of eXo Platform 3.5 is in the *eXoResource.war* file. The main files associated with the skin are:

- *WEB-INF/gatein-resources.xml* defines the skin settings to use.
- *WEB-INF/web.xml* contains the resource filter with the *display-name* set.
- *skin/Stylesheet.css* contains the CSS class definitions for this skin.



Note

To get a new portal skin declared in *gatein-resources.xml* loaded successfully, *display-name* of the extension webapp (in *web.xml*) should be identical to the context path of the extension webapp.

The following block of CSS illustrates content of the *skin/Stylesheet.css* file:

```
@import url(DefaultSkin/portal/webui/component/UIPortalApplicationSkin.css); (1)
@import url(DefaultSkin/webui/component/Stylesheet.css); (2)
@import url(PortletThemes/Stylesheet.css); (3)
@import url(Portlet/Stylesheet.css); (4)
```

In which:

- (1) Skin of the portal page. The *UIPortalApplicationSkin.css* defines CSS classes shared by all the portal pages.
- (2) Skins of various portal-owned components, such as *WorkingWorkspace*, *MaskWorkspace*, *PortalForm*, and more.
- (3) Window decorator skins.
- (4) The portlet specification CSS classes. (The CSS styles defined in Portlet Specification JSR286)

To make a default skin flexible and highly reusable, instead of defining all CSS classes in this file, CSS classes are arranged in nested stylesheet files, based on the `@import` statement. This makes easier for new skins to reuse parts of the default skin. To reuse a CSS stylesheet from the default portal skin, you need to refer to the default skin from *eXoResources*. For example, to include the window decorators from the default skin within a new portal skin, you need to use the following import:

```
@import url(/eXoResources/skin/Portlet/Stylesheet.css);
```



Note

When the portal skin is added to the page, it merges all CSS stylesheets into a single file.

2.6.2. Override skins with extension

The extension mechanism of eXo Platform 3.5 enables the skin definition to be replaced with the skin resource configured in the extension-deployed web application. This is the example where the CSS path of default portal skin needs to be modified without touching the Platform's files.

```
<gatein-resources>
  <portal-skin>
    <skin-name>Default</skin-name>
    <css-path>/skin/Defaultskin/Stylesheet.css</css-path>
    <overwrite>false</overwrite>
    <css-priority>0</css-priority>
  </portal-skin>
</gatein-resources>
```

(The *css-path* specifies the stylesheet of the new skin.)

Override skins with extension

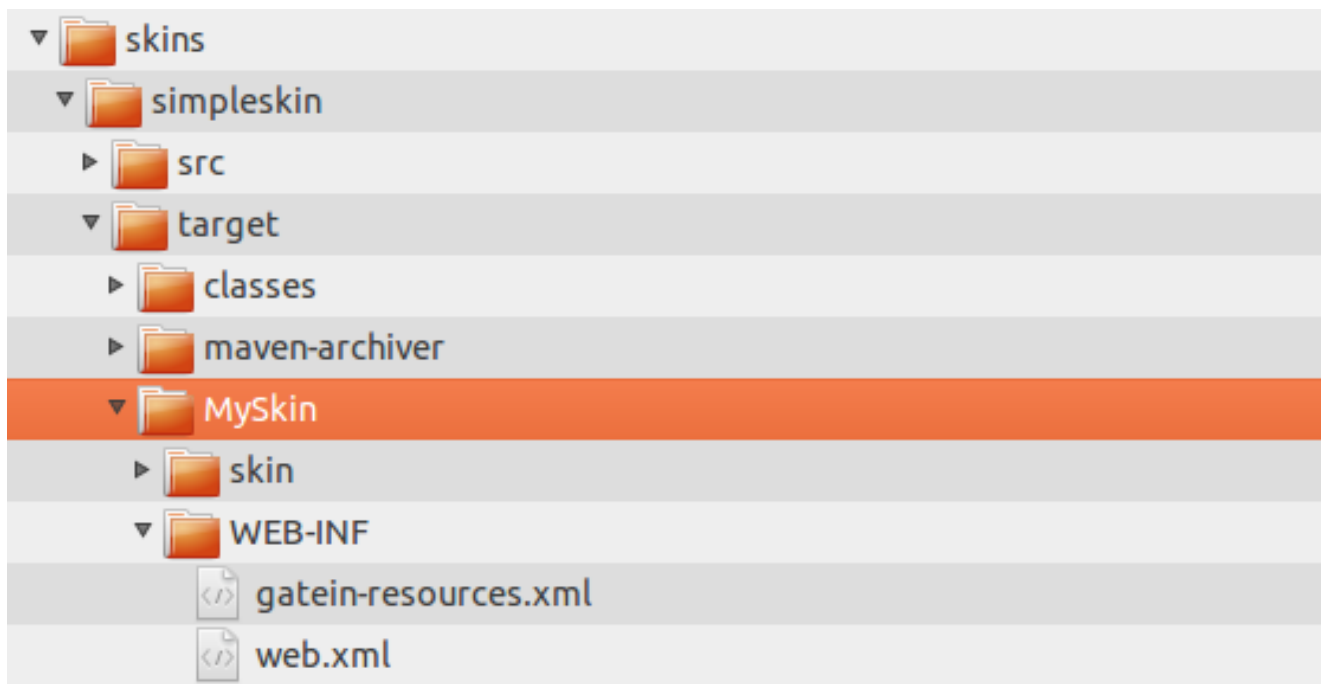
1. Create a web application whose *gatein-resources.xml* contains the same content as the above xml block, except the element `<css-path>` is modified.
2. Ensure that once the server has deployed the artifact, it does not load any web application with *gatein-resources.xml* configuring the same portal skin.

2.6.3. Create new skins

2.6.3.1. Create a new skin web archive

Create new portal skins

To create a new skin (called "MySkin"), you should create a new skin web archive with the following structure:



- The *web.xml* is the file that you will define the `ResourceRequestFilter`.
- The *gatein-resource.xml* will define your new skin (for portal, portlet or window style).
- The **skin** folder will contain images and stylesheets of your skin.

Configure portal skins

You need to specify the new portal skin in the *gatein-resources.xml* file. You also need to specify the name of new skin, where to locate its CSS stylesheet file and whether to overwrite the existing portal theme with the same name.

```

<gatein-resources>
  <portal-skin>
    <skin-name>MySkin</skin-name>
    <css-path>/skin/myskin.css</css-path>
    <overwrite>false</overwrite>
    <css-priority>0</css-priority>
  </portal-skin>
</gatein-resources>

```

The default portal skin and window styles are defined in the *eXoResources.war/WEB-INF/gatein-resources.xml* file.



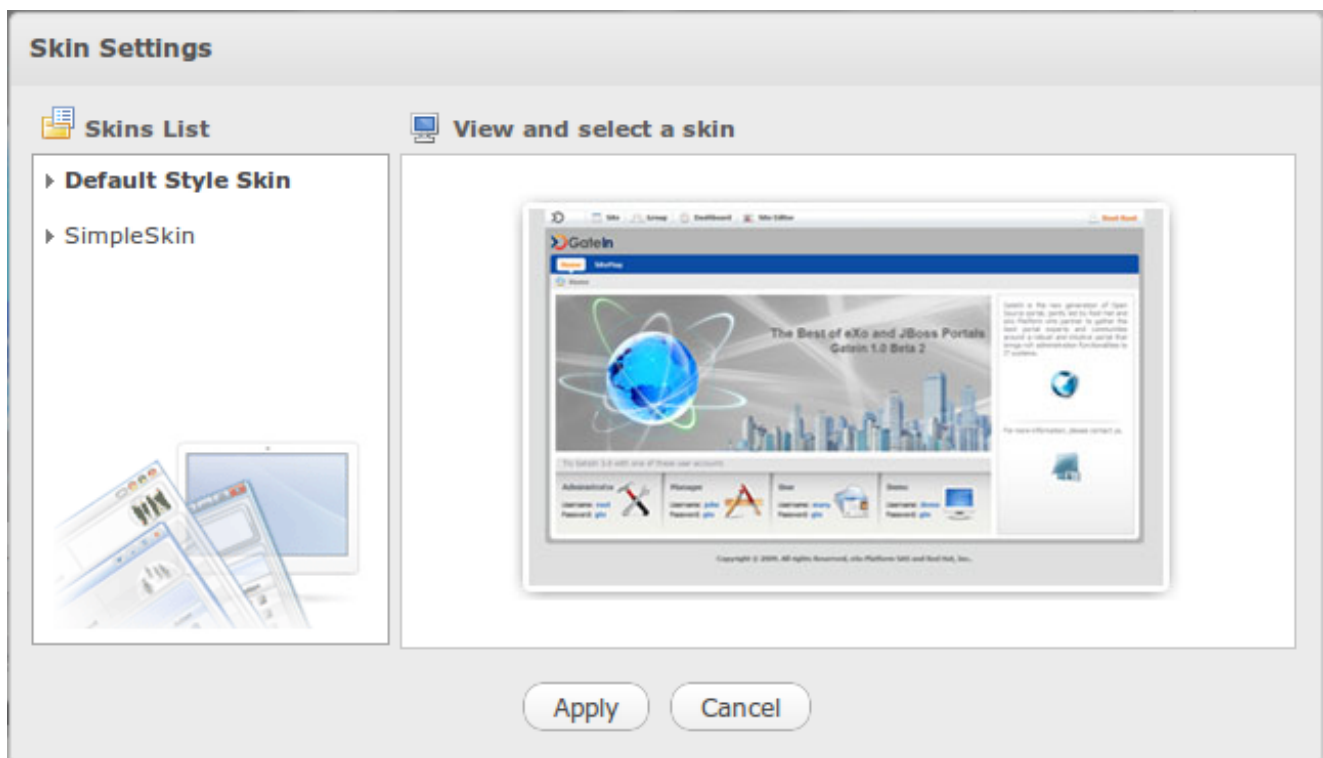
Note

The CSS for the portal skin needs to contain CSS for all window decorators and portlet specification CSS classes.

eXo Platform provides the "CSS priority" concept which controls the loading order of skins. The skin with lower "css-priority" value will be loaded first.

2.6.3.2. Create the skin preview icon

When selecting a skin it is possible to see a preview of what the skin will look like. The current skin needs to know about the skin icons for all the available skins, otherwise it will not be able to show the previews. When creating a new portal it is recommended to include the preview icons of the other skins and to update the other skins with your new portal skin preview.



For any portal skin, the paths to the preview images are specified in CSS class `UIChangeSkinForm`:

- `eXoResources/src/main/webapp/skin/DefaultSkin/portal/webui/component/customization/UIChangeSkinForm/Stylesheet.css`

For the portal named `MySkin`, it is required to define the following CSS classes:

```
.UIChangeSkinForm .UIItemSelector .TemplateContainer .MySkinImage
```

The default skin would be aware of skin icons if the preview screenshot is placed in:

- `eXoResources.war:/skin/DefaultSkin/portal/webui/component/customization/UIChangeSkinForm/background`.

The CSS stylesheet for the default portal needs to have the following updated with the preview icon CSS class. For the skin named `MySkin`, it is required to update the following:

- `eXoResources.war:/skin/DefaultSkin/portal/webui/component/customization/UIChangeSkinForm/Stylesheet.css`.

Now, amending the deployed package eXoResources is inevitable (modifying the default war/jar breaches development convention of Platform-based products). The problem would be resolved in future eXo Platform versions in which different skin modules are fully independent, for example, there will be no preview image duplication.

```
.UIChangeSkinForm .UIItemSelector .TemplateContainer .MySkinImage {
margin: auto;
width: 329px; height:204px;
background: url('background/MySkin.jpg') no-repeat top;
cursor: pointer ;
}
```

2.6.3.3. Skin the window style

Window style is the CSS applied to the window decorator. When the administrator selects a new application to add to a page, he can decide which style of decorator surrounding the window if any.

Configure window styles

Window style is defined within the *gatein-resources.xml* file used by the SkinService to deploy the window style. Window styles can belong to a window style category. This category and window styles need to be specified in the resources file. For example, the following *gatein-resource.xml* fragment will add MyThemeBlue and MyThemeRed to the MyTheme category.

```
<window-style>
<style-name>MyTheme</style-name>
<style-theme>
<theme-name>MyThemeBlue</theme-name>
</style-theme>
<style-theme>
<theme-name>MyThemeRed</theme-name>
</style-theme>
</window-style>
```

The windows style of the default skin is configured in the *eXoResources.war/WEB-INF/gatein-resources.xml* file.



Note

When a window style is defined in the *gatein-resources.xml* file, it will be available to all portlets regardless of whether the current portal skin supports the window decorator or not. When a new window decorator is added, it should be added to all portal skins or the portal skins should share a common stylesheet for window decorators.

Window style CSS

In order for the SkinService to display the window decorators, it must have CSS classes with the specific naming related to the window style name. The service will try and display CSS based on this naming. The CSS class must be included as part of the current portal skin for the window decorators to be displayed. The window decorator CSS classes for the default portal theme are located at *eXoResources.war/skin/PortletThemes/Stylesheet.css*.

Set the default window style

To set the default window style for a portal, you need to specify the CSS classes for a theme called DefaultTheme.

**Note**

You do not need to specify the DefaultTheme in the *gatein-resources.xml* file.

2.6.3.4. Configure the right-to-left skin

The SkinService handles stylesheet rewriting to accommodate the orientation. It works by appending *-lt* or *-rt* to the stylesheet name. For example, */web/skin/portal/webui/component/UIFooterPortlet/DefaultStylesheet-rt.css* will return the same stylesheet as */web/skin/portal/webui/component/UIFooterPortlet/DefaultStylesheet.css* but processed for the RT orientation. The *-lt* suffix is optional. Stylesheet authors can annotate their stylesheet to create content that depends on the orientation.

Example 1. This example uses the orientation to modify the float attribute that will make the horizontal tabs either float on left or on right:

```
float: left; /* orientation=lt */
float: right; /* orientation=rt */
font-weight: bold;
text-align: center;
white-space: nowrap;
```

The LT produced output will be:

```
float: left; /* orientation=lt */
font-weight: bold;
text-align: center;
white-space: nowrap;
```

The RT produced output will be:

```
float: right; /* orientation=rt */
font-weight: bold;
text-align: center;
white-space: nowrap;
```

Example 2. In this example, you need to modify the padding based on the orientation:

```
color: white;
line-height: 24px;
padding: 0px 5px 0px 0px; /* orientation=lt */
padding: 0px 0px 0px 5px; /* orientation=rt */
```

The LT produced output will be:

```
color: white;
line-height: 24px;
```

```
padding: 0px 5px 0px 0px; /* orientation=lt */
```

The RT produced output will be:

```
color: white;
line-height: 24px;
padding: 0px 0px 0px 5px; /* orientation=rt */
```

2.6.4. Skin the portlet

Portlets often require additional styles that may not be defined by the portal skin. eXo Platform 3.5 defines additional stylesheets for each portlet and will append the corresponding link tags to the head. The ID attribute of <link> element will be in the *portletAppName/PortletName* form. For example, the ContentPortlet in content.war takes "content/ContentPortlet" as ID. To define a new CSS file to be included whenever a portlet is available on a portal page, the following fragment needs to be added in the *gatein-resources.xml* file.

```
<portlet-skin>
  <application-name>portletAppName</application-name>
  <portlet-name>PortletName</portlet-name>
  <skin-name>Default</skin-name>
  <css-path>/skin/DefaultStylesheet.css</css-path>
</portlet-skin>
<portlet-skin>
  <application-name>portletAppName</application-name>
  <portlet-name>PortletName</portlet-name>
  <skin-name>OtherSkin</skin-name>
  <css-path>/skin/OtherSkinStylesheet.css</css-path>
</portlet-skin>
```

This action will load DefaultStylesheet.css or OtherSkinStylesheet.css when the DefaultSkin or OtherSkin is used respectively.



Note

If the current portal skin is not defined as part of the supported skins, the portlet CSS class will not be loaded. The portlet skins should be updated whenever a new portal skin is created.

Change portlet icons

Each portlet can be represented by a unique icon that you can see in the portlet registry or page editor. This icon can be changed by adding an image to the directory of portlet web application: *skin/DefaultSkin/portletIcons/icon_name.png*. The icon must be named after the portlet. For example, the icon of account portlet must be named AccountPortlet and located at: *skin/DefaultSkin/portletIcons/AccountPortlet.png*.



Note

You must use *skin/DefaultSkin/portletIcons/* for the directory to store the portlet icon regardless of using any skins.

2.6.5. Configure Platform skin

2.6.5.1. Select skins within the configuration files

The default skin can be set in the portal configuration files. The skin configured as default is used by Platform as the administrator starts/restarts the server.

Simply add a skin tag to the *portal.war/WEB-INF/conf/portal/portal/classic/portal.xml* configuration file.

To change skin to YourSkin, use the following code:

```
<portal-config>
  <portal-name>classic</portal-name>
  <locale>en</locale>
  <access-permissions>Everyone</access-permissions>
  <edit-permission>*/platform/administrators</edit-permission>
  <skin>MySkin</skin>
  ...
</portal-config>
```

2.6.5.2. Skins in the page markup

The eXo Platform 3.5 skin not only contains CSS styles for the portal's components, but also shares components that may be reused in portlets. When eXo Platform 3.5 generates the page markup of portal, stylesheet links will be inserted in the page's head tag. There are two main types of CSS links which appear in the head tag: one to the portal skin CSS file and the other to the portlet skin CSS file.

- **Portal Skin** appears as a single link to a CSS file. This link contains contents from all portal skin classes merged into one file. The portal skin will be transferred more quickly as a single file instead of multiple smaller files.
- **Portlet Skin** only appears as the link on the page if that portlet is loaded on the current page. A page may contain many CSS links of portlet skins or none.

In the code fragment below, you can see two types of links:

```
<head>
  ...
  <!-- The portal skin -->
  <link id="CoreSkin" rel="stylesheet" type="text/css" href="/eXoResources/skin/Stylesheet.css" />
  <!-- The portlet skins -->
  <link id="web_FooterPortlet" rel="stylesheet" type="text/css"
    href="/web/skin/portal/webui/
component/UIFooterPortlet/DefaultStylesheet.css" />
  <link id="web_NavigationPortlet" rel="stylesheet" type="text/css"
    href="/web/skin/portal/webui/
component/UINavigationPortlet/DefaultStylesheet.css" />
  <link id="web_HomePagePortlet" rel="stylesheet" type="text/css"
    href="/portal/templates/skin/
webui/component/UIHomePagePortlet/DefaultStylesheet.css" />
  <link id="web_BannerPortlet" rel="stylesheet" type="text/css"
    href="/web/skin/portal/webui/
component/UIBannerPortlet/DefaultStylesheet.css" />
  ...
</head>
```



Note

Window styles and portlet specification CSS classes are included within the portal skin.

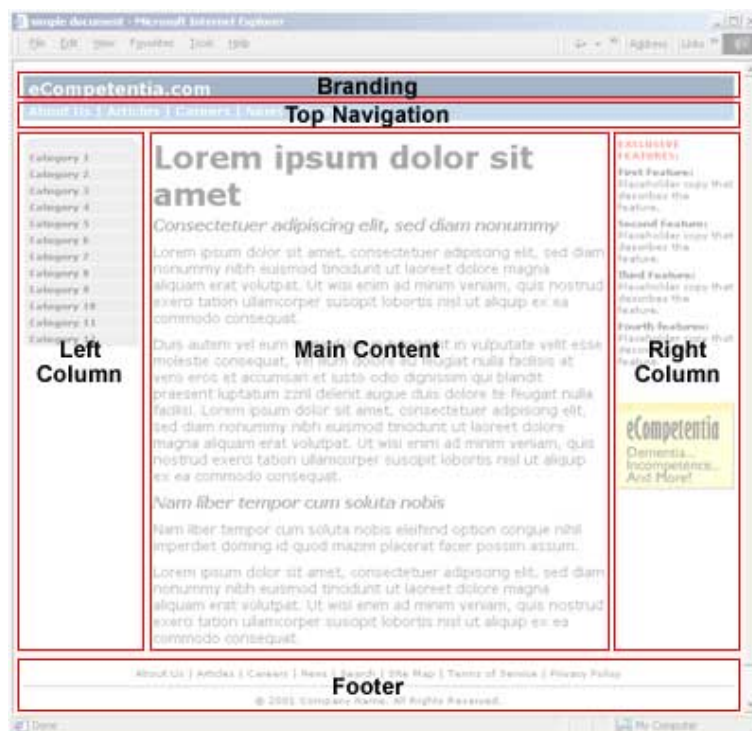
2.6.5.3. Customize portal's layout



Note

This section is related to the configuration. You can see a sample [here](#). You can leave all the portlet's preferences as blank, that means the default value will be taken and you do not need to care about it at this time.

For example, you will have a layout like this:



In which:

- Branding: A branding application
- Top navigation: A top navigation application

A table column container with three nested containers:

- Left Column and Right Column: Contain one application for each.
- Main content: Contain the page body.

And here is the fragment of *portal.xml* located in this path: `<myportal_path>/src/main/webapp/WEB-INF/conf/myportal/portal/portal/mysite/portal.xml`.

```
<!-- ... -->

<portlet-application>
  <!-- Branding application. You can use WCM web content *exo:webContent* for the content and SCV portlet to display -->
```

```

</portlet-application>

<portlet-application>
  <!-- navigation application. You can use WCM web content "exo:webContent" for the content and SCV portlet to display -->
</portlet-application>

<container id="MySite" template="system:/groovy/portal/webui/container/UITableColumnContainer.gtmpl">
  <container id="LeftColumn" template="system:/groovy/portal/webui/container/UIContainer.gtmpl">
    <!-- One or more application(s) here -->
    <portlet-application>
    </portlet-application>
  </container>

  <container template="system:/groovy/portal/webui/container/UIContainer.gtmpl">
    <page-body>
    </page-body>
  </container>

  <container id="RightColumn" template="system:/groovy/portal/webui/container/UIContainer.gtmpl">
    <!-- One or more application(s) here -->
    <portlet-application>
    </portlet-application>
  </container>
</container>

<portlet-application>
  <!-- Footer application. You can use WCM web content "exo:webContent" for the content and SCV portlet to display -->
</portlet-application>

<!-- ... -->

```

As you see in the *portal.xml* file above, every **container** tag has an **id** attribute, for example "**<container id = 'RightColumn'>**". When you create a CSS file, the property applied for this container should have the following name manner:

```

${container_id}TDContainer

```

and the details of this container:

```

RightColumnTDContainer

```

The reason is, when you have a look in the file system: */groovy/portal/webui/container/UITableColumnContainer.gtmpl* shown above, you will see this code fragment:

```

<table class="UITableColumnContainer"
  style="table-layout: fixed; margin: 0px auto;">
  <tr class="TRContainer">
    <% for(uiChild in uicomponent.getChildren()) {%>
    <td class="${uiChild.id}TDContainer TDContainer"><%
      uicomponent.renderUIComponent(uiChild) %></td> <% } %>
    </tr>
  </table>

```

So, in the **table** element (which represents the outer container), there are many **td** elements, each of which has the **class** attribute that equals to the **id** of the corresponding child component plus the "TDContainer" string literal.

2.6.5.4. Customize page's layouts



Note

This section is related to the configuration. You can see a sample [here](#). You can leave all the portlet's preferences as blank, that means the default value will be taken and you do not need to care about it at this time.

- Like *portal.xml*, you can define the layout for each page in your site as shown in the following example:



```
<!-- ... -->

<portlet-application> <!-- A custom document for content and SCV portlet to display -->
</portlet-application>

<portlet-application> <!-- A CLV portlet with a custom template. -->
</portlet-application>

<portlet-application> <!-- A CLV portlet with another custom template. -->
</portlet-application>

<!-- ... -->
```

2.6.5.5. Customize the Admin bar

This section shows you how to customize the **Admin** bar via the following topics:

- [sharedlayout.xml](#)
- [Remove a content from the Admin bar](#)
- [Add a content to the Admin bar](#)
- [Change the color scheme](#)

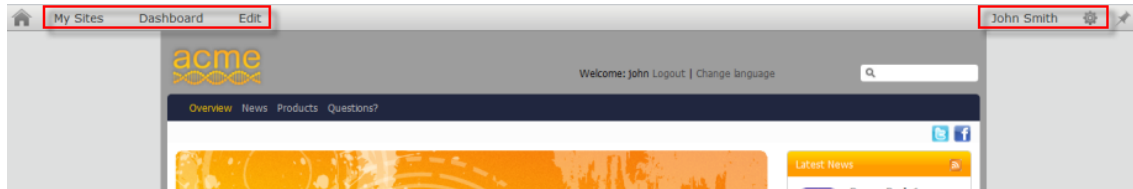
2.6.5.5.1. sharedlayout.xml

The **Admin** bar is a special container composed of portlets and defined in *WEB-INF/conf/portal/portal/sharedlayout.xml*.

If you want to redefine these portlets, you need to override this file by creating your own *sharedlayout.xml* located into your extension: *custom-extension.war!WEB-INF/conf/portal/portal/sharedlayout.xml*.

Followings are two examples of configuration, one to remove a portlet, the other to add a new portlet to the **Admin** bar.

2.6.5.5.2. Remove a content from the Admin bar



Portlets on the Admin bar

In the illustration above, each circle represents a portlet defined in the **Admin** bar and configured in *sharedlayout.xml*.

The *sharedlayout.xml* file configures the current displayed portlets on the **Admin** bar. For example, to remove the **Dashboard** menu, you will need to remove the following block:

```
...
<container id="UserToolBarDashboardPortlet" template="system:/groovy/portal/webui/container/UIContainer.gtmpl">
  <portlet-application>
    <portlet>
      <application-ref>exoadmin</application-ref>
      <portlet-ref>UserToolBarDashboardPortlet</portlet-ref>
    </portlet>
    <access-permissions>Everyone</access-permissions>
    <show-info-bar>false</show-info-bar>
  </portlet-application>
</container>
...
```

2.6.5.5.3. Add content to the Admin bar

Add a portlet to the Admin bar to logout user

In the same way you removed a portlet from the admin bar, you can add your own portlet by editing your *sharedlayout.xml*.

```
...
<container id="UILogoutPortlet" template="system:/groovy/portal/webui/container/UIContainer.gtmpl">
  <access-permissions>*:/platform/users</access-permissions>
  <portlet-application>
    <portlet>
      <application-ref>platformNavigation</application-ref>
      <portlet-ref>UILogoutPortlet</portlet-ref>
    </portlet>
    <access-permissions>*:/platform/users</access-permissions>
    <show-info-bar>false</show-info-bar>
  </portlet-application>
</container>
...
```

Style of portlet container can be changed by editing this css file:

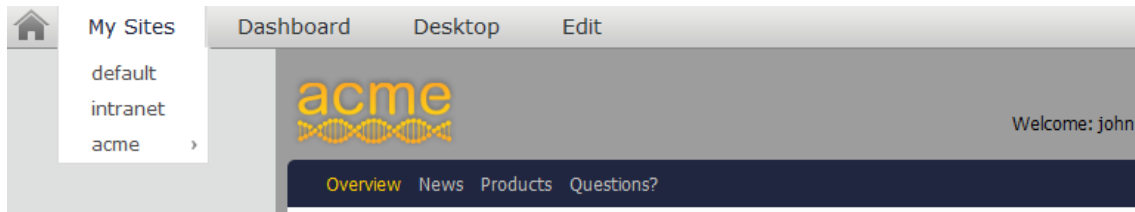
eXoResources/skin/DefaultSkin/portal/webui/component/view/UIToolBarContainer/Stylesheet.css

```
.UIToolbarContainer .UILogoutPortletTDContainer {
float: right; /* orientation=lt */
float: left; /* orientation=rt */
}
```

2.6.5.5.4. Change the color scheme

The current color of the **Admin** bar is gray gradient. However, you can change the color to match your brand colors.

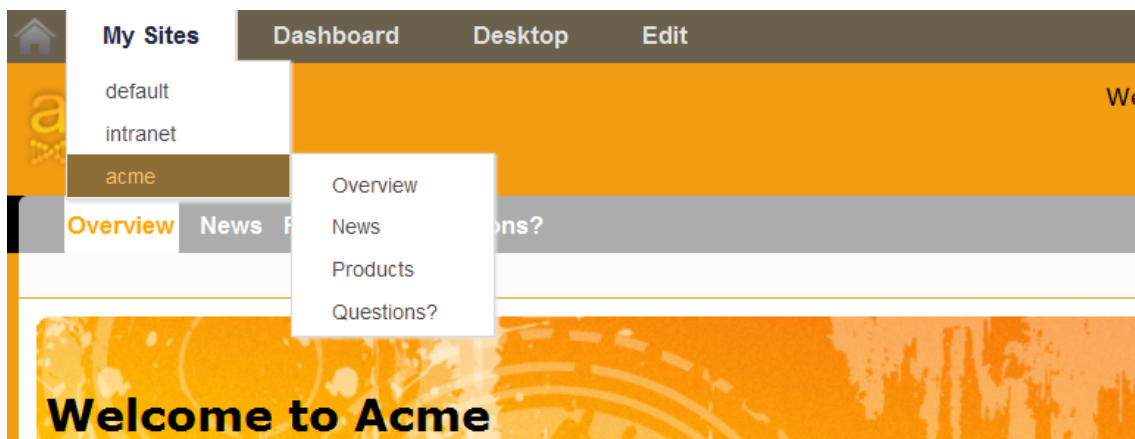
The default **Administration** style:



The style of the **Admin** bar is defined in the **stylesheet.css** located in *extension/resources/src/main/webapp/skin/platformSkin/UIToolbarContainer*.

Edit this CSS file to customize the **Admin** bar to your preferred color scheme.

The CSS code below shows how to modify the Admin bar to look like this:



```
.UIWorkingWorkspace #UIToolbarContainer .HomeLinkTDContainer {
line-height: 31px;
margin: 0px 5px;
vertical-align: middle;
}

.UIWorkingWorkspace .UIToolbarContainer .ToolbarContainer {
/*background: url(background/BgToolbarContainer.gif) repeat-x left top;*/
height: 31px;
border: none;
}

.UIWorkingWorkspace .UIToolbarContainer .ToolbarContainer .UITab .MenuItemContainer .MenuItem a {
padding: 0 22px 0 22px;
font-size: 12px!important;
color: #4c4c4c;
display: block;
font-weight: normal;
white-space: nowrap;
}

.UIToolbarContainer .ToolbarContainer .PinLink {
padding: 0px;
```

```

}

.UIWorkingWorkspace .UIToolbarContainer .ToolbarContainer a.TBIcon {
/*color: #2f3334;*/
font-weight: normal;
padding: 0 20px;
display: block;
white-space: nowrap;
background: none;
margin-left: 0;
zoom: 1;
font-size: 14px !important;
font-family: verdana;
border: 1px solid transparent;
border-bottom: none;
line-height: 29px;
height: 29px;
}

.UIWorkingWorkspace .UIToolbarContainer .ToolbarContainer a.SetupMenuItem {
padding: 0 8px;
line-height: 25px;
}

```

2.6.6. Configure skin in WCM

This tutorial will help you to create a new layout and skin, and give some best practices when creating a new layout and skin for your portal and page. Instructions described here are based on the following assumptions:

- You have an extension named "MyPortal", and you need to create a site called "MySite" inside this portal.
- The `<myportal_path>` below is replaced with the based path of your "MyPortal" extension.
- If you see any folder/file which does not exist, you should create a new one.

2.6.6.1. Customize CLV portlet's template



Note

This section is related to the configuration. You can see a sample [here](#).

- Apply your HTML/Groovy template code for this template.

For example:

`<myportal_path>/src/main/webapp/WEB-INF/conf/myportal/customized/template/list/ACustomizedCLVTemplate.gtmpl`

```

<div id="$uicomponent.id" class="ACustomizedCLVTemplate">
  <div class="ListContents">
    <!-- something here -->
  </div>
</div>

```

- Now, you need to import this template to the database.

`<myportal_path>/src/main/webapp/WEB-INF/conf/myportal/customized/template/configuration.xml`

```

<external-component-plugins>
  <target-component>org.exoplatform.services.cms.views.ApplicationTemplateManagerService</target-component>
  <component-plugin>

```

```

<name>ACustomizedCLVTemplate</name>
<set-method>addPlugin</set-method>
<type>org.exoplatform.services.cms.views.PortletTemplatePlugin</type>
<description>This is a sample customized CLV template</description>
<init-params>
  <value-param>
    <name>portletName</name>
    <value>Content List Viewer</value>
  </value-param>
  <value-param>
    <name>portlet.template.path</name>
    <value>war:/conf/myportal/customized/template</value>
  </value-param>
  <object-param>
    <name>default.folder.list.viewer</name>
    <description>Default folder list viewer groovy template</description>
    <object type="org.exoplatform.services.cms.views.PortletTemplatePlugin$PortletTemplateConfig">
      <field name="templateName">
        <string>ACustomizedCLVTemplate.gtmpl</string>
      </field>
      <field name="category">
        <string>list</string>
      </field>
    </object>
  </object-param>
</init-params>
</component-plugin>
</external-component-plugins>

```

2.6.6.2. Customize CLV template's style

1. Go to **Sites explorer** portlet --> **Sites management** drive --> **MySite/css** folder.
2. Create a new CSS document which contains your stylesheet for the portal and the page layout. You can use any name for this document and put a priority number.



Note

This document should contain ONLY one stylesheet for THIS template. If you have another template, you should create a new CSS document.

- The following is the sample stylesheet:

```

/* ... */
.ACustomizedCLVTemplate {
/* ... */

}

.ListContents {
/* ... */

}

/* ... */

```

3. Export the document and now you have an XML file.

Please check out [this tutorial](#) to know how to import this XML into the database.

2.6.7. Customize Document's skin



Note

This section is related to the configuration. You can see a sample [here](#).

First, you need to create a new document definition.

- `<myportal_path>/src/main/webapp/WEB-INF/conf/myportal/customized/document/ACustomizedDocument.xml`

```
node type name :exo:customizedDocument
properties: exo:name(type : String), exo:title(type : String), exo:content(type : String)
```

You also need to configure it to make sure it is imported to the database.

- `<myportal_path>/src/main/webapp/WEB-INF/conf/myportal/customized/document/definition-configuration.xml`

```
<external-component-plugins>
<target-component>org.exoplatform.services.jcr.RepositoryService</target-component>
<component-plugin>
  <name>ACustomizedDocument</name>
  <set-method>addPlugin</set-method>
  <type>org.exoplatform.services.jcr.impl.AddNodeTypePlugin</type>
  <priority>200</priority>
  <init-params>
    <values-param>
      <name>autoCreatedInNewRepository</name>
      <description>ACustomizedDocument document definition</description>
      <value>war:/conf/myportal/customized/document/ACustomizedDocument.xml</value>
    </values-param>
  </init-params>
</component-plugin>
</external-component-plugins>
```

Next, create the templates for this document, including:

- Dialog: see the sample [here](#).

`<myportal_path>/src/main/webapp/WEB-INF/conf/myportal/customized/document/dialog.gtmpl`

```
<div class="UIForm ACustomizedDocument">
  <% uiForm.begin() %>
  <!-- Document dialog content is here -->
  <% uiForm.end() %>
```

- View: see the sample [here](#).

`<myportal_path>/src/main/webapp/WEB-INF/conf/myportal/customized/document/view.gtmpl`

```
<style>
  <% _ctx.include(uiComponent.getTemplateSkin("exo:customizedDocument", "Stylesheet")); %>
</style>
```

```
<!-- Document view template content is here -->
```

- Stylesheet: see the sample [here](#).



Note

This document should contain ONLY the stylesheet for THIS template.

`<myportal_path>/src/main/webapp/WEB-INF/conf/myportal/customized/document/stylesheet.css`

```
/* ... */

.ACustomizedDocument {
/* ... */
}

/* ... */
```

- You also need to import them to the database.

`<myportal_path>/src/main/webapp/WEB-INF/conf/myportal/customized/document/template-configuration.xml`

```
<external-component-plugins>
<target-component>org.exoplatform.services.cms.templates.TemplateService</target-component>
<component-plugin>
  <name>addTemplates</name>
  <set-method>addTemplates</set-method>
  <type>org.exoplatform.services.cms.templates.impl.TemplatePlugin</type>
  <init-params>
    <value-param>
      <name>autoCreateInNewRepository</name>
      <value>true</value>
    </value-param>
    <value-param>
      <name>storedLocation</name>
      <value>war:/conf/myportal/customized/document</value>
    </value-param>
    <value-param>
      <name>repository</name>
      <value>repository</value>
    </value-param>
    <object-param>
      <name>template.configuration</name>
      <description>configuration for the location of nodetypes templates to inject in jcr</description>
      <object type="org.exoplatform.services.cms.templates.impl.TemplateConfig">
        <field name="nodeTypes">
          <collection type="java.util.ArrayList">
            <value>
              <object type="org.exoplatform.services.cms.templates.impl.TemplateConfig$NodeType">
                <field name="nodetypeName">
                  <string>exo:customizedDocument</string>
                </field>
                <field name="documentTemplate">
                  <boolean>true</boolean>
                </field>
                <field name="label">
                  <string>Customized Document</string>
                </field>
                <field name="referencedView">
                  <collection type="java.util.ArrayList">
                    <value>
                      <object type="org.exoplatform.services.cms.templates.impl.TemplateConfig$Template">
```

```

        <field name="templateFile">
            <string>view.gtmpl</string>
        </field>
        <field name="roles">
            <string>*</string>
        </field>
    </object>
</value>
</collection>
</field>
<field name="referencedDialog">
    <collection type="java.util.ArrayList">
        <value>
            <object type="org.exoplatform.services.cms.templates.impl.TemplateConfig$Template">
                <field name="templateFile">
                    <string>dialog.gtmpl</string>
                </field>
                <field name="roles">
                    <string>webdesigner./platform/web-contributors</string>
                </field>
            </object>
        </value>
    </collection>
</field>
<field name="referencedSkin">
    <collection type="java.util.ArrayList">
        <value>
            <object type="org.exoplatform.services.cms.templates.impl.TemplateConfig$Template">
                <field name="templateFile">
                    <string>stylesheet.css</string>
                </field>
                <field name="roles">
                    <string>*</string>
                </field>
            </object>
        </value>
    </collection>
</field>
</object>
</value>
</collection>
</field>
</object>
</value>
</collection>
</field>
</object>
</object-param>
</init-params>
</component-plugin>
</external-component-plugins>

```

Finally, you should create some initial contents and export them to XML files.

To import this XML into database, you can set up the deployment like this:

```

<external-component-plugins>
  <target-component>org.exoplatform.services.wcm.deployment.WCMContentInitializerService</target-component>
  <component-plugin>
    <name>Content Initializer Service</name>
    <set-method>addPlugin</set-method>
    <type>org.exoplatform.services.wcm.deployment.plugins.XMLDeploymentPlugin</type>
    <description>XML Deployment Plugin</description>
    <init-params>
      <object-param>
        <name>ACME Logo data</name>
        <description>Deployment Descriptor</description>
        <object type="org.exoplatform.services.deployment.DeploymentDescriptor">
          <field name="target">
            <object type="org.exoplatform.services.deployment.DeploymentDescriptor$Target">
              <field name="repository">
                <string>repository</string>
              </field>
              <field name="workspace">

```

```

        <string>collaboration</string>
      </field>
      <field name="nodePath">
        <string>/sites content/live/acme/web contents/site artifacts</string>
      </field>
    </object>
  </field>
  <field name="sourcePath">
    <string>war:/conf/wcm/artifacts/site-resources/acme/Logo.xml</string>
  </field>
</object>
</object-param>
</init-params>
</component-plugin>
</external-component-plugins>

```

2.6.8. Best practices to customize a skin

The skin folder structure must be prepared once you start the design. Follow these conventions and best practices to ease the integration of your design in eXo Platform.

Name files and folders

The id and class names are defined after the WebUI components name and portlets name with the 'UI-' as prefix. The same rule is applied for folder that contains components and portlets. It will help you find and edit correct files easily. For example, the UI portlet will be named as UIFooterPortlet, or UIBannerPortlet and the UI component will be named as UIToolbarContainer, or UIVerticalTab.

Folder structure

Portal skins

The portal skin will appear as a single link to a CSS file. This link will contain contents from all the portal skin classes merged into one file. This enables the portal skin to be transferred more quickly as a single file instead of many smaller files included with every page render.

- **The general folder structure for portal skin:**

```
/webapp/skin/NameOfPortalSkin/portal
```

For example:

```
/webapp/skin/DefaultSkin/portal
```

- **The main entry CSS file:**

The main entry CSS file should be placed right in the main portal skin folder. The file is the main entry point to the CSS class definitions for the skin:

```
/webapp/skin/NameOfPortalSkin/Stylesheet.css
```

For example:

```
/webapp/skin/SkinBlue/Stylesheet.css
```

- **The folder structure for WebUI components:**

```
/webapp/skin/SkinBlue/webui/component/YourUIComponentName
```

For example:

```
/webapp/skin/SkinBlue/webui/component/UIToolbarContainer
```

- **Window decorator CSS is put in:**

```
webapp/skin/PortletThemes/Stylesheet.css
```

- **Where to put images for portal skin?**

The images for portal skin should be put in the background folder right in the Portal skin folder and for each UI component.

For example:

```
/webapp/skin/SkinBlue/webui/component/UIProfileUser/SkinBlue/background
```

In summary, the folder structure for a new portal skin should be:

```
webapp
|- skin
|--- NameOfPortalSkin
|---- stylesheet.css
|----- webui
|----- component
|----- UIComponentName
|----- NameOfPortalSkin.css
|----- NameOfPortalSkin
|----- background
```

Portlet skin

Each portlet on a page may contribute its own style. The link to the portlet skin will only appear on the page if that portlet is loaded on the current page. A page may contain many portlet skin CSS links or none. The link ID will be named like {portletAppName}{PortletName}. For example, ContentPortlet in *content.war* will have the *id="contentContentPortlet"*.

General folder structure for portlet skin: */webapp/skin/portlet/webui/component/YourUIPortletName*

and for the Groovy skin: */webapp/groovy/portlet/webui/component/YourUIPortletName/*

For example:

- */webapp/skin/portlet/webui/component/UIBannerPortlet*
- */webapp/groovy/portlet/webui/component/UIBannerPortlet*

Portlet images folder: */webapp/skin/portlet/YourUIPortletName/PortalSkinName/background*

For example:

- */webapp/skin/portlet/UIBannerPortlet/BlueSkin/background*

Portlet themes

Main entry CSS:

- */webapp/skin/PortletThemes/Stylesheet.css*
- */webapp/skin/PortletThemes/background*
- */webapp/skin/PortletThemes/icons*

2.7. Add JavaScript to your portal

This can be done entirely within your extension by customizing the *gatein-resources.xml* configuration.

To add a JavaScript library, for example jQuery, create the *war:WEB-INF/gatein-resources.xml_* file.

```
<javascript>
<param>
```

```
<js-module>jQuery</js-module>
<js-path>/javascript/jQuery.js</js-path>
<js-priority>0</js-priority>
</param>
</javascript>
```

In which:

- `<js-module>` is the namespace of your JavaScript.
- `<js-path>` is the path to your JavaScript file.
- `<js-priority>` is an optional tag. This tag is used to indicate the loading order of JavaScript files across all eXo Platform. Its value is of the integer type. If its value is not negative (≥ 0), the loading priority is sorted by the descending order. If its value is negative (< 0), the loading priority of the JavaScript file depends on the loading order of the web app (.war file) containing the JavaScript file.

2.8. Create custom templates for pages

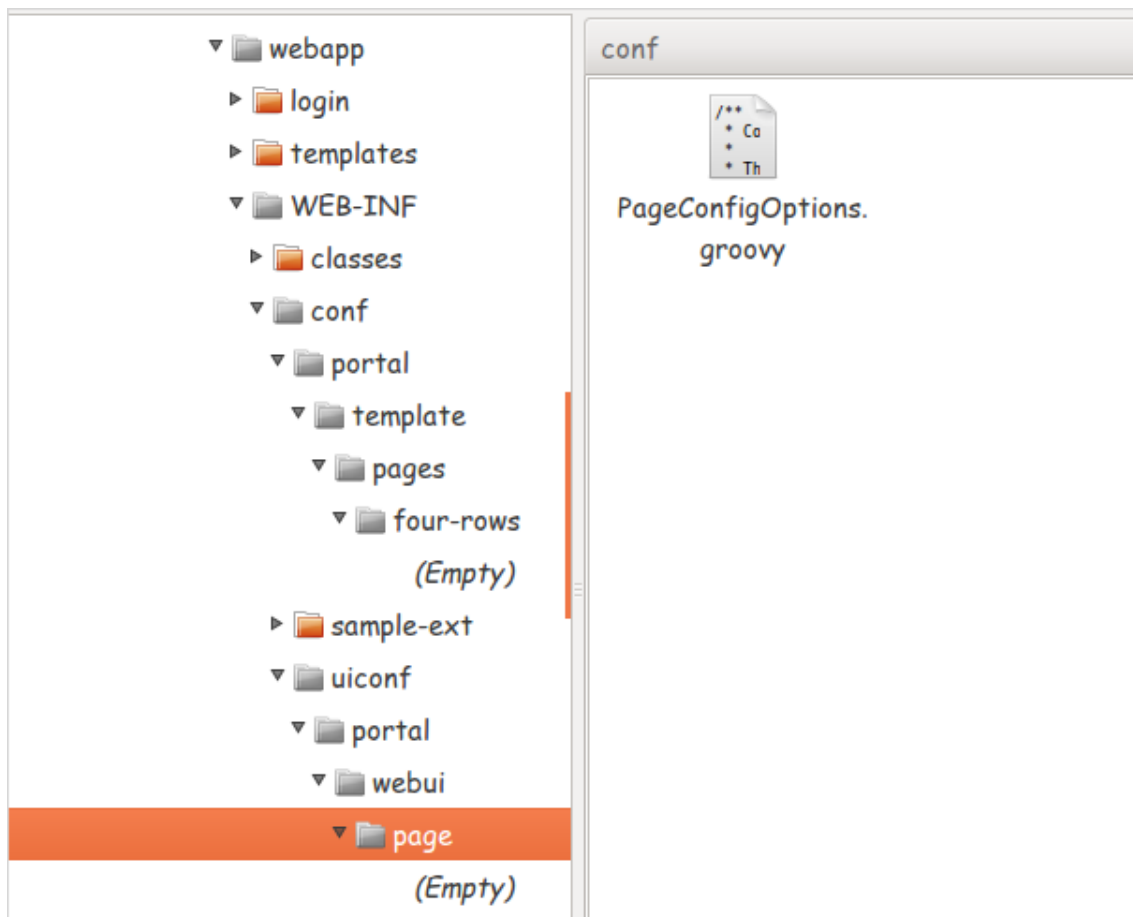
eXo Platform 3.5 provides you with some built-in templates when you create a new page via **Page Creation Wizard**. In this section, you will learn how to create a custom page template for **Page Creation Wizard**.

You should use the extension to add the page layout configuration. In this guide, you are going to work with the */examples/extension* project.

Create a custom page template

1. Add your sample template "FourRowsLayout" by overriding the *PageConfigOptions.groovy* file (portal.war).

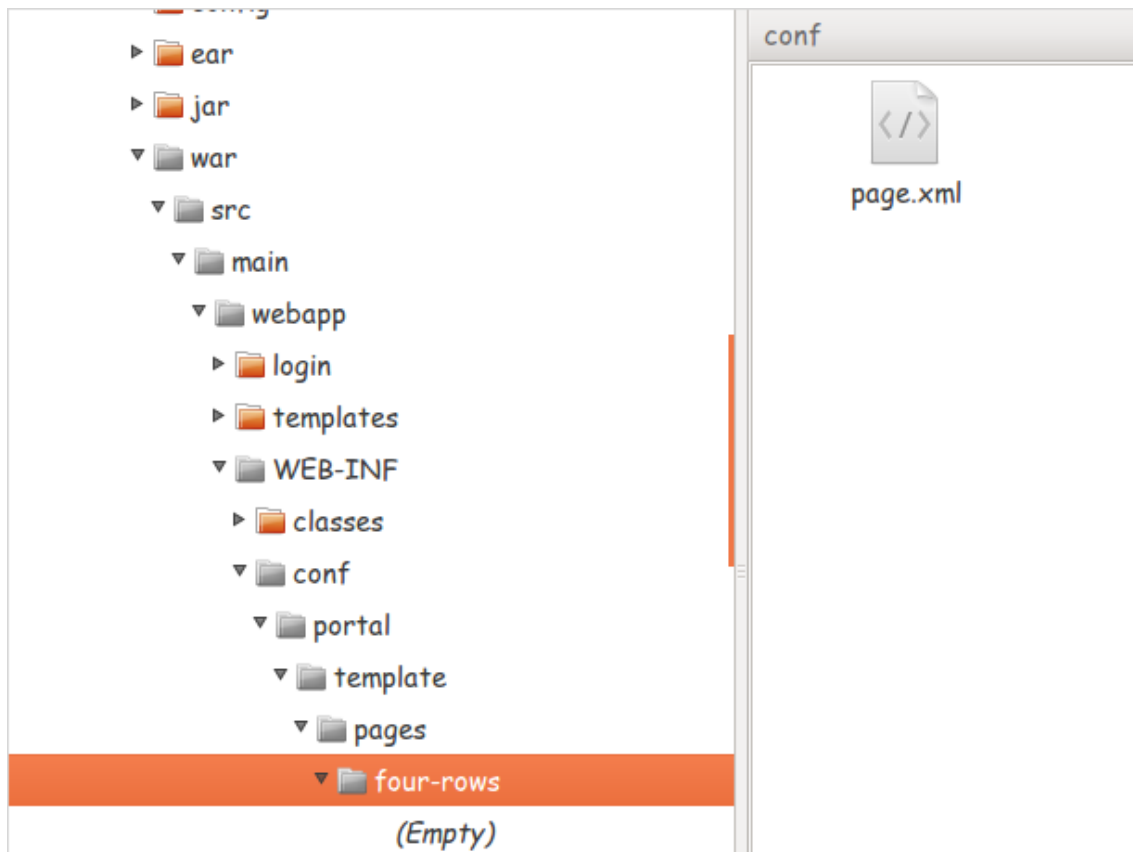
Add it to this path: */examples/extension/war/src/main/webapp/WEB-INF/conf/uiconf/portal/webui/page/PageConfigOptions.groovy*



Sample code:

```
...
SelectItemCategory samplePageConfigs = new SelectItemCategory("samplePageConfigs");
categories.add(samplePageConfigs);
samplePageConfigs.addSelectItemOption(new SelectItemOption("samplePage.FourRowsLayout", "four-rows", "FourRowsLayout:"));
...
```

2. Add your template file into the `/examples/extension/war/src/main/webapp/WEB-INF/conf/portal/template/pages/four-rows/page.xml` file.



Sample code:

```
<page
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.gatein.org/xml/ns/gatein_object_1_2.xsd http://gatein.org/xml/ns/gatein_object_1_2.xsd"
xmlns="http://gatein.org/xml/ns/gatein_object_1_2.xsd">
<name></name>
<container template="system:/groovy/portal/webui/container/UIContainer.gtmpl">
<access-permission>Everyone<access-permission>
</container>

<container template="system:/groovy/portal/webui/container/UIContainer.gtmpl">
<access-permission>Everyone<access-permission>
</container>

<container template="system:/groovy/portal/webui/container/UIContainer.gtmpl">
<access-permission>Everyone<access-permission>
</container>

<container template="system:/groovy/portal/webui/container/UIContainer.gtmpl">
<access-permission>Everyone<access-permission>
</container>
</page>
```

You can refer to the default template of eXo Platform in this path: `/web/portal/src/main/webapp/WEB-INF/conf/portal/template/pages`

3. Add the stylesheet to make the template preview image.

Add your own stylesheet in your extension webapp:

```
.UIItemSelector .<FourRowsLayout>{
```



```
width: 270px; height: 170px;  
margin: auto;  
background: url('background/ItemSelector.gif') no-repeat left -1700px;  
}
```

You can refer to the eXo Platform 3.5's default stylesheet in this path: */web/eXoResources/src/main/webapp/skin/DefaultSkin/webui/component/UISelector/UIItemSelector/Stylesheet.css*

4. Deploy your extension project. You will see the template and its preview image in the **Page Creation Wizard**.

Work With Content

This chapters represents issues related to creating a new content manually via the following topics:

- [Node type](#)
- [WCM template](#)
- [Document type](#)
- [Dialog Syntax](#)
- [Customize CKEditor](#)
- [Taxonomy](#)
- [Manage Template service](#)
- [Manage Navigation By Content](#)



Note

eXo Platform provides you with 2 options to create the content for your new extension:

- Create new content manually.
- Import an existing content into your extension.

3.1. Node type

To create a content for your extension, you first need to define a node type which represents the document type in the JCR. There are 2 ways to define your node type:

- Via the **Content Administration** portlet. For more details on how to create a note type via the **Content Administration** portlet, see the [Manage node types](#) in the eXo Platform 3.5 user guide.
- Via the .xml configuration files by creating a *nodetypes-configuration.xml* file in your extension as below.

```
<nodeType hasOrderableChildNodes="false" isMixin="true" name="exo:newnodetype" primaryItemName="">
  <supertypes>
    <supertype>exo:article</supertype>
  </supertypes>
  <propertyDefinitions>
    <propertyDefinition autoCreated="true" mandatory="true" multiple="false" name="text" onParentVersion="COPY" protected="false" requiredType="String">
      <valueConstraints/>
    </propertyDefinition>
    <propertyDefinition autoCreated="false" mandatory="true" multiple="false" name="date" onParentVersion="COPY" protected="false" requiredType="Date">
      <valueConstraints/>
    </propertyDefinition>
  </propertyDefinitions>
</nodeType>
```

By defining a supertype, you can reuse other node types and extend them with more properties (just like inheritance in Object Oriented Programming).

3.2. WCM template

After defining your node type, you need to select templates which are applied to a node type or a metadata mixin type. eXo Platform provides 2 types of WCM templates, including:

- **dialogs** which are HTML forms for creating node instances.
- **views** which are HTML fragments for displaying nodes.

From the **Content Administration** portlet, the **Manage Template** module lists all existing node types that have been associated with **Dialog** and/or **View** templates. These templates can be attached to permissions (in the usual *membership:group* form), so which specific templates are displayed according to user rights (which can be useful in a content validation workflow activity).

In eXo Platform, you can specify whether JavaScript is allowed to run on a field of the content template or not by using the *"option"* parameter.

Enable JavaScript

1. Go to **Content Administration --> Content Presentation --> Manage Templates**.
2. Edit your desired template.
3. Select the **Dialog** tab, and then edit the content of *Dialog1* in the **View & Edit Template** form.
4. Add *option = noSanitization* to the code in the **Main** field as the example below.

For example:

```
String [] htmlArguments = ["jcrPath = / node / default.html / JCR: content / JCR: data", "options = toolbar: CompleteWCM, height: '410px ', noSanitization" htmlContent];
```

By default, JavaScript is disabled for any fields of some content templates to prevent the XSS attacks.

3.3. Document type

The **Document Type** checkbox is to define if the node type should be a **Document Type** or not. If this checkbox is selected, the **Sites Explorer** considers such nodes as user content and applies the following behavior:

- The **View** template will be used to display the **DocumentType** nodes.
- The document types nodes can be created by the **Add Content** action. The forms shown in the **Add Document** action are the corresponding **Dialog** templates of each document type.
- Non-document types are hidden unless the **Show Non-document Nodes** option is checked.

Templates are written using Groovy Templates and will require experiences with JCR API and HTML notions.

3.4. Dialog Syntax

Dialogs are Groovy Templates that generate forms by mixing static HTML fragments and Groovy calls to the components responsible for building the UI at runtime. As a result, you will get a simple but powerful syntax.

3.4.1. Interceptors

By placing interceptors in your template, you will be able to execute a Groovy script just before and just after saving the node. Pre-save interceptors are mostly used to validate input values and their overall meaning while the post-save interceptor can

be used to do some manipulations or references for the newly created node, such as binding it with a forum discussion or wiki space.

To place interceptors, use the following fragment:

```
<% uicomponent.addInterceptor("ecm-explorer/interceptor/PreNodeSaveInterceptor.groovy", "prev");%>
```

Interceptor Groovy scripts are managed in the 'Manage Script' section in the ECM admin portlet. They must implement the `CmsScript` interface. Pre-save interceptors obtain input values within the context:

```
public class PreNodeSaveInterceptor implements CmsScript {

    public PreNodeSaveInterceptor() {
    }

    public void execute(Object context) {
        Map inputValues = (Map) context;
        Set keys = inputValues.keySet();
        for(String key : keys) {
            JcrInputProperty prop = (JcrInputProperty) inputValues.get(key);
            println(" --> "+prop.getJcrPath());
        }
    }

    public void setParams(String[] params) {
    }

}
```

Whereas the post-save interceptor is passed the path of the saved node in the context:

```
<% uicomponent.addInterceptor("ecm-explorer/interceptor/PostNodeSaveInterceptor.groovy", "post");%>

public class PostNodeSaveInterceptor implements CmsScript {

    public PostNodeSaveInterceptor() {
    }

    public void execute(Object context) {
        String path = (String) context;

        println("Post node save interceptor, created node: "+path);
    }

    public void setParams(String[] params) {
    }

}
```

3.4.2. Hidden fields

In the next code sample, each argument is composed of a set of keys and values. The order of arguments are not important and only the key matters. That example defines a field with the id as "hiddenField2", which will generate a hidden field. The value of this field will be automatically set to UTF-8 and no visible field will be printed on the form.

```
String[] hiddenField2 = [{"jcrPath=/node/jcr:content/jcr:encoding", "visible=false", "UTF-8"}];
```

```
uicomponent.addHiddenField("hiddenInput2", hiddenField2);
```

Once the form has been saved, the date value will be saved under the relative JCR path `./exo:image/jcr:lastModified`.

3.4.2.1. Non-value field

You cannot either see the non-value field on the form or input value for them. Its value will be automatically created or defined when you are managing templates.

```
String[] hiddenField1 = [{"jcrPath=/node/jcr:content", "nodetype=nt:resource", "mixintype=dc:elementSet", "visible=false"}];
uicomponent.addHiddenField("hiddenInput1", hiddenField1);
```

3.4.2.2. Non-editable fields

It is possible to create widgets that are non-editable (and then only used to print some information).

```
String[] fieldCategories = [{"jcrPath=/node/exo:category", "multiValues=true", "reference=true", "editable=false"}]; uicomponent.addTextField("categories",
fieldCategories);
```

3.4.2.3. Create node type or mixin type

In many cases, when creating an instance where the node is out of form, you must still specify the CMS service about the node structure. Particularly, you must define if which node type is child of the newly created node or if the current node has any mixin type attributed.

By defining these arguments, the node and its children are created with the correct node type and mixin type.

See the following example:

```
String[] hiddenField = [{"jcrPath=/node/jcr:content", "nodetype=nt:resource", "mixintype=exo:rss-enable", "visible=false"}];
uicomponent.addHiddenField("hiddenInput", hiddenField);
```

3.4.2.4. Hidden field with default value

In the previous sample, the value was automatically created and set according to the current date. However, it is also possible to set a default value for a field.

```
String[] hiddenField = [{"jcrPath=/node/jcr:content/jcr:mimeType", "image/jpeg"}];
uicomponent.addHiddenField("hiddenInput", hiddenField);
```

3.4.2.5. Visible without null fields

It is possible to tell that a widget should be visible only if its value is not null or when the form is used to edit the node which has been existing.

```
String nameArgs[] = [{"jcrPath=/node", "mixintype=mix:votable", "visible=if-not-null"}];
```

```
uicomponent.addMixinField("name", nameArgs )
```

3.4.2.6. WYSIWYG widget

Widgets are natively part of the eXo Platform product to provide a simple and easy way for users to get information and notification on their application. They complete the portlet application that focuses on more transactional behaviors.

WYSIWYG stands for What You See Is What You Get. This widget is one of the most powerful tools. It renders an advanced JavaScript text editor with many functionalities, including the ability to dynamically upload images or flash assets into a JCR workspace and then to refer to them from the created HTML text.

```
String[] fieldSummary = [{"jcrPath=/node/exo:summary", "options=basic"}];
uicomponent.addWYSIWYGField("summary", fieldSummary);
```

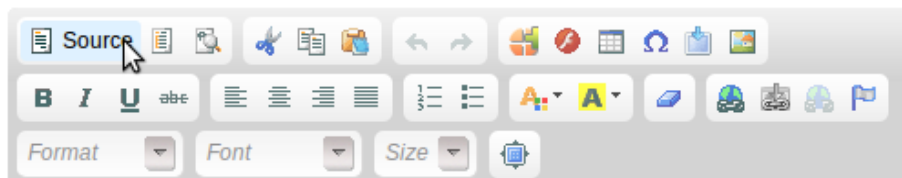
```
String[] fieldContent = [{"jcrPath=/node/exo:text", "options=toolbar:CompleteWCM,height:410px", ""}];
uicomponent.addRichTextField("content", fieldContent)
```

The "options" argument is used to tell the component which toolbar should be used.

By default, there are five options for the toolbar: CompleteWCM, Default, BasicWCM, Basic, SuperBasicWCM.

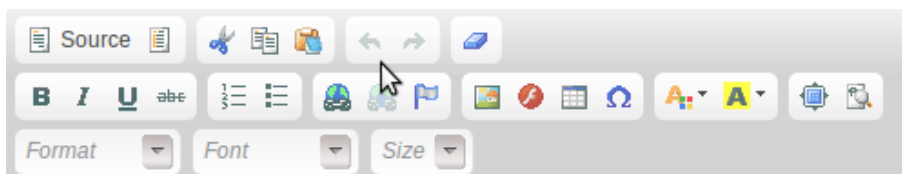
- CompleteWCM: a full set of tools is shown.

The following buttons are shown: Source, Templates, Show Blocks, Cut, Copy, Paste Text, Undo, Redo, SpellCheck, WCM Insert Gadget, Flash, Table, Insert Special Character, WCM Insert Content Link, Bold, Italic, Underline, Strike Through, Justify Left, Justify Center, Justify Right, Justify Full, Ordered List, Unordered List, Text Color, Background Color, Remove Format, Link, WCM Insert Portal Link, Unlink, Anchor, Style, Font Format, Font Name, Font Size, Maximize.



- Default: a large set of tools is shown, no "options" argument is needed in that case.

The following buttons are shown: Source, Templates, Cut, Copy, PasteText, Undo, Redo, SpellCheck, RemoveFormat, Bold, Italic, Underline, Strike Through, Ordered List, Unordered List, Link, Unlink, Anchor, Image, Flash, Table, Special Character, Text Color, Background Color, Show Blocks, Style, Font Format, Font Name, Font Size, Maximize.



- BasicWCM: a minimal set of tools is shown.

The following buttons are shown: Source, Bold, Italic, Underline, Strike Through, OrderedList, UnorderedList, Outdent, Indent, Justify Left, Justify Center, Justify Right, JustifyFull, Blockquote, Link, Unlink, WCM Insert Portal Link, WCM Insert Content Link, Show Blocks, Style, Font Format, Font Name, FontSize, Maximize.



- Basic:

The following buttons are shown: Source, Bold, Italic, Underline, Strike Through, Ordered List, Unordered List, Outdent, Indent, Justify Left, Justify Center, Justify Right, Justify Full, Blockquote, Link, Unlink, Show Blocks, Style, Font Format, Font Name, Font Size, Maximize.



- SuperBasicWCM:

The following buttons are shown: Source, Bold, Italic, Underline, Justify Left, Justify Center, Justify Right, Justify Full, Link, Unlink, WCM Insert Portal Link, WCM Insert Gadget, WCM Insert Content Link.



There is also a simple text area widget, which has text-input area only:

```
String [] descriptionArgs = [{"jcrPath=/node/exo:title", "validate=empty"};
uicomponent.addTextAreaField("description", descriptionArgs);
```

3.4.2.7. Create a custom RichText editor fields

In the [WYSIWYG widget](#) section, you already know about a set of default toolbars (CompleteWCM, Default, BasicWCM, Basic, SuperBasicWCM). In this section, you will learn how to create a **RichText** editor with custom buttons.

Just edit the configuration file and modify or add new items to the configuration file of the **RichText** editor is located in: *apps/resource-static/src/main/Webapp/eXoConfig.js*

Take a look at the eXoConfig.js file to see a definition of a custom toolbar named "MyCustomToolbar":

```
FCKConfig.ToolbarSets["MyCustomToolbar"] = [
  ['Source','Templates','-','FitWindow','ShowBlocks'],
  ['Cut','Copy','PasteText','-','SpellCheck','-','Undo','Redo'],
  ['WCMInsertGadget','Flash','Table','SpecialChar','WCMInsertContent'],
  '/',
  ['Bold','Italic','Underline','StrikeThrough','-','JustifyLeft','JustifyCenter','JustifyRight','JustifyFull','-','OrderedList','UnorderedList','-','TextColor','BGColor','-','RemoveFormat'],
  ['Link','WCMInsertPortalLink','Unlink','Anchor'],
  '/',
  ['Style','FontFormat','FontName','FontSize']
];
```

Every toolbar set is composed of a series of "toolbar bands" that are grouped in the final toolbar layout. The bands items move together on new rows when resizing the editor.

Every toolbar band is defined as a separated JavaScript array of strings. Each string corresponds to an available toolbar item defined in the editor code or in a plugin.

- Put the desired button names in square bracket ("[" & "]") and separate them by commas to create a toolbar band. You can look at the above code to know all the possible toolbar item. If the toolbar item does not exist, a message will be displayed when loading the editor.
- Include a separator in the toolbar band by putting the "-" string on it.
- Separate each toolbar brands with commas.
- Use slash ("/") to tell the editor that you want to force the next bands to be rendered in a new row and not following the previous one.



Note

The last toolbar band must have no comma after it.

3.4.2.8. Simple select box widget

The select box widget enables you to render a select box with static values. These values are enumerated in a comma-separated list in the "options" argument. The argument with no key (here "text/html") is selected by default.

```
String[] mimetype = [{"jcrPath=/node/jcrcontent/jcr:mimeType", "text/html", "options=text/html,text/plain"} ;
uicomponent.addSelectBoxField("mimetype", mimetype) ;
```

As usual, the value will be stored at the relative path defined by the jcrPath directive argument.

For more examples on how to create WCM templates, refer to the [WCM Templates](#) section.

3.4.2.9. Advanced dynamic select box

In many cases, the previous solution with static options is not good enough and one would like to have the select box checked dynamically. That is what eXo Platform provide thanks to the introduction of a Groovy script as shown in the code fragment below.

```
String[] args = [{"jcrPath=/node/exodestWorkspace", "script=ecm-explorer/widget/FillSelectBoxWithWorkspaces:groovy", "scriptParams=production"};
uicomponent.addSelectBoxField("destWorkspace", args) ;
```

The script itself implements the CMS Script interface and the cast is done to get the select box object as shown in the script code which fills the select box with the existing JCR workspaces.

```
import java.util.List ;
import java.util.ArrayList ;

import org.exoplatform.services.jcr.RepositoryService;
import org.exoplatform.services.jcr.core.ManageableRepository;

import org.exoplatform.webui.form.UIFormSelectBox;
import org.exoplatform.webui.core.model.SelectItemOption;
import org.exoplatform.services.cms.scripts.CmsScript;

public class FillSelectBoxWithWorkspaces implements CmsScript {

    private RepositoryService repositoryService_;

    public FillSelectBoxWithWorkspaces(RepositoryService repositoryService) {
```

```

    repositoryService__ = repositoryService;
}

public void execute(Object context) {
    UIFormSelectBox selectBox = (UIFormSelectBox) context;

    ManageableRepository jcrRepository = repositoryService__.getRepository();
    List options = new ArrayList();
    String[] workspaceNames = jcrRepository.getWorkspaceNames();
    for(name in workspaceNames) {
        options.add(new SelectItem(name, name));
    }
    selectBox.setOptions(options);
}

public void setParams(String[] params) {
}
}

```



Note

It is also possible to provide a parameter to the script by using the argument "scriptParams".

3.4.2.10. Widget with selector

One of the most advanced functionalities of this syntax is the ability to plug your own component that shows an interface, enabling you to select the value of the field.

In the generated form, you will see an icon which is configurable thanks to the selectorIcon argument. The syntax is a bit more complex but not much.

```

String[] groupArgs = [{"jcrPath=/node/exogroup", "selectorClass=org:exoplatform.ecm.webui.selector:UIGroupMemberSelector"}];
uicomponent.addActionField("group", groupArgs);

```

You can plug your own component using the selectorClass argument. It must follow the eXo UIComponent mechanism and implements the interface ComponentSelector:

```

package org.exoplatform.ecm.webui.selector;

import org.exoplatform.webui.core.UIComponent;
public interface ComponentSelector {
    public UIComponent getSourceComponent() ;
    public void setSourceComponent(UIComponent uicomponent, String[] initParams) ;
}

```

3.4.2.11. Multi-valued widget

A widget can have multiple values if you add the argument "multiValues=true" to the directive.

3.5. Customize CKEditor

CKEditor is a text editor. This is a WYSIWYG editor which allows you to see what the published results look like while editing your text. It brings to the common web-editing features found on desktop-editing applications like Microsoft Word, and OpenOffice. To have more information about a WYSIWYG editor, see the [WYSIWYG widget](#) section.

3.5.1. Installation

You can install CKEditor easily by selecting an appropriate procedure (fresh installation or upgrade) and follow the steps described below.

3.5.1.1. Fresh Installation

This way is used to install CKEditor for the first time.

1. Download the latest version of the editor [here](#).
2. Extract (decompress) the downloaded archive to a directory called *ckeditor* in the root of your website.



Note

You can place the files in any path of your website. The *ckeditor* directory is the default one.

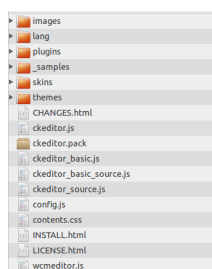
3.5.1.2. Upgrade

To upgrade an existing CKEditor installation, do as follows:

1. Rename your old editor folder to a backup folder, for example, "ckeditor_old".
2. Download the latest version of the editor [here](#).
3. Extract/Decompress the downloaded archive to the original editor directory, for example, "ckeditor".
4. Copy all configuration files that you have changed from the backup folder to their corresponding positions in the new directory. These files could include (but not limited to) the following files:
 - config.js
 - contents.css
 - plugins/templates/templates/default.js
 - plugins/styles/styles/default.js
 - plugins/pastefromword/filter/default.js

3.5.2. File and Folder Structure

3.5.2.1. Inside CKEditor



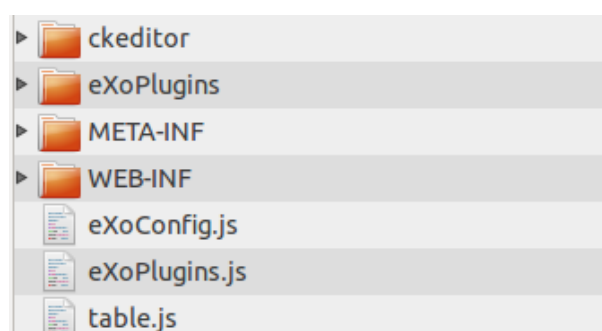
There are the following folders:

Folders	Description
samples	Contain CKEditor samples.
source	Contain CKEditor source code.
adapters	Contain CKEditor adapters. It may be removed if you do not use any adapters, like the jQuery one.
images	Contain CKEditor graphics files.
lang	Contain CKEditor language files.
plugins	Contain plugin files and is necessary for CKEditor to work.
skins	Contain CKEditor skin files along with toolbar buttons and stylesheet definitions.
themes	Contains CKEditor theme.

Files	Description
ckeditor.js	The heart of CKEditor application. It is the unique compressed file which contains all of codes to run CKEditor.
ckeditorbasic.js	The compressed file like <i>ckeditor.js</i> , but it is only a bootstrap which contains the core functionality only, so the rest of the code can be loaded at later time, avoiding delaying the initial load of the page.
ckeditorsource.js	An uncompressed version of <i>ckeditor.js</i> .
ckeditorbasicsource.js	An uncompressed version of <i>ckeditorbasic.js</i> .
config.js	Allow users to customize some configurations.
contents.css	Define the stylesheets of the CKEditor application.
ckeditor.asp	Used for ASP integration.
ckeditor.php	Used for PHP integration.
ckeditorphp4.php	Used for PHP4 integration.
ckeditorphp5.php	Used for PHP5 integration.
ckeditor.pack	Re-build the compression version of 2 files: <i>ckeditor.js</i> , and <i>ckeditorbasic.js</i> .

3.5.2.2. CKEditor in Context of eXo Platform

There is a *.war* package named *eXoStaticResources* which integrates the CKEditor application into eXo Platform. The source code is placed inside the *apps/resources-static/src/main/webapp* folder.



Its structure consists of the folders and files below:

Folders & Files	Description
ckeditor	Contain all source codes of CKEditor v3.3.2.
eXoPlugins	Contain the source code of 3 external plugins: {}Insert Content Link{}, {}Insert Portal Link{}, {}WCM Insert Gadget{}.
eXoConfig.js	Register 3 external plugins, and define some types of the toolbar.
eXoPlugins.js	Define some utility functions which can be used by 3 external plugins.

3.5.3. Configuration in CKEditor

3.5.3.1. Setting Configuration

CKEditor comes with a rich set of configuration options that make it possible to customize its appearance, features, and behavior. The main configuration file is named *config.js*. This file can be found in the root of the CKEditor installation folder (*/webapps/eXoStaticResources/ckeditor/config.js*). By default, this file is mostly empty. To change the CKEditor configuration, add the settings that you want to modify to the *config.js* file.

For example:

```
CKEDITOR.editorConfig = function( config )
{
    config.language = 'en';
    config.uiColor = '#AADC6E';
};
```

Instead of using the default *config.js* file, you can create a copy of that file in anywhere in your website and simply point the editor instances to load it. For example, in eXo Platform, the configuration file for CKEditor is placed at */webapps/eXoStaticResources/eXoConfig.js*, so the content of the *config.js* file will be:

```
CKEDITOR.editorConfig = function( config )
{
    config.customConfig = "../eXoConfig.js";
};
```

3.5.3.2. Skin

You can change the CKEditor skin by adjusting a single configuration option. In eXo Platform, to change the CKEditor skin, do as follows:

1. Open the */webapps/eXoStaticResources/eXoConfig.js* configuration file of CKEditor.
2. Set up a skin for CKEditor. It may be the name of the skin folder inside the editor installation path, or the name and the path separated by a comma.

```
config.skin = 'v2';
config.skin = 'myskin,/customstuff/myskin/';
```

By default, CKEditor has 3 skins for users to select: **v2**, **kama**, and **office2003**. They are placed in the `/webapps/eXoStaticResources/ckeditor/skins` folder.

3.5.3.3. Toolbar

Toolbar Definition

CKEditor is a full-featured WYSIWYG editor, but not all of its options are needed in all cases. Therefore, the toolbar customization is one of the most common and required tasks when dealing with CKEditor.

Toolbar Definition is a JavaScript array which contains the elements to be displayed in all toolbar rows available in the editor. In eXo Platform, the toolbar definition is placed in the `/webapps/eXoStaticResources/eXoConfig.js` file. The following code snippet contains the default CKEditor toolbar set in eXo Platform.

```
config.toolbar_Default = [
  ['Source','Templates'],
  ['Cut','Copy','PasteText','-','SpellCheck'],
  ['Undo','Redo','-','RemoveFormat'],
  '/',
  ['Bold','Italic','Underline','Strike'],
  ['NumberedList','BulletedList'],
  ['Link','Unlink','Anchor'],
  ['Image','Flash','Table','SpecialChar'],
  ['TextColor','BGColor'],
  ['Maximize','ShowBlocks'],
  ['Style','Format','Font','FontSize']
];
```

Add a new toolbar in eXo Platform

- To add a new toolbar in eXo Platform, open the `/webapps/eXoStaticResources/eXoConfig.js` configuration file of CKEditor, then add the following code snippet to it.

```
config.toolbar_MyToolbar =
[
  ['Bold', 'Italic', '-', 'NumberedList', 'BulletedList', '-', 'Link', 'Unlink','-','About']
];
```

Show the newly added toolbar

To show the newly added toolbar, you have to add it to a field of a WCM template. For example, to show the new toolbar on the content field of HTML file, you need to modify the dialog template of HTML file as follows:

```
String[] fieldSummary = [{"jcrPath=/node/jcr:content/jcr:data", "", "options=toolbar:MyToolbar, noSanitization"}];
uicomponent.addRichTextField("contentHtml", fieldSummary);
```

By adding a new HTML file, you will see the new toolbar (MyToolbar) on the content field:



3.5.3.4. How to create a plugin for CKEditor

This section shows you how to create a basic CKEditor plugin.

Assuming that you will develop a *timestamp* plugin that inserts the current date and time into the editing area of CKEditor. The *timestamp* will be added after a user clicks a dedicated toolbar button. The implementation makes use of the *insertHtml* function which can be also easily adjusted to insert any other HTML elements into CKEditor.

1. Create a directory inside the *eXoPlugins* directory for CKEditor with the *timestamp* plugin.
2. Place the *plugin.js* file that contains the plugin logic inside the newly created *timestamp* folder. Also, you will need a toolbar icon for the plugin by adding an *images* folder and subsequently placing the *timestamp.png* file inside it.
3. Modify the *plugin.js* file in which you will write the behavior.

The following is the code used to create a simple plugin named *timestamp*:

```
CKEDITOR.plugins.add( 'timestamp',
{
  init: function( editor )
  {
    editor.addCommand( 'insertTimestamp',
    {
      exec : function( editor )
      {
        var timestamp = new Date();
        editor.insertHtml( 'The current date and time is: <em>' + timestamp.toString() + '</em>' );
      }
    });
    editor.ui.addButton( 'Timestamp',
    {
      label: 'Insert Timestamp',
      command: 'insertTimestamp',
      icon: this.path + 'images/timestamp.png'
    });
  }
});
```

To use the created plugin, plug it to CKEditor by using the following code:

```
(function() {CKEDITOR.plugins.addExternal('timestamp',CKEDITOR.eXoPath+'eXoPlugins/timestamp/','plugin.js');})();
....
config.extraPlugins = 'content,insertGadget,insertPortalLink,timestamp';
....
config.toolbar_MyToolbar =
[
  ['Bold', 'Italic', '-', 'NumberedList', 'BulletedList', '-', 'Link', 'Unlink', '-', 'About', 'Timestamp']
];
```

The following is the illustration about the Timestamp plugin added to the CKEditor.



3.6. Taxonomy

Taxonomy is a particular classification arranged in a hierarchical structure. Taxonomy trees in eXo Platform will help you organize your content into categories.

When you create a new taxonomy tree, you will add a pre-configured *exo:action* (*exo:scriptAction* or *exo:businessProcessAction*) to the root node of the taxonomy tree. This action is triggered when a new document is added anywhere in the taxonomy tree. The default action moves the document to the physical storage location and replaces the document in the taxonomy tree with a symlink of the *exo:taxonomyLink* type pointing to it. The physical storage location is defined by a workspace name, a path and the current date and time.

Like adding document types, taxonomy trees can be managed through the **Content Administration** portlet, or by adding .xml configuration files.

To configure taxonomy trees by adding configuration files in the `/webapp/WEB-INF/conf/acme-portal/wcm/taxonomy/` directory, create a new file called `$taxonomyName-taxonomies-configuration.xml`. For example, if the name of your taxonomy tree is "acme", the file should be named `acme-taxonomies-configuration.xml`.

You can view the file here: `$PLF-HOME_/samples/acme-website/webapp/src/main/webapp/WEB-INF/conf/acme-portal/wcm/taxonomy/acme-taxonomies-configuration.xml`.

As you can see, the value-params enable you to define the repository, workspace, name of the tree and its JCR path. You can then configure permissions for each group of users in the portal, and the triggered action when a new document is added to the taxonomy tree. Finally, you can describe the structure and names of the categories inside your taxonomy tree.

3.7. Manage Template service

The Template service enables you to create dialogs and view templates for each node type registered. Each node type may have many dialogs and view templates. The template will be used when creating or viewing nodes.

You can find the template service configuration in `/webapps/ecm-wcm-core/WEB-INF/conf/wcm-core/core-services-configuration.xml`.

```
<component>
  <key>org.exoplatform.services.cms.templates.TemplateService</key>
  <type>org.exoplatform.services.cms.templates.impl.TemplateServiceImpl</type>
</component>
```

As usual, one can register a plugin inside the service. This plugin initializes default dialogs and views template of any node type as `nt:file`, `exo:article`, `exo:workflowAction`, `exo:sendMailAction`, and more.


```

<component-plugins>
<component-plugin>
  <name>addTemplates</name>
  <set-method>addTemplates</set-method>
  <type>org.exoplatform.services.cms.templates.impl.TemplatePlugin</type>
  .....
</component-plugin>
</component-plugins>

```

With init-parameters as:

```

<init-params>
<value-param>
  <name>autoCreateInNewRepository</name>
  <value>true</value>
</value-param>
<value-param>
  <name>storedLocation</name>
  <value>war:/conf/ecm/artifacts/templates</value>
</value-param>
<value-param>
  <name>repository</name>
  <value>repository</value>
</value-param>
<object-param>
  <name>template.configuration</name>
  <description>configuration for the location of templates to inject in jcr</description>
  <object type="org.exoplatform.services.cms.templates.impl.TemplateConfig">
    <field name="nodeTypes">
      <collection type="java.util.ArrayList">
        <value>
          <object type="org.exoplatform.services.cms.templates.impl.TemplateConfig$NodeType">
            <field name="nodetypeName">
              <string>exo:article</string>
            </field>
            <field name="documentTemplate">
              <boolean>true</boolean>
            </field>
            <field name="label">
              <string>Article</string>
            </field>
            <field name="referencedView">
              <collection type="java.util.ArrayList">
                <value>
                  <object type="org.exoplatform.services.cms.templates.impl.TemplateConfig$Template">
                    <field name="templateFile">
                      <string>/article/views/view1.gtmpl</string>
                    </field>
                    <field name="roles">
                      <string>*</string>
                    </field>
                  </object>
                </value>
              </collection>
            </field>
            <field name="referencedDialog">
              <collection type="java.util.ArrayList">
                <value>
                  <object type="org.exoplatform.services.cms.templates.impl.TemplateConfig$Template">
                    <field name="templateFile">
                      <string>/article/dialogs/dialog1.gtmpl</string>
                    </field>
                    <field name="roles">
                      <string>*</string>
                    </field>
                  </object>
                </value>
              </collection>
            </field>
          </object>
        </value>
      </collection>
    </field>
  </object>
</object-param>

```

```
</field>
</object>
</value>
</collection>
</field>
</object>
</object-param>
</init-params>
```

3.8. Manage Navigation By Content

Navigation By Content is a feature which allows users to browse content of each page easily. With this feature, users experiencing eXo Platform 3.5 can navigate from a page to another or browse site content inside one page directly from a contextual menu.

3.8.1. Actual content navigation

One of the powerful features of Enterprise Content Management System (ECMS) that comes out with eXo Platform 3.5 is the ability to navigate in site contents using taxonomies. This functionality can easily be added in a page with the help of two **Content List Viewer** (CLV) portlets. The pre-configured example can be found in the **News** page of the sample ACME website. In this example, all contents in the */Sites Management/acme/events/All* node will be used.

Add "Actual content navigation" to a page

1. Log into the sample ACME website.
 2. Add a new page, for example "Events".
 3. Parameterize this page with the **Autofit Two Columns** container.
 4. Add two **Content List** portlets to each column.
 5. Add content.
- i. **Configure the left portlet as follows:**

Content List Preferences

Content Selection

Mode: ☒ By Folder ☐ By Content

Folder Path: All

Order by: Published Date

☒ Descendant ☐ Ascendant

Display Settings

Header: Browse by

Automatic Detection: ☒

Template: CategoryTree.gtmpl

Paginator: UIPaginatorDefault.gtmpl

Items per Page: 10

Show Title: ☒ Show Image: ☒ Show Summary: ☒

Show Header: ☒ Show Date: ☒ Show Link: ☒

Show Refresh: ☐ Show More Link: ☒ Show RSS Link: ☒

Advanced

Dynamic Navigation

Contextual Folder: ☐ Enabled ☒ Disabled

by: folder-id

Show in Page: Events

with: content-id

Content Visibility

☒ Restricted by Authentication ☐ Restricted by User Roles

In which:

- **Folder path** = */Sites Management/acme/events/All*: The path to the folder that contains the content.
- **Header** = *Browse by*: The title of all contents that are listed in the content list viewer.
- **Template** = *CategoryTree.gtmpl*: The template used for displaying the content list.
- **Contextual Folder** = *Disabled*: The Contextual Content property is set to "Disable", the Advanced pane is closed by default and a single content will be opened by an URL containing the content path.
- **Show in page** = *Events*: A single content in CLV will be shown in the **Events** page.
- **With** = *folder-id*: The parameter containing the content path.

ii. Configure the right portlet as follows:

Content List Preferences

Content Selection

Mode: ☒ By Folder ☐ By Content

Folder Path: *

Order by: ▼

☒ Descendant ☐ Ascendant

Display Settings

Header:

Automatic Detection: ☒

Template: ▼

Paginator: ▼

Items per Page: *

Show Title: ☒ Show Image: ☒ Show Summary: ☒

Show Header: ☒ Show Date: ☒ Show Link: ☒

Show Refresh: ☐ Show More Link: ☒ Show RSS Link: ☒

Advanced

Dynamic Navigation

Contextual Folder: ☒ Enabled ☐ Disabled

by:

Show in Page: 🔍

with:

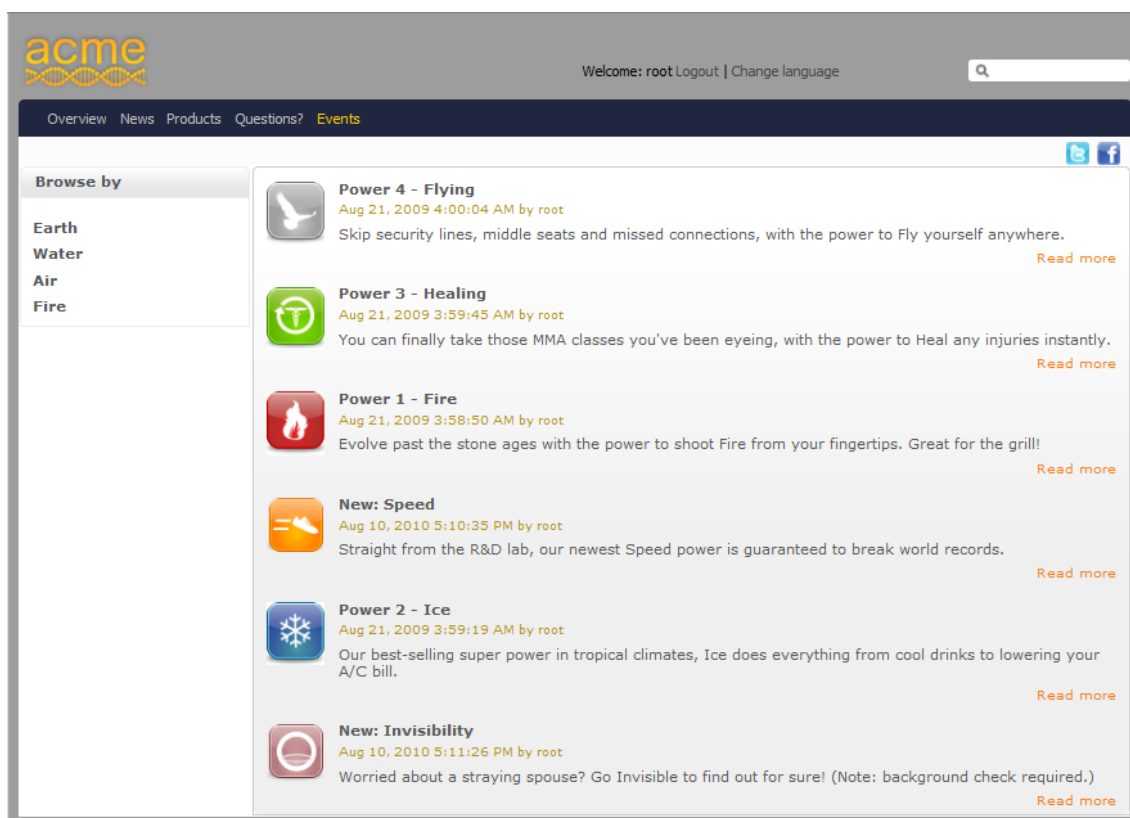
Content Visibility

☒ Restricted by Authentication ☐ Restricted by User Roles

In which:

- **Folder path** = */Sites Management/acme/events/All*: The path to the folder that contains the content.
- **Template** = *OneColumnCLVTemplate.gtmpl*: The template used for displaying the content list.
- **Contextual Folder** = *Enabled*: The Contextual Content property is set to "Enable". This portlet is configured with the provided parameter (content-id by default).
- **Show in page** = *Details*: A single content in CLV will be shown in the "Details" page.
- **With** = *content-id*: The parameter containing the content path.

As a result, the created **Events** page will look like:



You can now navigate from the left portlet to see contents displayed in the right portlet.

The new **Navigation By Content** feature will traduce this example in a contextual menu.

3.8.2. Add content to the navigation

Attach your root folder/node to some page nodes from the homepage (the drop-down menu holds your new contextual menu)

1. Go to the **Sites Explorer** page and navigate to `/Sites Management/acme/events/All`.
2. Click the **Content Navigation** button, the **Navigation** form will appear. If you do not see this button on the **Action** bar, add this button via the **Content Administration** page.
3. Fill values into the **Content Navigation** form:

Navigation Form

Parent's folder :

Visible : ☒

Target parent navigation :

Navigation Controls

List

Detail

Clickable : ☐

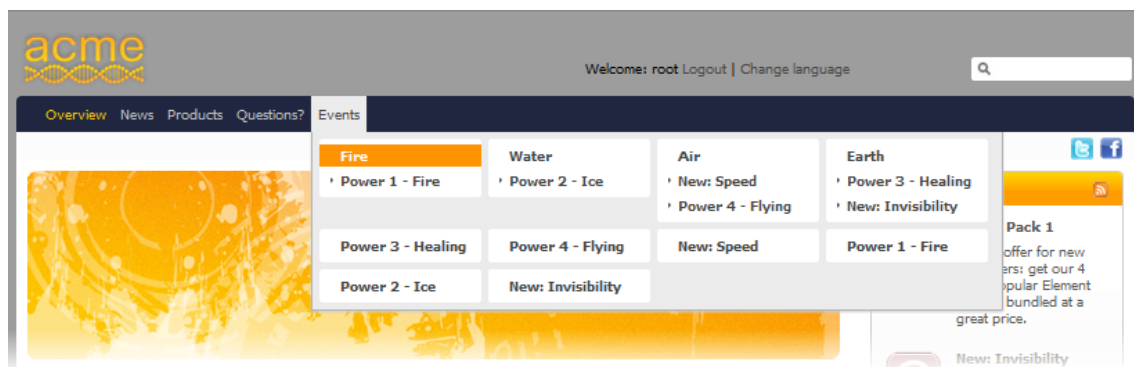
Page for list :

Page for detail :

In which:

- **Visible** = true. This node will be navigable.
- **Target parent navigation** = Events. The contextual menu will be attached to the **Events** drop-down menu.
- **Clickable** = false. This node will not be clickable.
- **Page for list** = catalog. This page is a system page that contains a **Content List Viewer** portlet and will be used to display the list of child nodes.
- **Page for detail** = detail. This page is a system page that contains a **Single Content Viewer** portlet and will be used to display details of child nodes.

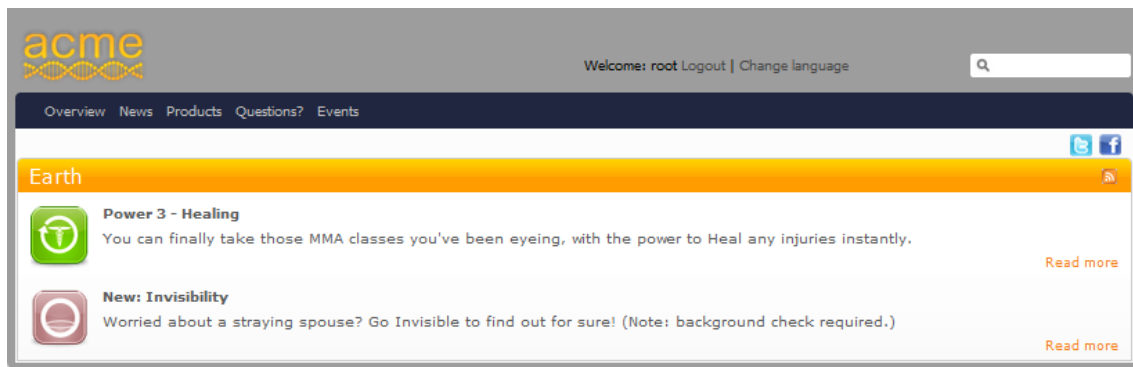
4. Save changes, then go back to the ACME homepage. You will see changes from the **Events** drop-down menu.



In which:

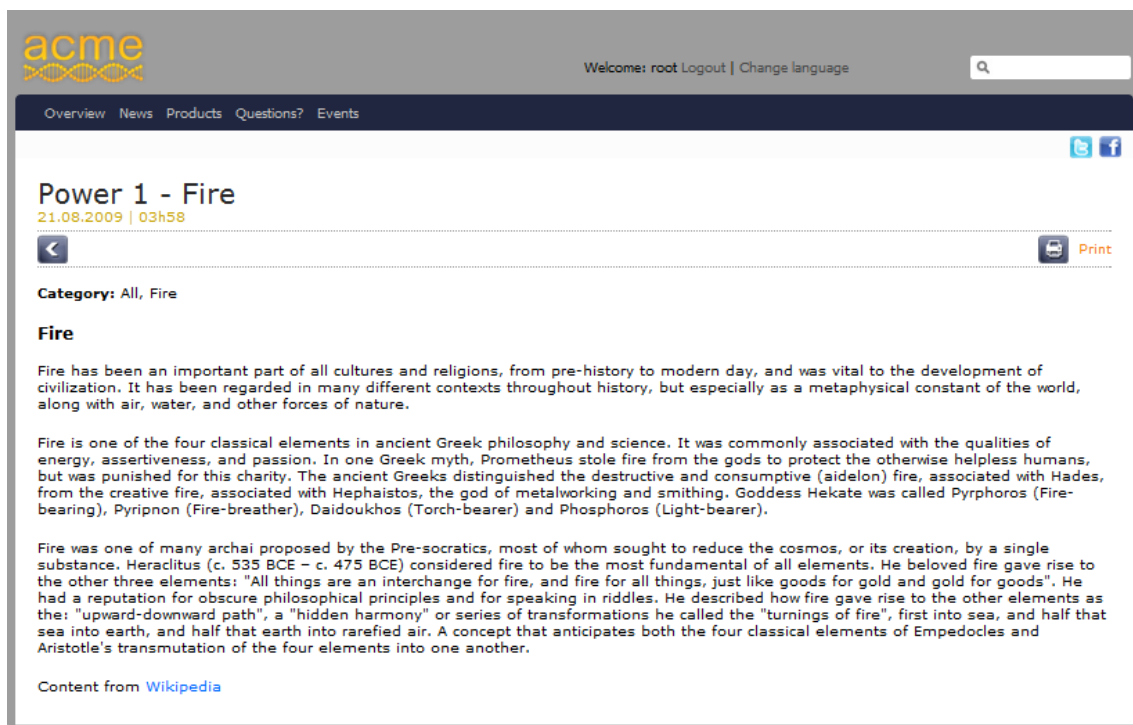
- **Visible**: The `/Sites Management/acme/events/All` node is navigable and its child nodes are rendered in the contextual menu.
- **Target parent navigation**: The `/Sites Management/acme/events/All` node is attached to the site menu item called **Events**.
- **Clickable**: The `/Sites Management/acme/events/All` node is not clickable but all of its child nodes are clickable.
- **Page for list**: The list of child nodes (if a child node is **directory/folder**) will be rendered in the following page.

Click the **Earth** menu item from the contextual menu, you will see that contents of the **Earth** directory are rendered in a separate page (catalog):



- **Page for detail:** The details of child nodes (if a child node is a sample content) will be rendered in this page.

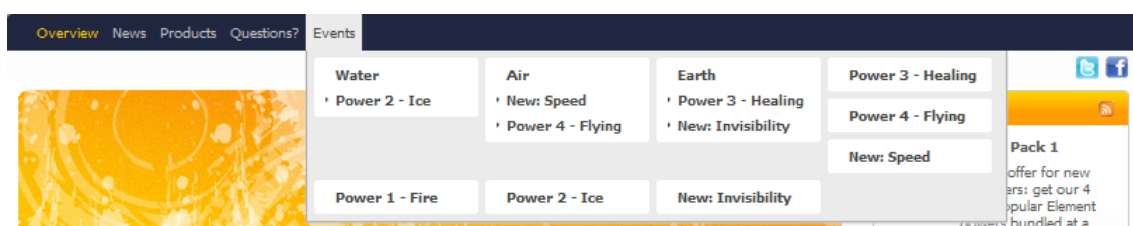
Select the **Power 1 - Fire** menu item from the contextual menu to see the **Fire** content displayed in a separate page (details):



3.8.3. Actions on Navigation By Content

Restrict the visibility of some contents

1. Go to the **Sites Explorer** page and navigate to the `/Sites Management/acme/events/All/Fire` node.
2. Click the **Content Navigation** button to open the **Navigation** form.
3. Uncheck the **Visible** field and save.
4. Go back to the ACME homepage. You will see that the **Fire** sub-menu is not displayed in the contextual menu anymore.

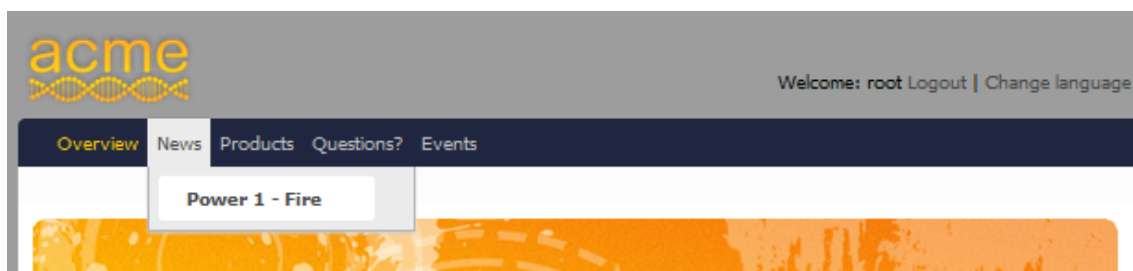


Sort elements of the contextual menu

1. Go to the **Sites Explorer** page and navigate to the */Sites Management/acme/events/All* node.
2. Select the */Sites Management/acme/events/All/Earth* node.
3. Click the **Content Navigation** button to open the **Navigation** form.
4. Set the **Display order** field to "1" and save.
5. Select the */Sites Management/acme/events/All/Water* node.
6. Click the **Content Navigation** button.
7. Set the **Display order** field to "2" and save.
8. Select the */Sites Management/acme/events/All/Air* node.
9. Click the **Content Navigation** button.
10. Set the **Display order** field to "3" and save.
11. Go back to the ACME homepage. You will see that the display order from the contextual menu is **Earth, Water, Air**. Note that the **Fire** sub-menu is not displayed because it is set to "Invisible" in the previous example.

Restore a node to the contextual menu and attach it to another page

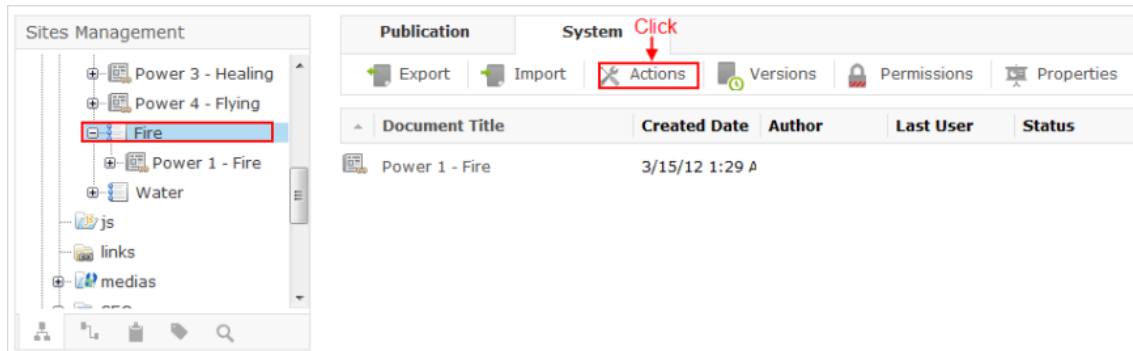
1. Go to the **Sites Explorer** page and navigate to the */Sites Management/acme/events/All/Fire* node.
2. Click the **Content Navigation** button to open the **Navigation** form.
3. Fill values into the **Navigation** form fields, including:
 - **Visible** = true
 - **Target parent navigation** = News
 - **Clickable** = false
 - **Page for list** = catalog
 - **Page for detail** = detail
4. Save changes and go back to the **Acme/Overview** homepage. You will see that the **Fire** node is attached to the **News** drop-down menu from the site menu:



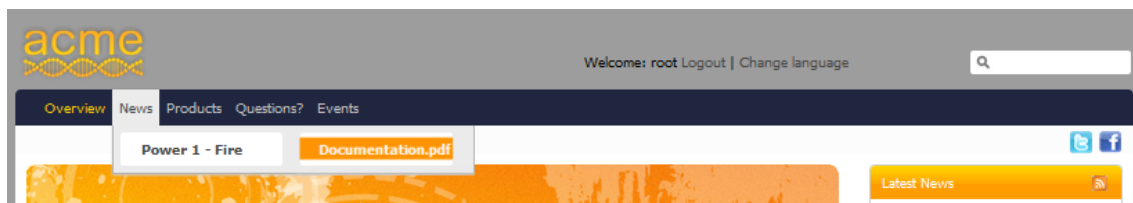
However, if you want to add your newly created content directly to the contextual menu, you need to add the **populateToMenu** action first.

Add your newly created contents to the contextual menu

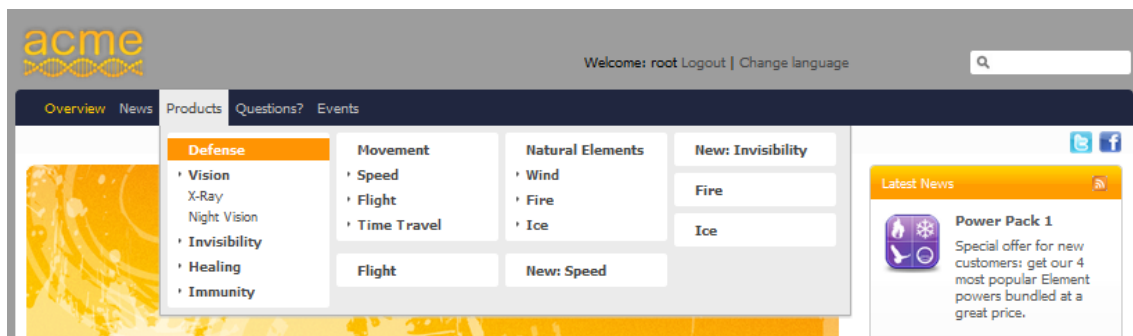
1. Go to the **Sites Explorer** page and navigate to the */Sites Management/acme/events/All/Fire* node.
2. Click the **Actions** button and add the **exo:populateToMenu** action.



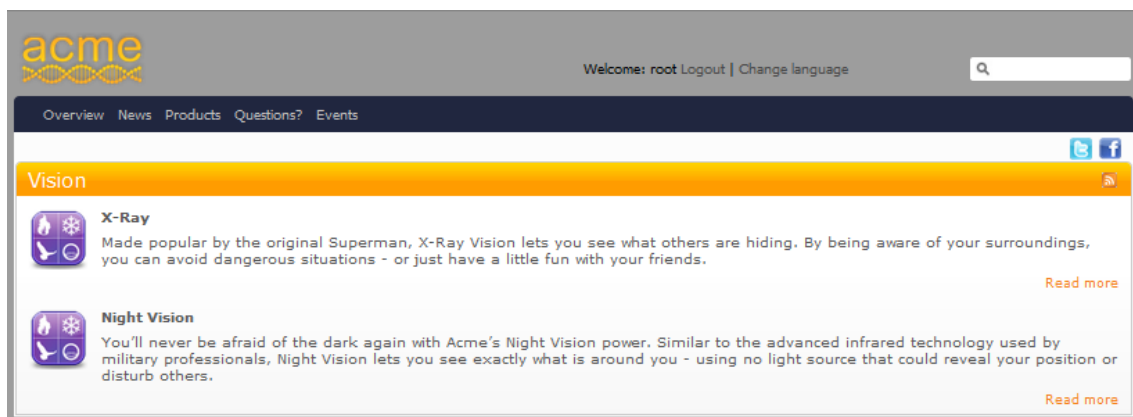
3. Create a document under the `/Sites Management/acme/events/All/Fire` node and publish it.
4. Go back to the homepage. You will see that your newly created document is added to the contextual menu.



The sample ACME website comes with a configured navigation by content menu:



You can click the **Vision** sub-menu and see contents of **Vision** directory rendered in the **catalog** page:



Select the **X-Ray** content and see the newly implemented content using new visual effects and presentation.

- "Benefits" and "Features" tabs:

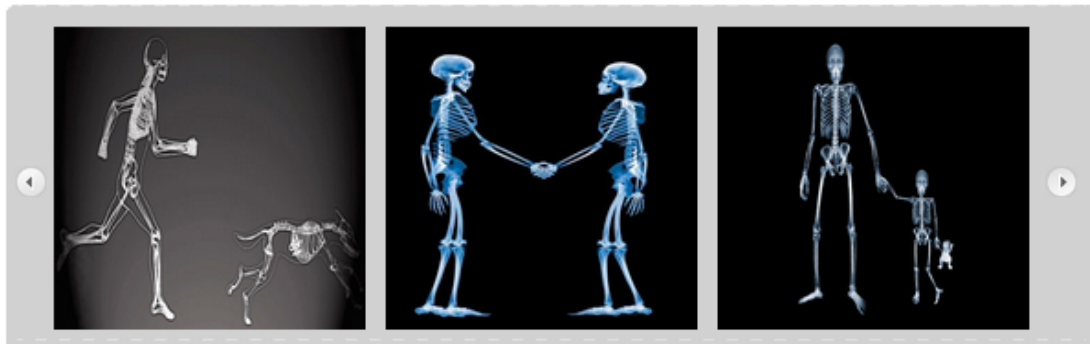
Benefits ▾

Features ▸

- Fly on any commercial airline at a heavily discounted rate, as X-Ray Vision automatically qualifies you to serve as a civilian flight marshal.
- Fulfill your Acme Superhero Community Service commitment by donating a few hours of scanning to local police or other organizations.
- Immediately detect the presence of concealed weapons or other illegal objects, so you can avoid dangerous situations.

- Coverflow section:

See it in action



- Related documents:

Resources

Sales Materials	Technical Documentation
Technical Advantages Sample Contract	Technical Advantages Sample Contract
Enterprise and Business Sample Contract	Enterprise and Business Sample Contract

3.8.4. Examples of creating data for Navigation By Content

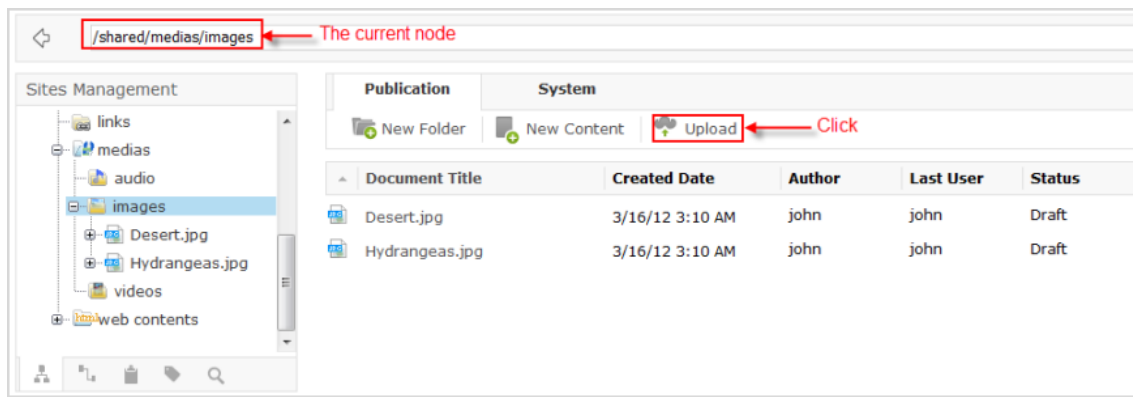
3.8.4.1. Create a Product page

Create content about the product

1. Go to the **Sites Explorer** page and navigate to *somePath/someDirectory*.
2. Click the **New Content** button on the **Action** bar. There will be a several content type appears.
3. Select the **Product** content type.
4. Fill the **Product** dialog form.
5. Save changes.

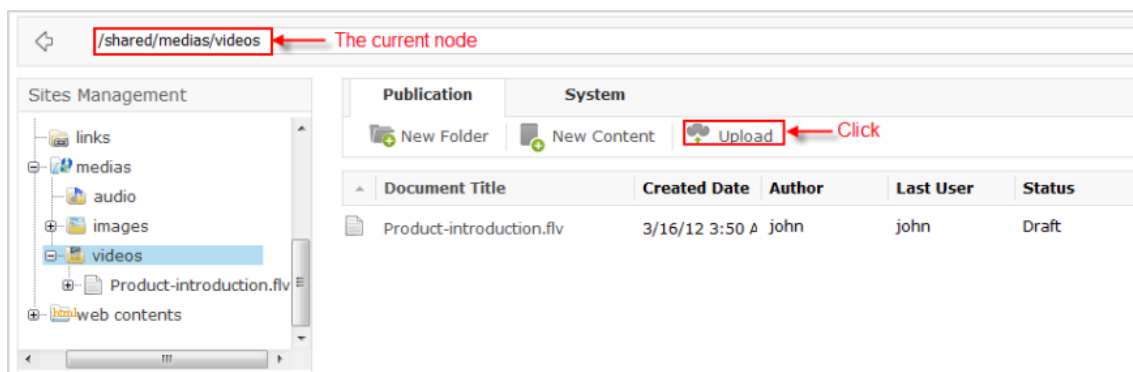
Add media files to enrich the Product page

1. Go to *somePath/someDirectory/sampleProduct/medias/images*.
2. Click **Upload** on the **Action** bar to upload some images from your local device and publish them.



3. Go to *somePath/someDirectory/sampleProduct/medias/videos*.

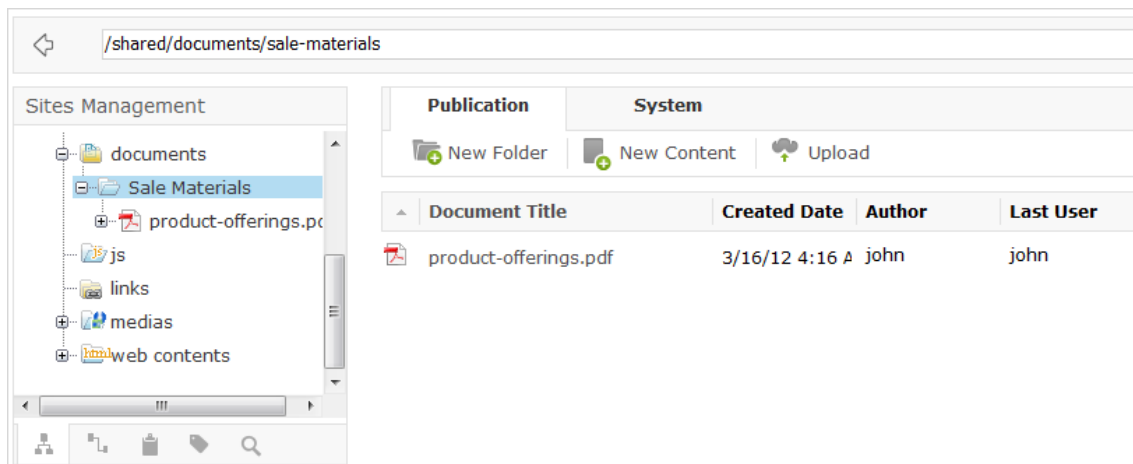
4. Click **Upload** on the **Action** bar to upload some videos from your local device and publish it.



5. Go to *somePath/someDirectory/sampleProduct/documents*.

6. Create two directories, including **Sale Materials** and **Technical Documentations**.

7. Upload a PDF document and publish it under each sub-folder.



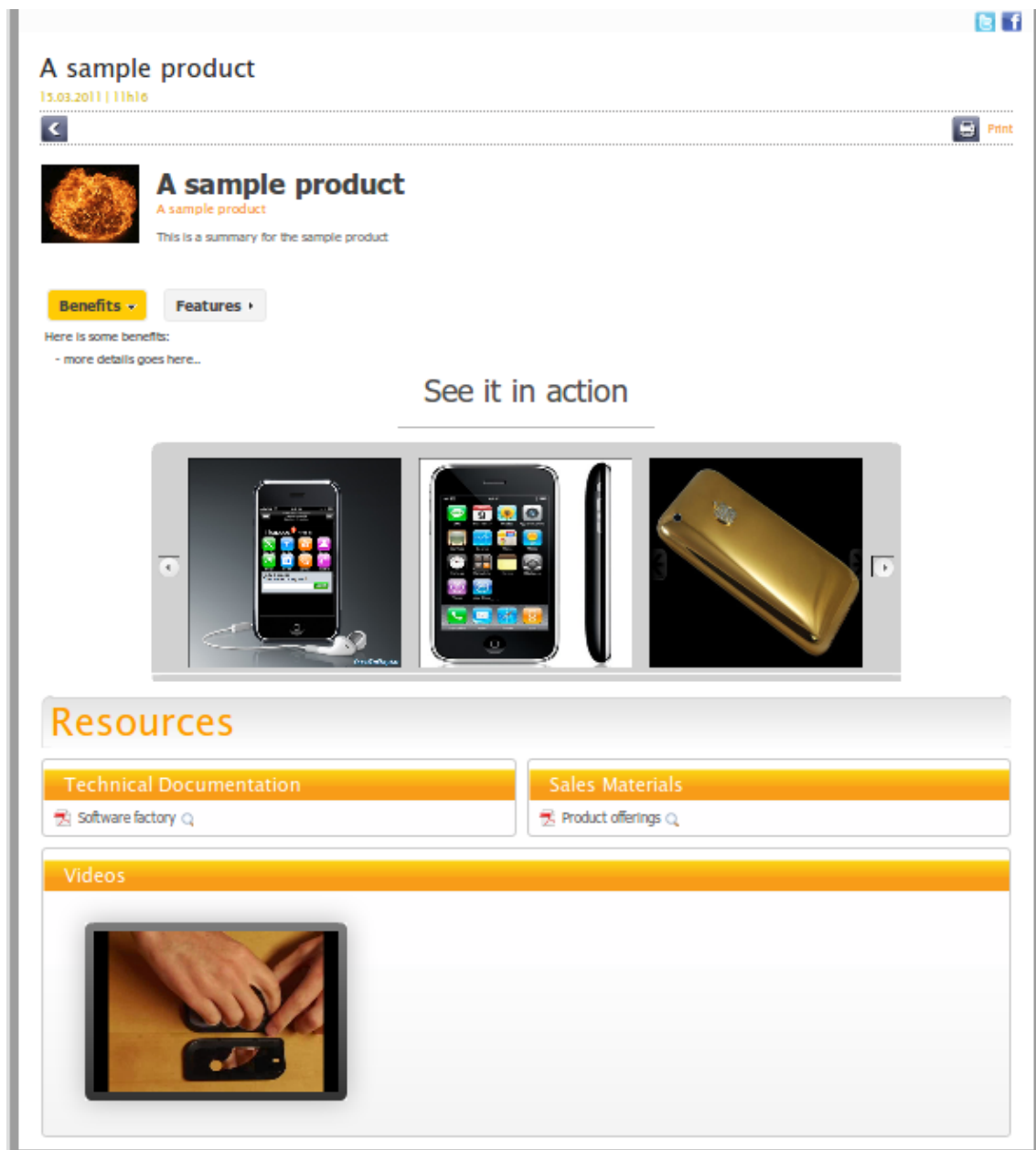
8. Add your **sampleProduct** to some categories or add it to the **Content List** portlet.

Your newly created product is now ready to be displayed in some pages.

9. Publish your newly created product. Note that you can select this content from a CLV:



As a result, the content will be displayed in a detailed page as follows:



3.8.4.2. Develop your own Product content

The sample **Product** page is composed of the following fields and folders:

- **Product** content type fields: Name, Title, Illustration Image, Summary, Benefits, and Features.

(The **Product** content type is the template specified for the **Product** page.)

- Other content folders: documents, medias/images, medias/videos.

(These folders contain documents and media files to enrich the **Product** page.)

Create fields in the Product content type

- **Name**

Other content folders are created within the product content when the **Name** field is created. This can be achieved (from the .gtmpl product dialog) as follows:

```

<tr>
<td class="FieldLabel"><%= _ctx.appRes("Product.dialog.label.name")%></td>
<td class="FieldComponent">
<%
String[] productFieldName = [{"jcrPath=/node", "mixintype=mix:votable,mix:commentable","editable=if-null","validate=name,empty"}];
uicomponent.addTextField("name", productFieldName);
String[] documentsFolder = [{"jcrPath=/node/documents", "nodetype=nt:folder","mixintype=exo:documentFolder", "defaultValues=documents"}];
String[] mediasFolder = [{"jcrPath=/node/medias", "nodetype=exo:multimediaFolder", "defaultValues=medias"}];
String[] imagesFolder = [{"jcrPath=/node/medias/images", "nodetype=nt:folder", "defaultValues=images"}];
String[] videoFolder = [{"jcrPath=/node/medias/videos", "nodetype=nt:folder", "defaultValues=videos"}];
uicomponent.addHiddenField("documentsFolder", documentsFolder);
uicomponent.addHiddenField("mediasFolder", mediasFolder);
uicomponent.addHiddenField("imagesFolder", imagesFolder);
uicomponent.addHiddenField("videoFolder", videoFolder);
%>
</td>
</tr>

```

Other fields are created almost in the same way:

- **Title:**

```

<tr>
<td class="FieldLabel"><%= _ctx.appRes("Product.dialog.label.title")%></td>
<td class="FieldComponent">
<%
String[] productFieldTitle = [{"jcrPath=/node/exo:title", "validate=empty", "editable=if-null"}];
uicomponent.addTextField("title", productFieldTitle);
%>
</td>
</tr>

```

- **Illustration image:**

```

<%
private void setUploadFields(name) {
String[] illustrationHiddenField1 = [{"jcrPath=/node/medias/images/illustration", "nodetype=nt:file", "mixintype=mix:referenceable", "defaultValues=illustration"}];
String[] illustrationHiddenField2 = [{"jcrPath=/node/medias/images/illustration/jcr:content", "nodetype=nt:resource", "mixintype=dc:elementSet", "visible=false"}];
String[] illustrationHiddenField3 = [{"jcrPath=/node/medias/images/illustration/jcr:content/jcr:encoding", "visible=false", "UTF-8"}];
String[] illustrationHiddenField4 = [{"jcrPath=/node/medias/images/illustration/jcr:content/jcr:lastModified", "visible=false"}];
String[] illustrationHiddenField5 = [{"jcrPath=/node/medias/images/illustration/jcr:content/dc:date", "visible=false"}];
uicomponent.addHiddenField("illustrationHiddenField1", illustrationHiddenField1);
uicomponent.addHiddenField("illustrationHiddenField2", illustrationHiddenField2);
uicomponent.addHiddenField("illustrationHiddenField3", illustrationHiddenField3);
uicomponent.addCalendarField("illustrationHiddenField4", illustrationHiddenField4);
uicomponent.addCalendarField("illustrationHiddenField5", illustrationHiddenField5);
String[] fieldImage = [{"jcrPath=/node/medias/images/illustration/jcr:content/jcr:data"}];
uicomponent.addUploadField(name, fieldImage);
}
%>
<tr>
<td class="FieldLabel"><%= _ctx.appRes("Product.dialog.label.illustrationImage")%></td>
<td class="FieldComponent">
<%
String illustration = "illustration";
if(ProductNode != null && ProductNode.hasNode("medias/images/illustration") && (uicomponent.findComponentById(illustration) == null)) {
def imageNode = ProductNode.getNode("medias/images/illustration");
def resourceNode = imageNode.getNode("jcr:content");
if(resourceNode.getProperty("jcr:data").getStream().available() > 0) {
def imgSrc = uicomponent.getImage(imageNode, "jcr:content");
def actionLink = uicomponent.event("RemoveData", "/medias/images/illustration/jcr:content");
%>
<div>

```

```

<image src="$imgSrc" width="100px" height="80px"/>
<a onclick="$actionLink">
  
</a>
</div>
<%
} else {
  setUpUploadFields(illustration);
}
} else {
  setUpUploadFields(illustration);
}
%>
</td>
</tr>

```

- **Summary:**

```

<tr>
<td class="FieldLabel"><%= _ctx.appRes("Product.dialog.label.summary")%></td>
<td class="FieldComponent">
<%
String[] fieldSummary = [{"jcrPath=/node/exo:summary", "options=Basic", ""}];
uicomponent.addRichTextField("summary", fieldSummary);
%>
</td>
</tr>

```

- **Benefits:**

```

<tr>
<td class="FieldLabel"><%= _ctx.appRes("Product.dialog.label.benefits")%></td>
<td class="FieldComponent">
<div class="UIFCKEditor">
<%
String[] productFieldBenefits = [{"jcrPath=/node/exo:productBenefits", "options=toolbar:CompleteWCM", ""}];
uicomponent.addRichTextField("productBenefits", productFieldBenefits);
%>
</div>
</td>
</tr>

```

- **Features:**

```

<tr>
<td class="FieldLabel"><%= _ctx.appRes("Product.dialog.label.features")%></td>
<td class="FieldComponent">
<div class="UIFCKEditor">
<%
String[] productFieldFeatures = [{"jcrPath=/node/exo:productFeatures", "options=toolbar:CompleteWCM", ""}];
uicomponent.addRichTextField("productFeatures", productFieldFeatures);
%>
</div>
</td>
</tr>

```

Develop the Product's view form

The illustration image, title and summary are grouped together:

```
<!-- Hot news -->
<div class="BigNews ClearFix">
<!-- Begin illustrative image -->
<%
  RESTImagesRendererService imagesRenderer = uicomponent.getApplicationComponent(RESTImagesRendererService.class);
  def imageURI = imagesRenderer.generateImageURI(currentNode.getNode("medias/images/illustration"),null);
  if (imageURI != null){
    %>
    <a class="Image"></a>
    <%
  }
  %>
<div class="Content">
<!-- Begin title -->
<%
  if(currentNode.hasProperty("exo:title")) {
    def title = currentNode.getProperty("exo:title").getString();
    %>
    <a href="#" class="Title">$title</a>
    <div class="Index1">$title</div>
    <%
  }
  %>
<!-- End title -->
<!-- Begin summary -->
<%
  if(currentNode.hasProperty("exo:summary")) {
    def summary = currentNode.getProperty("exo:summary").getString();
    %>
    <div class="Summary">$summary</div>
    <%
  }
  %>
<!-- End summary -->
</div>
</div>
```

In which:

- Name: The name of the product.
- Title: The title of the product.
- Illustration Image: The image that is used as an illustration for the product.
- Summary: The summary about the product that goes with the illustration.
- Benefits: The benefits of the product.
- Features: The features of the product.

Benefits and Features fields are rendered in two tabs using the jQuery library (already integrated into eXo Platform 3.5).

```
<div id="sectionsTabs" class="ui-tabs">
<ul class="ui-tabs-nav ClearFix">
<li class="ui-state-default">
<!-- Begin Benefits head section -->
<a class="ArrowCtrl" href="#tab-benefits"><%= _ctx.appRes("Product.view.label.benefits")%></a>
<!-- End Benefits head section -->
</li>
<li class="ui-tabs-selected">
<!-- Begin Features head section -->
<a class="ArrowCtrl" href="#tab-features"><%= _ctx.appRes("Product.view.label.features")%></a>
<!-- End Features head section -->
</li>
</ul>
```

```

</li>
</ul>
<div id="tab-benefits">
  <%
    if(currentNode.hasProperty("exo:productBenefits")) {
      def benefits = currentNode.getProperty("exo:productBenefits").getString();
      print benefits;
    }
  %>
</div>
<div id="tab-features">
  <%
    if(currentNode.hasProperty("exo:productFeatures")) {
      def features = currentNode.getProperty("exo:productFeatures").getString();
      print features;
    }
  %>
</div>
</div>

<script type="text/javascript">
jQuery.noConflict();
jQuery(document).ready(function() {
  jQuery("#sectionsTabs").tabs();
});
</script>

```

- The jQuery-based feature is used to display the product's images (in the coverflow view) from the images folder.

```

<div class="jQProBoxC">
<!-- Begin jCarouselLite part -->
<button class="jQprev">&nbsp;</button>
<div class="jCarouselLite">
  <ul>
    <%
      FOR IMAGE IN PRODUCT'S IMAGE FOLDER
      String imgSrc = "";
      /*
      GET THE IMAGE PATH
      imgSrc = GET THE IMAGE PATH;
      */
    %>
    <li></li>
    <%
    %>
  </ul>
</div>
<button class="jQnext">&nbsp;</button>
<!-- End jCarouselLite part -->
</div>
<script type="text/javascript">
jQuery.noConflict();
jQuery(document).ready(function(){
  //jQuery.noConflict();
  jQuery(".jCarouselLite").jCarouselLite({
    btnNext: ".jQprev",
    btnPrev: ".jQnext",
    //auto: 500,
    //speed: 500
  });
});
</script>

```

- Documents and videos are simply displayed within the view form as follows:

1. Get the node path to a document or video.
2. Use some customized CSS classes to display a link for this node.

Labels and/or messages are displayed in the dialog and the view form are localized.

The use of this instruction is described as below:

```
<td class="FieldLabel"><%= _ctx.appRes("Product.dialog.label.summary")%></td>
(...)
<h1><%= _ctx.appRes("Product.view.label.seelItInAction")%></h1>
```

This can be achieved by adding locale files. For example:

```
<Product>
<view>
  <label>
    <benefits>Benefits</benefits>
    <features>Features</features>
    <seelItInAction>See it in action</seelItInAction>
    <resources>Resources</resources>
    <videos>Videos</videos>
  </label>
</view>
</Product>
```

Make sure that locale files are added to the resource bundle configuration. If locale files (dialogs and views) are under the *classes/locale/wcm* directory, use the following code:

```
<value>locale.wcm.dialogs</value>
<value>locale.wcm.views</value>
```


Work With Applications

Applications play an important role in each eXo service, so it is necessary for you to further understand about them.

In this chapter, you will know how to integrate an application into your portal, and how to develop your own application:

- [Integrate an application](#)
- [Develop your own application](#)
 - [Gadget vs Portlet](#)
 - [Develop a gadget for eXo Platform](#)
 - [Portlet Bridges](#)

4.1. Integrate an application

To add a portlet to one of your portal's pages, you should configure the *pages.xml* file located at */war/src/main/webapp/WEB-INF/conf/sample-ext/portal/portal/classic/*.

Here is an example of the portlet configuration in the *pages.xml* file:

```
<portlet-application>
  <portlet>
    <application-ref>presentation</application-ref>
    <portlet-ref>SingleContentViewer</portlet-ref>
    <preferences>
      <preference>
        <name>repository</name>
        <value>repository</value>
        <read-only>false</read-only>
      </preference>
      <preference>
        <name>workspace</name>
        <value>collaboration</value>
        <read-only>false</read-only>
      </preference>
      <preference>
        <name>nodeIdentifier</name>
        <value>/sites/content/live/acme/web/contents/site/artifacts/Introduce</value>
        <read-only>false</read-only>
      </preference>
      <!-- ... -->
    </preferences>
  </portlet>
  <title>Homepage</title>
  <access-permissions>Everyone</access-permissions>
  <show-info-bar>false</show-info-bar>
  <show-application-state>false</show-application-state>
  <show-application-mode>false</show-application-mode>
</portlet-application>
```

Details:

XML tag name	Description
<code>application-ref</code>	The name of the webapp that contains the portlet.

XML tag name	Description
<code>portlet-ref</code>	The name of the portlet.
<code>title</code>	The title of the page.
<code>access-permission</code>	Define who can access the portlet.
<code>show-info-bar</code>	Show the top bar with the portlet title.
<code>show-application-state</code>	Show the collapse/expand icons.
<code>show-application-mode</code>	Show the change portlet mode icon.
<code>preferences</code>	Contain a list of <i>preferences</i> specific to each portlet. Each <i>preference</i> has a <i>name</i> and a <i>value</i> . You can also lock it by setting the <i>read-only</i> element to "true". To learn more, refer to eXo JCR and Extension Services Reference .

4.2. Develop your own application

4.2.1. Gadget vs Portlet

It is important to understand distinctions between gadgets and portlets. Portlets are user interface components that provide fragments of markup code from the server side, while gadgets generate dynamic web content on the client side. With Gadgets, small applications can be built quickly, and mashed up on the client side using the lightweight Web-Oriented Architecture (WOA) technologies, like REST or RSS.



Note

For more information on how to develop gadgets and portlets, see the [Portlet development](#) and [Gadget development](#) sections.

4.2.2. Develop a gadget for eXo Platform

Because a gadget is basically an independent HTML content, the gadget UI such as layout, font, color may be different. Thus, making consistent in the look and feel of all eXo Platform gadgets is very important. In this part, it is assumed that developers have already known how to write a gadget in eXo Platform. The information here helps developers make a consistent look and feel with eXo Platform skin, even when this skin may be changed in the future.



Note

To get more information on how to develop gadgets, see the [Gadget development](#) and [Develop gadgets via a powerful web-based IDE of eXo Platform](#) sections.

4.2.2.1. Resources

To achieve the consistent look and feel, you have to collect the common features of all gadgets as much as possible and put in a place where it can be shared for all gadgets. You will use `exo-gadget-resources` for this purpose. It is a `.war` file that contains commonly used static resources (stylesheets, images, JavaScript libraries, and more) available for all gadgets in eXo Platform at runtime:

```
/exo-gadget-resources
|__skin
```

```

| |__exo-gadget
| | |__images
| | |__gadget-common.css
| | |__...(3rd-party components' CSS)
| |__script
| | |__jquery
| | | |__1.6.2
| | | |__...(other jQuery versions)
| | |__plugins
| |__utils

```

The resources are divided into 2 categories: skin and script.

Skin: is the place for the shared stylesheets of the gadgets (*exo-gadget/gadget-common.css*) and other third-party components styles adapted to the eXo Platform skin (jqPlot, Flexigrid, and more). This is a copy of the component's original CSS with some modifications to match the eXo Platform's skin. You can find this original file at the component's folder under *exo-gadget-resources/script*, then link to it or make your own copy (put it in your gadget's folder and refer to it in gadget's .xml file) to suit your need.

The *gadget-common.css* file is the main place for the global stylesheets. When the eXo Platform skin is changed, updating stylesheets in this file will affect all gadgets skins accordingly. In this file, you will define stylesheets applied for all gadgets, such as gadget title, gadget body, fonts, colors, tables, and some commonly used icons, such as drop-down arrow, list bullet, setting button, and more.

For example:

- `UIGadgetThemes`: the gadget container.
- `TitGad`: the gadget title.
- `ContTit`: the gadget title content.
- `GadCont`: the gadget content.
- `SettingButton`: the setting button for gadget's User Preferences.

Script: is the place for commonly used third-party JavaScript libraries (e.g: jQuery and its plugins) and a library of useful utility scripts (the `utils` folder).

jQuery and plugins:

- `jquery/<version>`: [jQuery JavaScript library](#).
- `jquery/plugins/jqplot`: [Charts and Graphs for jQuery](#).
- `jquery/plugins/flexigrid`: [Lightweight but rich data grid](#).
- `jquery/plugins/date.js`: [JavaScript date library](#).
- `jquery/plugins/jquery.timers`: [JavaScript timer](#).

(Here you should keep the latest and several versions of jQuery because some plugins may not work with the latest version. Several versions of a plugin are also kept).

The utilities scripts:

- `utils/pretty.date.js`: Calculate the difference from a point of time in the past to the present and display "4 months 3 weeks ago", for example.

4.2.2.2. Apply for a gadget

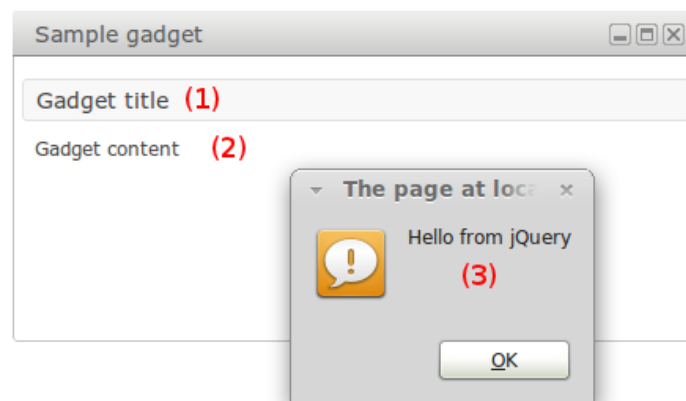
A gadget should use static resources available in *exo-gadget-resources* instead of including them in their own package. This helps reduce packaging size, avoid duplication (considering that every gadget includes a version of jQuery in its own package) and take advantages of automatic skin changing/updating when the resources of *exo-gadget-resources* are updated to the new eXo Platform skin. To make it work, the applied gadget must use the CSS classes defined in *gadget-common.css* (at least for the gadget title) like the sample gadget below:

```

<Module>
<ModulePrefs title="Sample gadget"/>
<Content type="html">
<head>
<link href="/exo-gadget-resources/skin/exo-gadget/gadget-common.css" rel="stylesheet" type="text/css"/>
<script language="javascript" src="/exo-gadget-resources/script/jquery/1.6.2/jquery.min.js" type="text/javascript"/>
<script language="javascript" type="text/javascript">
  $(function(){
    alert("Hello from jQuery"); (3)
  });
</script>
</head>
<body>
<div class="UIGadgetThemes">
<div class="TitGad ClearFix">
  <div class="ContTit">Gadget title</div> (1)
</div>
<div class="GadCont"> (2)
  Gadget content
</div>
</div>
</body>
</Content>
</Module>

```

The sample gadget:



The sample user settings of a gadget

The following gadget gives the demo of a user settings screen which uses eXo Platform standard icons (setting button, list item bullet, and more) that are defined in the *gadget-common.css*.

```

<Module>
<ModulePrefs title="Setting demo">
  <Require feature="dynamic-height"/>
  <Require feature="setprefs"/>
</ModulePrefs>
<Content type="html">
<head>
<link href="/exo-gadget-resources/skin/exo-gadget/gadget-common.css" rel="stylesheet" type="text/css"/>
<style type="text/css">
  .SettingButton:hover {cursor:pointer;}
</style>
<script language="javascript" src="/exo-gadget-resources/script/jquery/1.6.2/jquery.min.js" type="text/javascript"/>
<script language="javascript" type="text/javascript">

```

```

$(function(){
  var prefs = new gadgets.Prefs();
  var defaultNumItems = 3;

  function displayItems(){
    var numItems = prefs.getInt("numItems") || defaultNumItems;
    $("#content").html("");
    for(i=0; i<=numItems; i++) {
      $("#content").append("<div class='IconLink'>Item " + (i+1) + "</div>");  (3)
    }
    gadgets.window.adjustHeight($(".GadCont").get(0).offsetHeight);
  }

  $(".SettingButton").live("click", function(){
    $("#txtNumItems").val(prefs.getInt("numItems") || defaultNumItems);
    $(".#setting").toggle();
    gadgets.window.adjustHeight($(".GadCont").get(0).offsetHeight);
  });

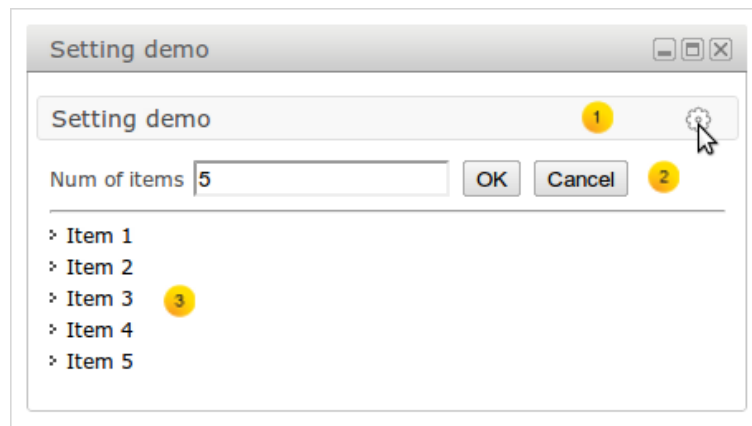
  $(".#btnOk").live("click", function(){
    var sNumItems = $(".#txtNumItems").val();
    prefs.set("numItems", parseInt(sNumItems) || defaultNumItems);
    $(".#setting").hide();
    displayItems();
  });

  $(".#btnCancel").live("click", function(){
    $(".#setting").hide();
    gadgets.window.adjustHeight($(".GadCont").get(0).offsetHeight);
  });

  displayItems();
});

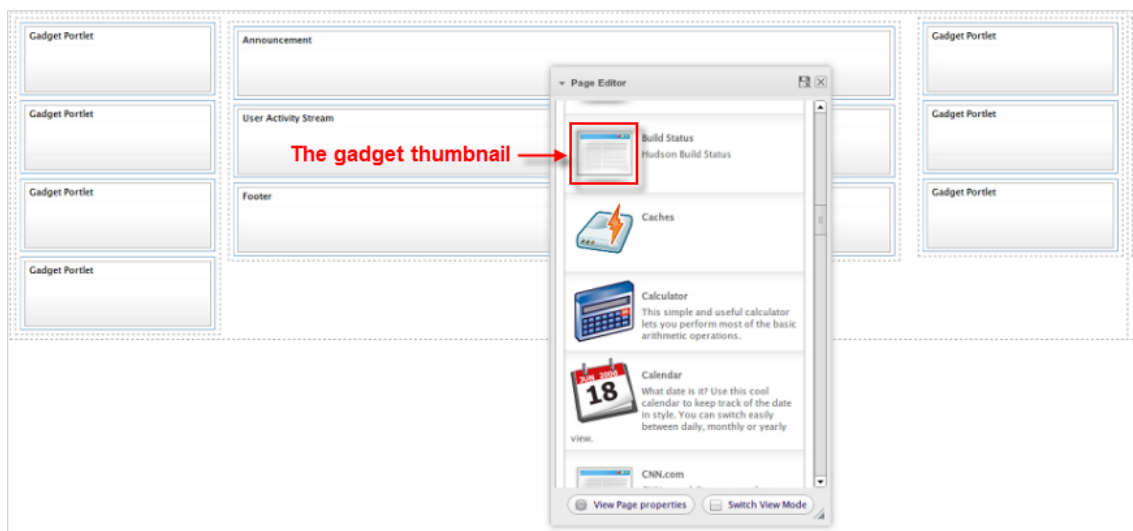
</script>
</head>
<body>
<div class="UIGadgetThemes">
<div class="TitGad ClearFix">
<div class="ContTit">
  Setting demo
  <div class="SettingButton" style="display:block; width:20px; height:20px"/>  (1)
</div>
</div>
<div class="GadCont">
<div id="setting" style="display:none;">  (2)
  <label for="txtNumItems">Num of items</label>
  <input id="txtNumItems" type="text"/>
  <input id="btnOk" type="button" value="OK"/>
  <input id="btnCancel" type="button" value="Cancel"/>
  <hr/>
</div>
<div id="content"/>
</div>
</div>
</body>
</Content>
</Module>

```



4.2.2.3. Customize the gadget thumbnail

The gadget thumbnails are displayed in the **Page Editor** window when you edit a page. The thumbnail image size needs to be consistent for all gadgets in the list. The current size (in eXo Platform 3.5) is 80 x 80px, so you should select an image of this size in PNG (preferred), JPG or GIF format for your gadget thumbnail.



- The image can also be one from a public website (absolute URL), for example: `<ModulePrefs title="Sample gadget" thumbnail="http://www.example.com/images/sample-icon.jpg"/>`; or from an internal image (relative URL): `<ModulePrefs title="Sample gadget" thumbnail="image/sample-icon80x80.png"/>`.

4.2.3. Portlet Bridges

The Portlet Bridge is an adapter for a web framework to the portlet container runtime. It works ideally with framework that does not expose the servlet container with the limited support for the full portlet API.

The JavaTM Specification Request 168 Portlet Specification (JSR 168) standardizes how components for portal servers are developed. This standard has industry backing from major portal server vendors. A Portlet Bridge allows you to create a JSR-168 compliant portlet with very little change on your existing web application.

For example, the JSF Bridge allows you to transparently deploy your existing JSF Applications as a Portlet Application or Web Application. For more details, see <http://wiki.apache.org/myfaces/PortletBridge>.

The JBoss implementation of the Portlet Bridge has enhancements to support other web frameworks, such as RichFaces and Seam. For more details, see <http://jboss.org/portletbridge/docs.html>.

System Integration

This chapter will show you how to integrate eXo Platform 3.5 into your information system through the specific topics below:

- [Authentication](#)
 - [Single-Sign-On \(SSO\)](#)
 - [Central Authentication Service \(CAS\)](#)
 - [Kerberos SSO on Active Directory](#)
- [Users integration](#)
 - [Organization Service](#)
 - [Memberships, Groups and Users](#)
 - [Organization API](#)
- [LDAP Integration](#)
 - [Connection Settings](#)
 - [Organization Service Configuration](#)
 - [Active Directory sample configuration](#)
 - [Picketlink IDM](#)
- [Email](#)

5.1. Authentication

5.1.1. Single-Sign-On (SSO)

When logging into the portal, you can gain access to many systems through portlets using a single identity. However, in many cases, the portal infrastructure must be integrated with other SSO-enabled systems. There are many different Identity Management solutions available. The GateIn documentation gives detailed configuration for different SSO implementation. For more details, see [SSO - Single Sign On](#).

5.1.2. Central Authentication Service (CAS)

Central Authentication Service (CAS) is a Web Single-Sign-On (WebSSO), developed by JA-SIG as an open source project. CAS enables you to work on different applications to log in only once and to be recognized and authenticated by all applications. Details about CAS can be found [here](#).

The CAS integration consists of two steps:

- Installing or configuring the CAS server.
- Setting up the portal to use the CAS server.

For more information on CAS configuration, see [here](#).

5.1.3. Kerberos SSO on Active Directory

eXo Portal 3.5 supports the Kerberos authentication on a Microsoft Active Directory. You will need to configure both your Active Directory server and the application server.

The implementation makes possible to use SPNEGO or NTLM. The client will get two authentication headers, including **Negotiate** and **NTLM** and will use whichever supported by the browser. In Firefox, it is possible to manage authentication types, but it is not in Internet Explorer; therefore, SPNEGO will be used.

To learn more about how to configure Kerberos SSO, see [here](#).

5.2. Users integration

5.2.1. Organization Service

To specify the initial Organization configuration, the content of your extension.war in */WEB-INF/conf/organization/organization-configuration.xml* should be edited. This file uses the portal XML configuration schema. It lists several configuration plugins.

The plugin of *org.exoplatform.services.organization.OrganizationDatabaseInitializer* type is used to specify a list of membership types, groups and users to be created.

5.2.2. Memberships, Groups and Users

The predefined membership types are specified in the **membershipType** field of the OrganizationConfig plugin parameter.

```
<field name="membershipType">
  <collection type="java.util.ArrayList">
    <value>
      <object type="org.exoplatform.services.organization.OrganizationConfig$MembershipType">
        <field name="type">
          <string>member</string>
        </field>
        <field name="description">
          <string>member membership type</string>
        </field>
      </object>
    </value>
    <value>
      <object type="org.exoplatform.services.organization.OrganizationConfig$MembershipType">
        <field name="type">
          <string>owner</string>
        </field>
        <field name="description">
          <string>owner membership type</string>
        </field>
      </object>
    </value>
  </collection>
</field>
```

The predefined groups are specified in the **group** field of the OrganizationConfig plugin parameter.

```
<field name="group">
  <collection type="java.util.ArrayList">
    <value>
      <object type="org.exoplatform.services.organization.OrganizationConfig$Group">
        <field name="name">
          <string>portal</string>
        </field>
        <field name="parentId">
          <string/>
        </field>
        <field name="type">
          <string>hierachy</string>
        </field>
      </object>
    </value>
  </collection>
</field>
```

```

    <field name="description">
      <string>the /portal group</string>
    </field>
  </object>
</value>
<value>
  <object type="org.exoplatform.services.organization.OrganizationConfig$Group">
    <field name="name">
      <string>community</string>
    </field>
    <field name="parentId">
      <string>/portal</string>
    </field>
    <field name="type">
      <string>hierachy</string>
    </field>
    <field name="description">
      <string>the /portal/community group</string>
    </field>
  </object>
</value>
...
</collection>
</field>

```

The predefined users are specified in the **membershipType** field of the OrganizationConfig plugin parameter.

```

<field name="user">
  <collection type="java.util.ArrayList">
    <value>
      <object type="org.exoplatform.services.organization.OrganizationConfig$User">
        <field name="userName">
          <string>root</string>
        </field>
        <field name="password">
          <string>exo</string>
        </field>
        <field name="firstName">
          <string>root</string>
        </field>
        <field name="lastName">
          <string>root</string>
        </field>
        <field name="email">
          <string>exoadmin@localhost</string>
        </field>
        <field name="groups">
          <string>member:/admin,member:/user,owner:/portal/admin</string>
        </field>
      </object>
    </value>
    <value>
      <object type="org.exoplatform.services.organization.OrganizationConfig$User">
        <field name="userName">
          <string>exo</string>
        </field>
        <field name="password">
          <string>exo</string>
        </field>
        <field name="firstName">
          <string>site</string>
        </field>
        <field name="lastName">
          <string>site</string>
        </field>
        <field name="email">
          <string>exo@localhost</string>
        </field>
        <field name="groups">
          <string>member:/user</string>
        </field>
      </object>
    </value>
  </collection>
</field>

```

```

    </field>
  </object>
</value>
...
</collection>
</field>

```

5.2.3. Organization API

The *exo.platform.services.organization* package has five main components: user, user profile, group, membership type and membership. There is an additional component that serves as an entry point into Organization API - *OrganizationService* component which provides handling functionality for five components. For more details, see the [Organization API](#) section.

5.3. LDAP Integration

If you have an existing LDAP server, the eXo predefined settings will likely not match your directory structure. eXo LDAP organization service implementation was written with flexibility in mind and can certainly be configured to meet your requirements.

The configuration is done in the *ldap-configuration.xml* file, and this part will explain the numerous parameters which it contains.

5.3.1. Connection Settings

First, start by connection settings which will tell eXo how to connect to your directory server. These settings are very close to the [JNDI API](#) context parameters. This configuration is activated by the init-param *ldap.config* of service *LDAPServiceImpl*.

```

<component>
  <key>org.exoplatform.services.ldap.LDAPService</key>
  <type>org.exoplatform.services.ldap.impl.LDAPServiceImpl</type>
  <init-params>
    <object-param>
      <name>ldap.config</name>
      <description>Default ldap config</description>
      <object type="org.exoplatform.services.ldap.impl.LDAPConnectionConfig">
        <field name="providerURL">
          <string>ldap://127.0.0.1:389,10.0.0.1:389</string>
        </field>
        <field name="rootdn">
          <string>CN=Manager,DC=exoplatform,DC=org</string>
        </field>
        <field name="password">
          <string>secret</string>
        </field>
        <!-- field name="authenticationType"><string>simple</string></field -->
        <field name="version">
          <string>3</string>
        </field>
        <field name="referralMode">
          <string>follow</string>
        </field>
        <!-- field name="serverName"><string>active.directory</string></field -->
      </object>
    </object-param>
  </init-params>
</component>

```

- **providerURL**: LDAP server URL (see [PROVIDER URL](#)). For multiple LDAP servers, use comma separated list of host:port (For example, [ldap://127.0.0.1:389,10.0.0.1:389](#)).

- **rootdn**: distinguished name of user that will be used by the service to authenticate on the server (see [SECURITY PRINCIPAL](#)).
- **password**: password for user *rootdn* (see [SECURITY CREDENTIALS](#)).
- **authenticationType**: type of authentication to be used (see [SECURITY AUTHENTICATION](#)). Use one of *none*, *simple*, *strong*. Default is *simple*.
- **version**: LDAP protocol version (see [java.naming.ldap.version](#)). Set to 3 if your server supports LDAP V3.
- **referralMode**: one of *follow*, *ignore*, *throw* (see [REFERRAL](#)).
- **serverName**: you will need to set this to *active.directory* to work with Active Directory servers. Any other value will be ignored and the service will act as on a standard LDAP.

5.3.2. Organization Service Configuration

Next, you need to configure the eXo **OrganizationService** to show how the directory is structured and how to interact with it. This is managed by a couple of init-params: **ldap.userDN.key** and **ldap.attribute.mapping** in the *ldap-configuration.xml* file (by default located at *portal.war/WEB-INF/conf/organization*)

```
<component>
<key>org.exoplatform.services.organization.OrganizationService</key>
<type>org.exoplatform.services.organization.ldap.OrganizationServiceImpl</type>
[...]
<init-params>
<value-param>
<name>ldap.userDN.key</name>
<description>The key used to compose user DN</description>
<value>cn</value>
</value-param>
<object-param>
<name>ldap.attribute.mapping</name>
<description>ldap attribute mapping</description>
<object type="org.exoplatform.services.organization.ldap.LDAPAttributeMapping"/>
[...]
</object-param>
</init-params>
[...]
</component>
```

ldap.attribute.mapping maps your LDAP to eXo. At first, there are two main parameters to configure in it:

```
<field name="baseURL">
<string>dc=exoplatform,dc=org</string>
</field>
<field name="ldapDescriptionAttr">
<string>description</string>
</field>
```

- **baseURL**: root dn for eXo organizational entities. This entry cannot be created by eXo and must have existed in the directory already.
- **ldapDescriptionAttr**: Name of a common attribute that will be used as description for groups and membership types.



Warning

In Core, the **ldapDescriptionAttr** key is present but not consistently used everywhere in code. When using **Core**, consider that the description is always mapped to the 'description' attribute.

Other parameters are discussed in the following sections.

5.3.2.1. Users

Main parameters

Here are the main parameters to map eXo users to your directory:

```
<field name="userURL">
  <string>ou=users,ou=portal,dc=exoplatform,dc=org</string>
</field>
<field name="userObjectClassFilter">
  <string>objectClass=person</string>
</field>
<field name="userLDAPClasses">
  <string>top,person,organizationalPerson,inetOrgPerson</string>
</field>
```

- **userURL**: base dn for users. Users are created in a flat structure under this base with a **dn** of the form: **ldap.userDN.key=username,userURL**.

For example:

```
uid=john,cn=People,o=MyCompany,c=com{code}
```

However, if users exist deeply under *userURL*, eXo will be able to retrieve them.

Example:

```
uid=tom,ou=France,ou=EMEA,cn=People,o=MyCompany,c=com{code}
```

- **userObjectClassFilter**: Filter used under *userURL* branch to distinguish eXo user entries from others.

Example: *john* and *tom* will be recognized as valid eXo users but *EMEA* and *France* entries will be ignored in the following subtree:

```
uid=john,cn=People,o=MyCompany,c=com
objectClass: person
...
ou=EMEA,cn=People,o=MyCompany,c=com
objectClass: organizationalUnit
...
ou=France,ou=EMEA,cn=People,o=MyCompany,c=com
objectClass: organizationalUnit
...
uid=tom,ou=EMEA,cn=People,o=MyCompany,c=com
objectClass: person
...
```

- **userLDAPClasses**: commas are used to separate list of classes used for creating users.

When a new user is created, an entry will be created with the given *objectClass* attributes. The classes must at least define *cn* and any attribute referenced in the user mapping.

For example, adding the user *Marry Simons* could produce:

```
uid=marry,cn=users,ou=portal,dc=exoplatform,dc=org
objectclass: top
objectClass: person
objectClass: organizationalPerson
objectClass: inetOrgPerson
...
```

User mapping

The following parameters maps LDAP attributes to eXo User Java objects attributes.

```
<field name="userUsernameAttr">
  <string>uid</string>
</field>
<field name="userPassword">
  <string>userPassword</string>
</field>
<field name="userFirstNameAttr">
  <string>givenName</string>
</field>
<field name="userLastNameAttr">
  <string>sn</string>
</field>
<field name="userDisplayNameAttr">
  <string>displayName</string>
</field>
<field name="userMailAttr">
  <string>mail</string>
</field>
```

- **userUsernameAttr**: username (login)
- **userPassword**: password (used when the portal authentication is done by eXo login module)
- **userFirstNameAttr**: first name
- **userLastNameAttr**: last name
- **userDisplayNameAttr**: display name
- **userMailAttr**: email address

In the example above, the user *Marry Simons* could produce:

```
uid=marry,cn=users,ou=portal,dc=exoplatform,dc=org
userPassword: XXXX
givenName: Marry
sn: Simons
displayName: Marry Simons
mail: marry.simons@example.org
uid: marry
...
```

5.3.2.2. Groups

eXo Platform groups can be mapped to organizational or applicative groups defined in your directory.

```
<field name="groupsURL">
```

```
<string>ou=groups,ou=portal,dc=exoplatform,dc=org</string>
</field>
<field name="groupLDAPClasses">
  <string>top,organizationalUnit</string>
</field>
<field name="groupObjectClassFilter">
  <string>objectClass=organizationalUnit</string>
</field>
```

- **groupsURL**: base dn for eXo groups

Groups can be structured hierarchically under *groupsURL*. For example, groups, including *communication*, *communication/marketing* and *communication/press*, would map to:

```
ou=communication,ou=groups,ou=portal,dc=exoplatform,dc=org
...
ou=marketing,ou=communication,ou=groups,ou=portal,dc=exoplatform,dc=org
...
ou=press,ou=communication,ou=groups,ou=portal,dc=exoplatform,dc=org
...
```

- **groupLDAPClasses**: commas are used to separate list of classes used for group creation.

When a new group is created, an entry will be also created with the given objectClass attributes. The classes must define at least the required attributes: **ou**, **description** and **I**.



Note

The **I** attribute corresponds to the **City** property in OU property editor.

For example, adding the *human-resources* group could produce:

```
ou=human-resources,ou=groups,ou=portal,dc=exoplatform,dc=org
objectclass: top
objectClass: organizationalunit
ou: human-resources
description: The human resources department
I: Human Resources
...
```

- **groupObjectClassFilter**: This filter is used under the *groupsURL* branch to distinguish eXo groups from other entries. You can also use a complex filter if you need.

Example: groups *WebDesign*, *WebDesign/Graphists* and *sales* could be retrieved in:

```
I=Paris,dc=sites,dc=mycompany,dc=com
...
ou=WebDesign,I=Paris,dc=sites,dc=mycompany,dc=com
...
ou=Graphists,WebDesign,I=Paris,dc=sites,dc=mycompany,dc=com
...
I=London,dc=sites,dc=mycompany,dc=com
...
ou=Sales,I=London,dc=sites,dc=mycompany,dc=com
```


...

5.3.2.3. Membership types

Membership types are the possible roles that can be assigned to users in groups.

```
<field name="membershipTypeURL">
  <string>ou=memberships,ou=portal,dc=exoplatform,dc=org</string>
</field>
<field name="membershipTypeLDAPClasses">
  <string>top,organizationalRole</string>
</field>
<field name="membershipTypeNameAttr">
  <string>cn</string>
</field>
```

- **membershipTypeURL**: base dn for membership types storage.

eXo stores membership types in a flat structure under *membershipTypeURL*. For example, roles, including *manager*, *user*, *admin* and *editor* could be defined by the subtree:

```
ou=roles,ou=portal,dc=exoplatform,dc=org
...
cn=manager,ou=roles,ou=portal,dc=exoplatform,dc=org
...
cn=user,ou=roles,ou=portal,dc=exoplatform,dc=org
...
cn=admin,ou=roles,ou=portal,dc=exoplatform,dc=org
...
cn=editor,ou=roles,ou=portal,dc=exoplatform,dc=org
...
```

- **membershipTypeLDAPClasses**: commas are used to separate list of classes for creating membership types.

When a new membership type is created, an entry will be also created with the given *objectClass* attributes. The classes must define the required attributes: **description**, **cn**.

For example, adding the membership type *validator* would produce:

```
cn=validator,ou=roles,ou=portal,dc=exoplatform,dc=org
objectclass: top
objectClass: organizationalRole
...
```

- **membershipTypeNameAttr**: Attribute will be used as the name of the role.

For example, if *membershipTypeNameAttr* is *cn*, the role name will be *manager* for the following membership type entry:

```
cn=manager,ou=roles,ou=portal,dc=exoplatform,dc=org
```

5.3.2.4. Memberships

Memberships are used to assign a role within a group. They are entries that are placed under the group entry of their scope group. Users in this role are defined as attributes of the membership entry.

- For example, to designate *tom* as the *manager* of the group *human-resources*:

```
ou=human-resources,ou=groups,ou=portal,dc=exoplatform,dc=org
...
cn=manager,ou=human-resources,ou=groups,ou=portal,dc=exoplatform,dc=org
member: uid=tom,ou=users,ou=portal,dc=exoplatform,dc=org
...
```

The parameters to configure memberships are:

```
<field name="membershipLDAPClasses">
  <string>top,groupOfNames</string>
</field>
<field name="membershipTypeMemberValue">
  <string>member</string>
</field>
<field name="membershipTypeRoleNameAttr">
  <string>cn</string>
</field>
<field name="membershipTypeObjectClassFilter">
  <string>objectClass=organizationalRole</string>
</field>
```

- **membershipLDAPClasses**: the commas are used to separate the list of classes for creating memberships.

When a new membership is created, an entry will be also created with the given *objectClass* attributes. The classes must at least define the attribute designated by *membershipTypeMemberValue*. Example: Adding membership *validator* would produce:

```
cn=validator,ou=human-resources,ou=groups,ou=portal,dc=exoplatform,dc=org
objectclass: top
objectClass: groupOfNames
...
```

- **membershipTypeMemberValue**: Multi-valued attribute is used in memberships to reference users that have the role in the group.

Values should be a user dn.

Example: *james* and *root*, who have *admin* role within the group *human-resources*, would give:

```
cn=admin,ou=human-resources,ou=groups,ou=portal,dc=exoplatform,dc=org
member: cn=james,ou=users,ou=portal,dc=exoplatform,dc=org
member: cn=root,ou=users,ou=portal,dc=exoplatform,dc=org
...
```

- **membershipTypeRoleNameAttr**: Attribute of the membership entry whose value refers to the membership type.

For example, in the following membership entry:

```
cn=manager,ou=human-resources,ou=groups,ou=portal,dc=exoplatform,dc=org
```

The *cn* attribute is used to designate the *manager* membership type. In other words, the name of role is given by the 'cn' attribute.

- **membershipTypeObjectClassFilter:** Filter is used to distinguish membership entries under groups. You can use the more complex filters.

For example, the following is a filter used for a customer that needs to trigger a dynlist overlay on OpenLDAP.

```
(&(&(objectClass=ExoMembership)(membershipURL=&#42;))
```



Note

Please pay attention to the xml escaping of the '&' (and) operator.

5.3.2.5. User profiles

eXo User profiles also have entries in the LDAP but the actual storage is still done with the hibernate service. You will need the following parameters:

```
<field name="profileURL">
  <string>ou=profiles,ou=portal,dc=exoplatform,dc=org</string>
</field>
<field name="profileLDAPClasses">
  <string>top,organizationalPerson</string>
</field>
```

- **profileURL:** base dn to store user profiles.
- **profileLDAPClasses:** Classes used for creating user profiles.

5.3.3. Active Directory sample configuration

Here is an alternative configuration for active directory that you can find in **activedirectory-configuration.xml**.

```
[...]
<component>
  <key>org.exoplatform.services.ldap.LDAPService</key>
  [...]
  <object type="org.exoplatform.services.ldap.impl.LDAPConnectionConfig">
    <!-- for multiple ldap servers, use comma separated list of host:port (Ex. ldap://127.0.0.1:389,10.0.0.1:389) -->
    <!-- whether or not to enable ssl, if ssl is used ensure that the javax.net.ssl.keyStore & java.net.ssl.keyStorePassword properties are set -->
    <!-- exo portal default installed javax.net.ssl.trustStore with file is java.home/lib/security/cacerts-->
    <!-- ldap service will check protocol, if protocol is ldaps, ssl is enable (Ex. for enable ssl: ldaps://10.0.0.3:636 ;for disable ssl: ldap://10.0.0.3:389 ) -->
    <!-- when enable ssl, ensure server name is *.directory and port (Ex. active.directory) -->
    <field name="providerURL"><string>ldaps://10.0.0.3:636</string></field>
    <field name="rootdn"><string>CN=Administrator,CN=Users,DC=exoplatform,DC=org</string></field>
    <field name="password"><string>site</string></field>
```

```

    <field name="version"><string>3</string></field>
    <field name="referralMode"><string>ignore</string></field>
    <field name="serverName"><string>active.directory</string></field>
  </object>
  [...]
</component>
<component>
  <key>org.exoplatform.services.organization.OrganizationService</key>
  [...]
  <object type="org.exoplatform.services.organization.Idap.LDAPAttributeMapping">
    [...]
    <field name="userAuthenticationAttr"><string>mail</string></field>
    <field name="userUsernameAttr"><string>sAMAccountName</string></field>
    <field name="userPassword"><string>unicodePwd</string></field>
    <field name="userLastNameAttr"><string>sn</string></field>
    <field name="userDisplayNameAttr"><string>displayName</string></field>
    <field name="userMailAttr"><string>mail</string></field>
    [...]
    <field name="membershipTypeLDAPClasses"><string>top.group</string></field>
    <field name="membershipTypeObjectClassFilter"><string>objectClass=group</string></field>
    [...]
    <field name="membershipLDAPClasses"><string>top.group</string></field>
    <field name="membershipObjectClassFilter"><string>objectClass=group</string></field>
  </object>
  [...]
</component>

```



Note

There is a Microsoft limitation: the password cannot be set in AD via unsecured connection, you have to use the LDAPs protocol.

Here is how to use the LDAPs protocol with the Active Directory:

1. Set up AD to use SSL:

- i. Add the Active Directory Certificate Services role.
- ii. Install the right certificate for the DC machine.

2. Enable Java VM to use the certificate from AD:

- i. Import the root CA used in AD, to keystore, such as: `keytool importcert -file 2008.cer -keypass changeit -keystore /home/user/java/jdk1.6/jre/lib/security/cacerts`.

- ii. Set the Java options as below:

```
JAVA_OPTS="{JAVA_OPTS} -Djavax.net.ssl.trustStorePassword=changeit -Djavax.net.ssl.trustStore=/home/user/java/jdk1.6/jre/lib/security/ca"
```

5.3.4. Picketlink IDM

eXo Platform uses the PicketLink IDM component to keep the necessary identity information, such as users, groups, memberships. While the legacy interfaces are still used (`org.exoplatform.services.organization`) for the identity management, there is a wrapper implementation that delegates to the PicketLink IDM framework. For further information, visit [here](#).

The project `exo.core` defines the API for Organization Service and the eXo Platform implementation of API. For the Organization Service plugged in the eXo Platform product, you are flexible in switching between: eXo Organization Service, PicketLink and your own implementation. The configuration to switch between various Organization Service implementations can be found in `portal.war/WEB-INF/conf/configuration.xml`:

```
<!--PicketLink IDM integration -->
```

```
<import>war:/conf/organization/idm-configuration.xml</import>

<!--Former exo implementations -->
<!--<import>war:/conf/organization/exo/hibernate-configuration.xml</import> -->
<!-- <import>war:/conf/organization/exo/jdbc-configuration.xml</import> -->
<!--for organization service used active directory which is user lookup server -->
<!-- <import>war:/conf/organization/exoactivedirectory-configuration.xml</import> -->
<!--for organization service used ldap server which is user lookup server -->
<!-- <import>war:/conf/ldap-configuration.xml</import> -->
```

If you want to switch between different implementations, you just need to uncomment the corresponding `<import>` and leave others commented:

```
<!--PicketLink IDM integration -->
<import>war:/conf/ldap-configuration.xml</import>
<!-- <import>war:/conf/organization/idm-configuration.xml</import> -->
<!--Former exo implementations -->
<!--<import>war:/conf/organization/exo/hibernate-configuration.xml</import> -->
<!-- <import>war:/conf/organization/exo/jdbc-configuration.xml</import> -->
<!--for organization service used active directory which is user lookup server -->
<!-- <import>war:/conf/organization/exoactivedirectory-configuration.xml</import> -->
<!--for organization service used ldap server which is user lookup server -->
```

5.4. Email

The email service can use any SMTP account configured in `$JBOSS_HOME/server/default/conf/gatein/configuration.properties` or `$TOMCAT_HOME/gatein/conf/configuration.properties` if you are using Tomcat.

The relevant section looks like:

```
# EMail
gatein.email.smtp.username=
gatein.email.smtp.password=
gatein.email.smtp.host=smtp.gmail.com
gatein.email.smtp.port=465
gatein.email.smtp.starttls.enable=true
gatein.email.smtp.auth=true
gatein.email.smtp.socketFactory.port=465
gatein.email.smtp.socketFactory.class=javax.net.ssl.SSLSocketFactory
```

It is pre-configured for Gmail, so any Gmail account can easily be used. You simply need to use the full Gmail address as username, and fill in the password.

In corporate environments, you will want to use your corporate SMTP gateway. When using it over SSL, like in the default configuration, you may need to configure a certificate trust-store, containing your SMTP server's public certificate. Depending on the key sizes, you might also need to install Java Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy Files for your Java Runtime Environment.























eXo Platform 3.5 APIs

This chapter presents the information about APIs that help you build your own applications from eXo services via the following topics:

- [Definitions of API Levels](#)
 - [Use Provisional or Experimental APIs \[105\]](#)
- [Platform APIs](#)
 - [Java APIs](#)
 - [JavaScript APIs](#)
 - [Web Services](#)
- [Provisional APIs](#)
 - [Java APIs \[107\]](#)

6.1. Definitions of API Levels

APIs vary according to the maturity level. It is important to understand the eXo Platform's general approach to the API change management. The different levels of APIs are described in the following table:

API Level	Test Suite	Clients	Documentation	Support	Compatibility X.Y.Z(+1)	Compatibility X.Y(+1)
Platform API						
Provisional API						
Experimental API				Best effort	Best effort	
Unsupported API						

Test Suite: A suite of tests that can be run against the API to detect changes.

Clients: The API has been used successfully by at least 2 different teams, using the API Documentation only.

Documentation: The API has a clean JavaDoc and reference documentation.

Support: The eXo Support team provides help on the code that uses this API, and fixes any reported bugs.

Compatibility X.Y.Z(+1): The compatibility between maintenance versions (X.Y.Z and X.Y.Z+1) is guaranteed. If there is any change between X.Y and X.Y+1, the eXo Support team will help by upgrading the code.

Compatibility X.Y(+1): The compatibility between minor versions (X.Y and X.Y+1) is guaranteed. If there is any change between X and X+1, the eXo Support team will help by upgrading the code.

Best Effort: You will receive assistance, but eXo Platform cannot guarantee any specific result.

Use Provisional or Experimental APIs

These APIs are provided to give an "early look" at which will be available in upcoming versions of eXo Platform. These APIs are not final, but they can be used to start developing your application.

Provisional APIs are APIs close to being frozen, but that need a last look from users. They can be used by third-party developers for their own apps, with the knowledge that only a limited compatibility guarantee is offered.

Experimental APIs are APIs that are likely to change. They are published to get feedback from the community. These APIs have been tested successfully, but have not yet had enough feedback from developers.

6.2. Platform APIs

6.2.1. Java APIs

Portlet API: (JSR 168 and JSR 286) A Java standard that defines how to write portlets. This is the way to develop Java applications that are integrated into eXo Platform.

WSRP 1.0 on JBoss: A network protocol for integrating remote portlets into eXo Platform.

JAX-RS: (JSR 311) A standard API that provides support for creating REST-like services.

JCR (JSR 170): A standard API that provides access to a content repository.

JCR Service Extensions: A set of APIs that provide extended functionalities for the JCR, such as observation, permissions, and access to a repository.

Java EE 6: eXo Platform supports the Java EE 5 APIs, so you can develop applications using this standard.

Cache: An API used for data caching.

Event and Listener: An API for listening and sending events within eXo Platform.

Organization: An API and SPI for accessing user, group and membership information.

Portal Container Definition: This API is used to configure your portal.

Taxonomy: An API that allows you to organize your content.

LinkManager: An API that provides a way to manage links when developing WCM features.

PublicationManager: An API that provides different ways to manage the publication of content when developing WCM features.

WCMComposer: An API to get content shown in the website. The cache management is used in this service, and methods to update the content cache.

NewFolksonomy:

ApplicationTemplateManager: An API to manage dynamic groovy templates for WCM-based products.

NodeFinder: An API to find a node with a given path.

JodConverter: An API to convert documents into different office formats.

SiteSearchService: An API that allows users to find all information matching with their given keyword.

SEOService: An API that manages SEO data of a page or a content.

TimelineService: An API that allows documents to be displayed by days, months and years.

XML Configuration: A set of DTD for configuring eXo Platform.

ActivityManager: An API to manage activities (create/delete/like activity; delete/like/create comment; get activities of space/user/connection).

IdentityManager: An API to manage identities (create identity, save profile, get connection of an identity).

RelationshipManager: An API which is used to work with connections between 2 identities, interact between identities, get list access to get list of connections, incomings, outgoings.

SpaceService: An API that provides methods for working with space (create new space, delete, get space by url, groupid, display name, pretty name).

6.2.2. JavaScript APIs

OpenSocial 1.1 Gadget Specification: A standard that defines how to write gadgets and provide APIs. Gadgets are particularly useful for integrating external applications into eXo Platform.

6.2.3. Web Services

CMIS: A standard API that gives access to the content repository via REST and SOAP Web services.

FTP: A standard protocol for exchanging documents.

OpenSocial 1.1 REST Protocol: A standard API for accessing the social graph and activity streams.

WebDAV: A standard protocol for exchanging document over HTTP.

6.3. Provisional APIs

Java APIs

UI Extensions: An API to plug new actions into the eXo Platform UI.

DocumentExplorer Toolbar

ECM Admin

Activity Sharing

Cookbook

This chapter currently focuses on how to copy a work done on the eXo Platform server, such as creating navigations, node types and templates, to another eXo Platform servers through these topics:

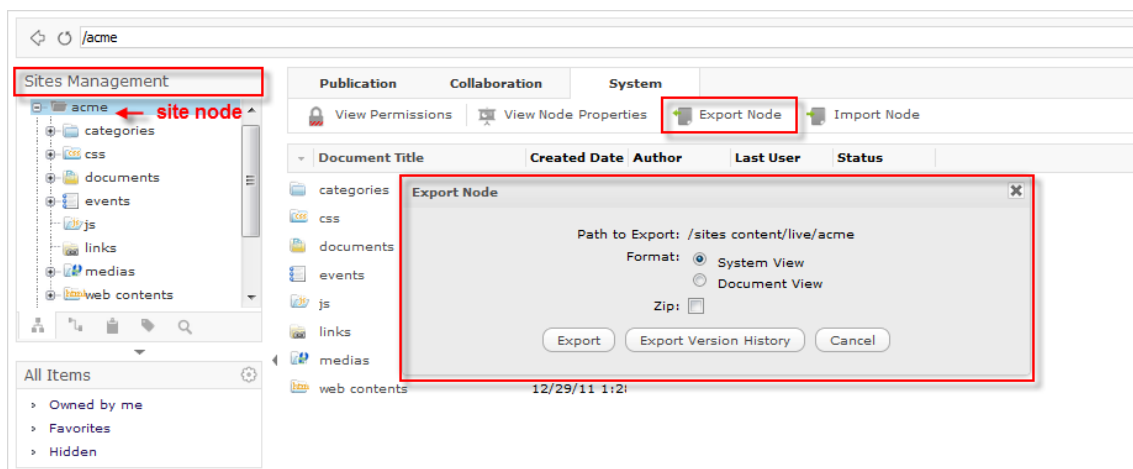
- [Copy a site's content folder with its version history \[109\]](#)
- [Copy navigation nodes of sites \[110\]](#)
- [Copy templates of node types templates \[111\]](#)
- [Copy the WCM template \[113\]](#)
- [Copy a Taxonomy tree \[114\]](#)
- [Copy metadata templates \[116\]](#)
- [Copy queries \[116\]](#)
- [Copy scripts \[116\]](#)
- [Copy drive configurations \[116\]](#)
- [Copy gadgets \[116\]](#)
- [Restart the server \[117\]](#)

7.1. How to Copy a Site

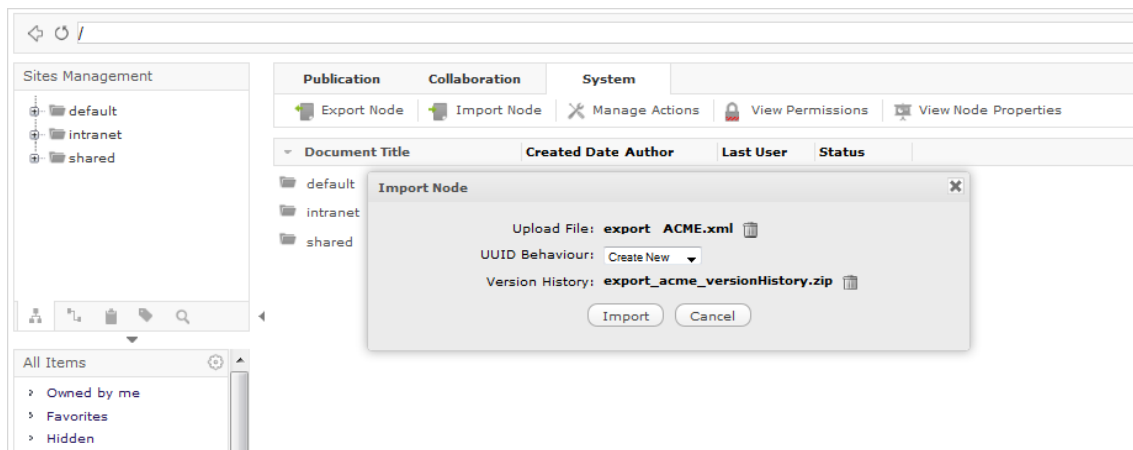
The procedure of each step will be detailed as follows:

Step 1. Copy a site's content folder with its version history.

1. Go to the **Sites Management** drive.
2. Open the site node, for example "acme".
3. Click **Export Node** to export the node with its version history as below:



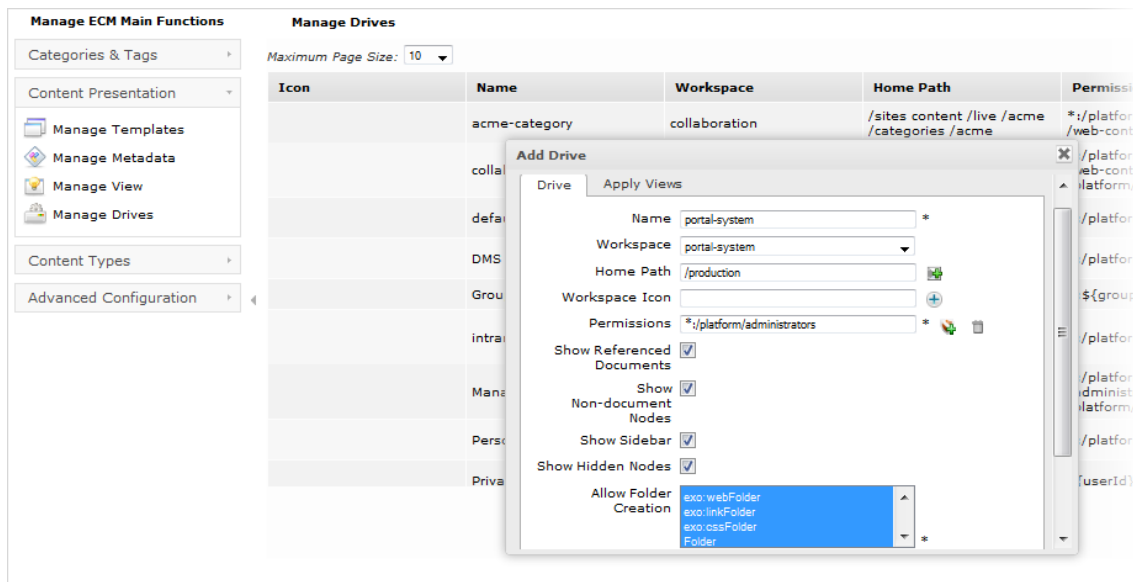
4. Select **Export** and **Export Version History** to perform the exporting.
5. Navigate to the node where you want to import the file, then click **Import Node** to open the **Import Node** form.
6. Select the exported nodes and version history to be imported.



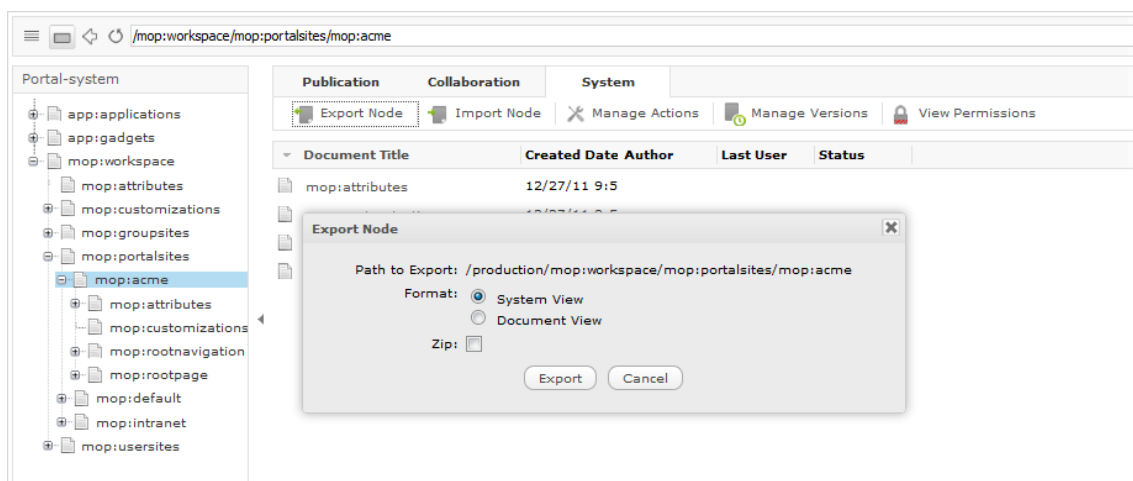
One pop-up message will appear to inform that you have imported successfully.

Step 2. Copy navigation nodes of sites.

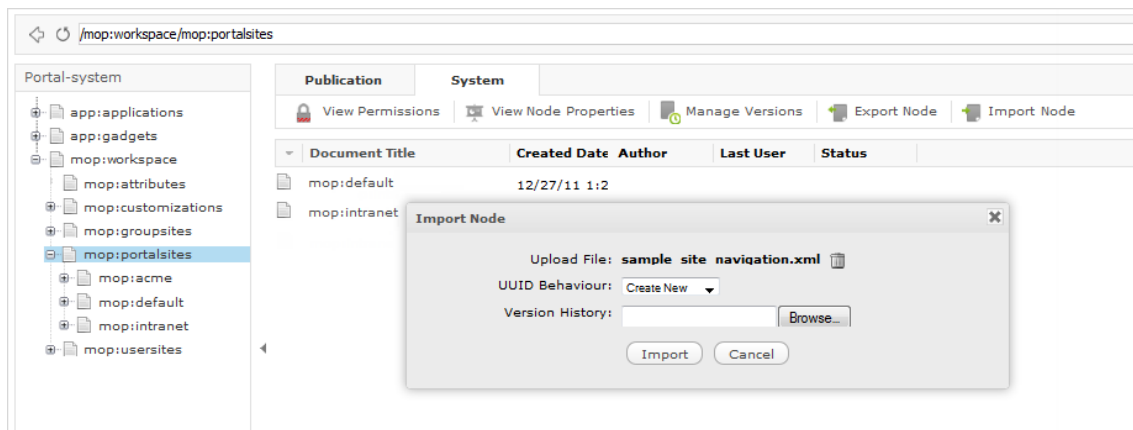
1. Go to the **Content Administration** page and add a new drive to both target and source servers.



2. Export the navigation node.

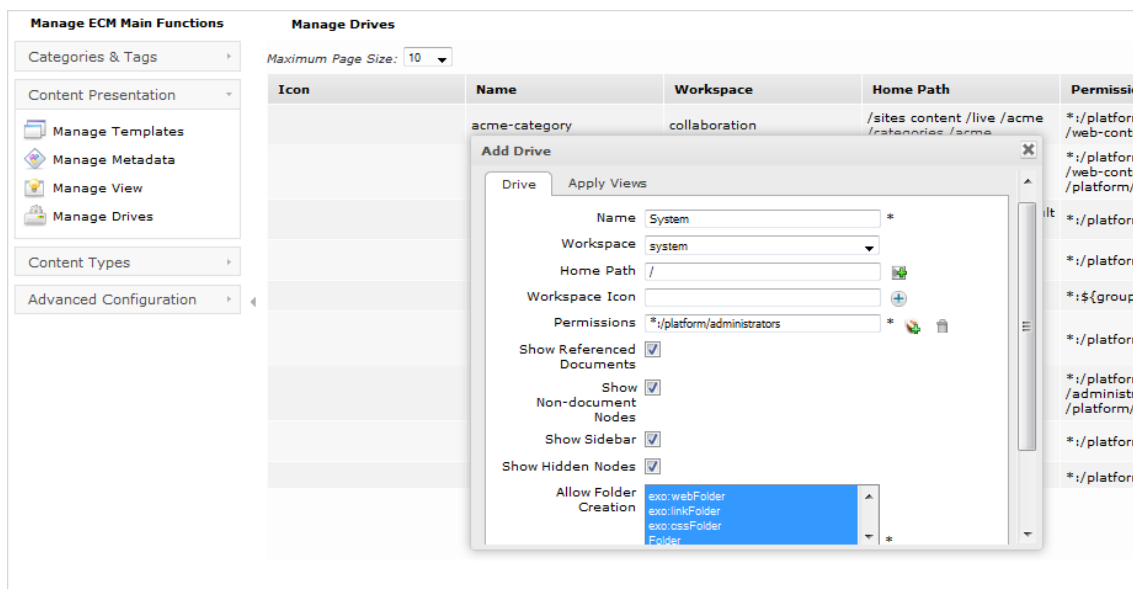


3. Import the nodes navigation.

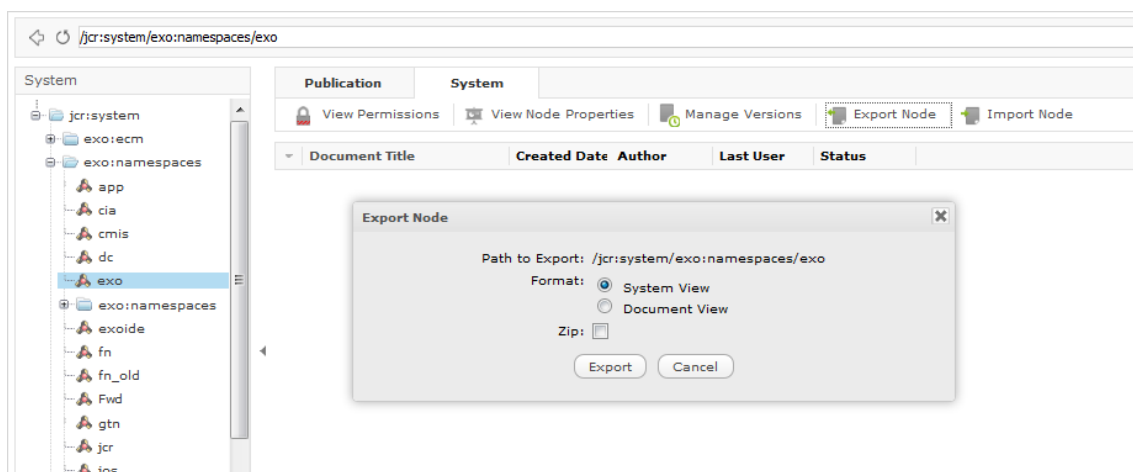


Step 3. Copy templates of node types.

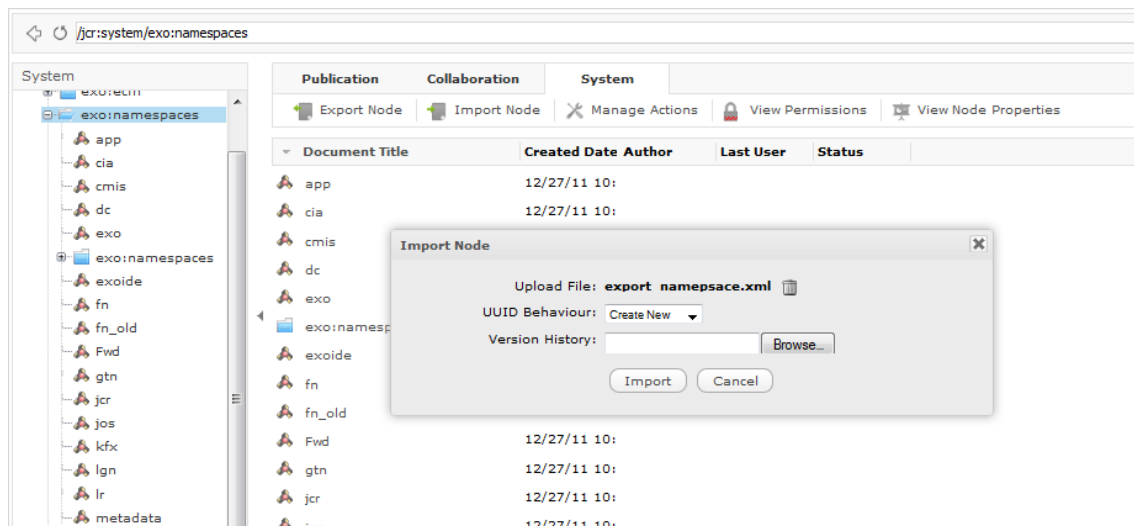
1. Add the **System** drive to both servers.



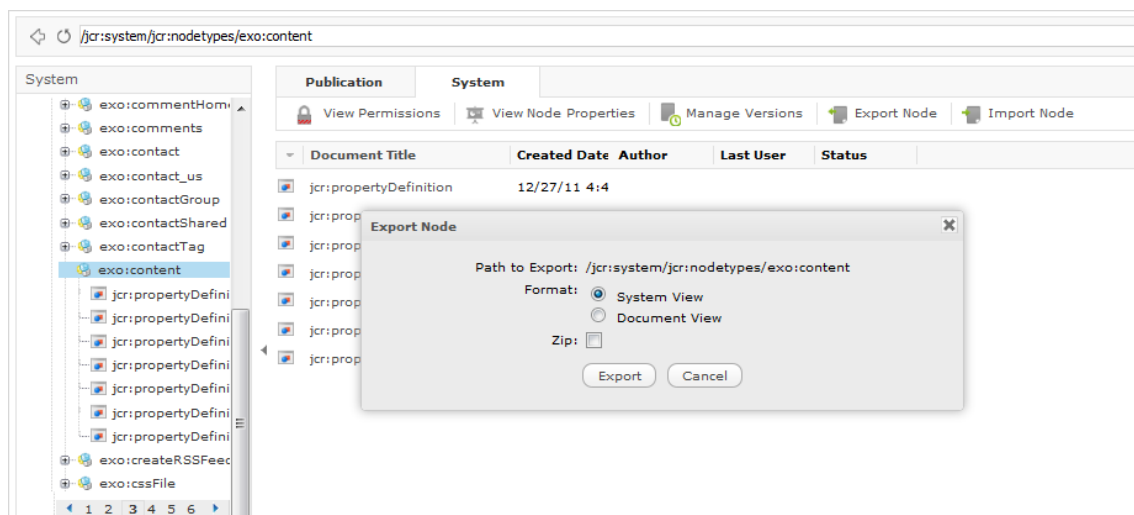
2. Open `system:/jcr:system/exo:namespaces/{namespace_name}`, and export it.



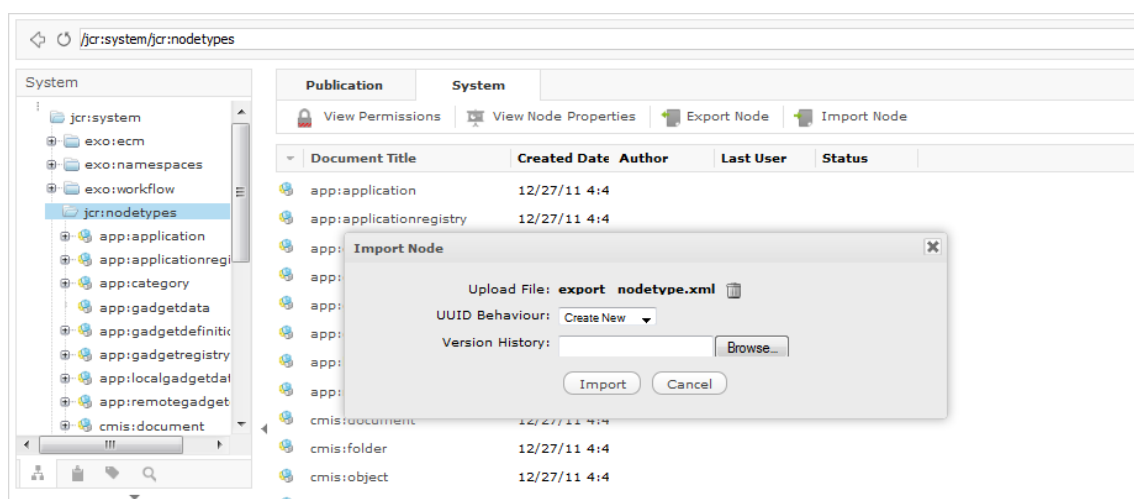
3. Open `system:/jcr:system/exo:namespaces/`, and import the exported file as described in [Step 2 \[110\]](#).



4. Open `system:/jcr:system/jcr:nodetypes/{node_type}`, and export it.



5. Open `system:/jcr:system/jcr:nodetypes/`, and import the exported file as described in [Step 4](#) [113].



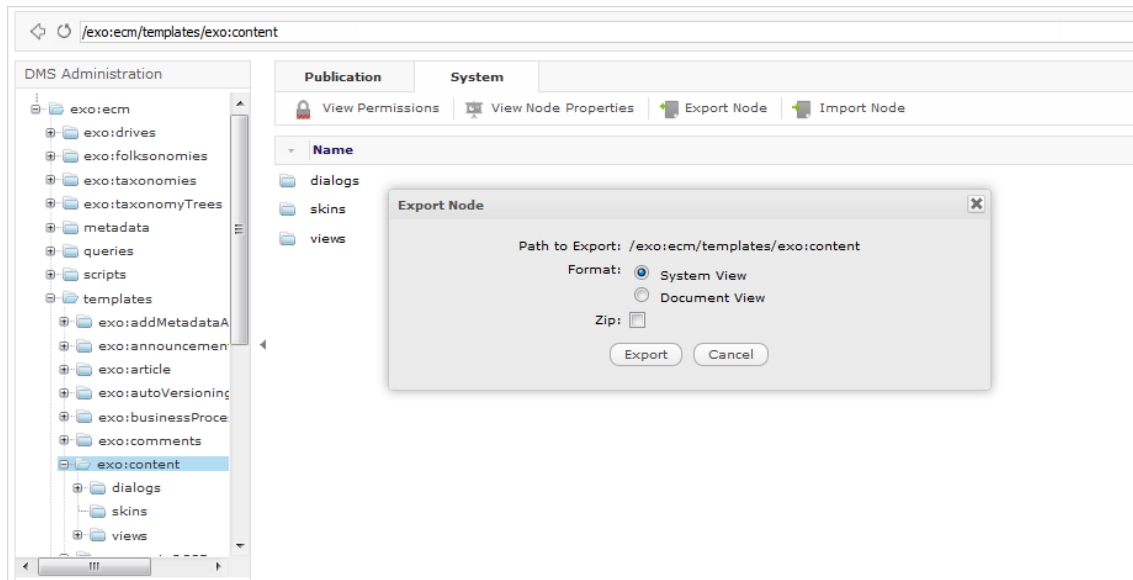


Note

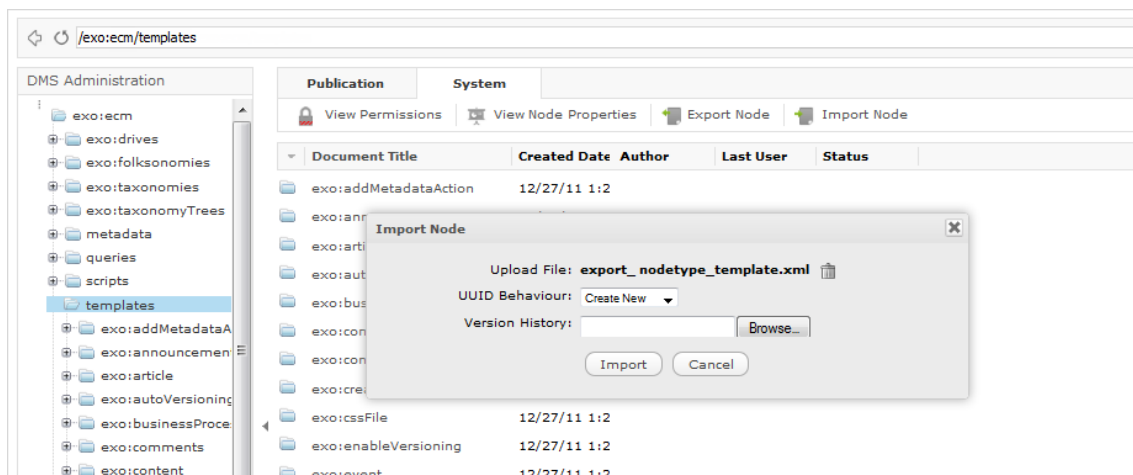
If you have some specific JCR namespaces and node types, you need to import them into the new server.

Step 4. Copy the WCM template.

1. Open the **DMS Administration** drive.
2. Open `dms-system:/exo:ecm/templates/{node_type}`, and export it.



3. Open `dms-system:/exo:ecm/templates/`, and import the exported file.

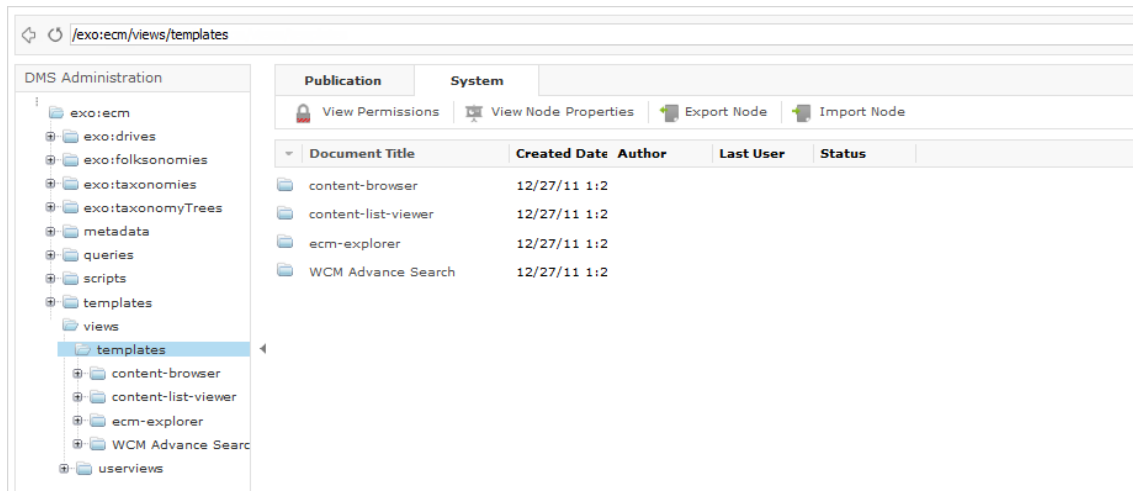


Also, for the CLV/PCLV templates, you can find all template views defined in the `dms-system:/exo:ecm/views` path with:

- **userviews**: this folder contains views of Sites Explorer with a set of actions.
- **templates**: where you can find all gtmpl templates of:
 - Category Navigation Portlet templates.
 - Content List Viewer (CLV) templates and its paginator templates.
 - content-browser templates (Deprecated Portlet).

- ecm-explorer templates define how to display nodes in the Sites Explorer portlet, such as CoverFlow template, IconView template.
- Parameterized Content List Viewer (PCLV) templates and its paginator templates.
- **WCM Advanced Search** is used in the **WCM Search** portlet to define the form, layout, result and result's paginator.

If you want to reuse one of the non-predefined templates above, simply export and import it into the new server at the same place.



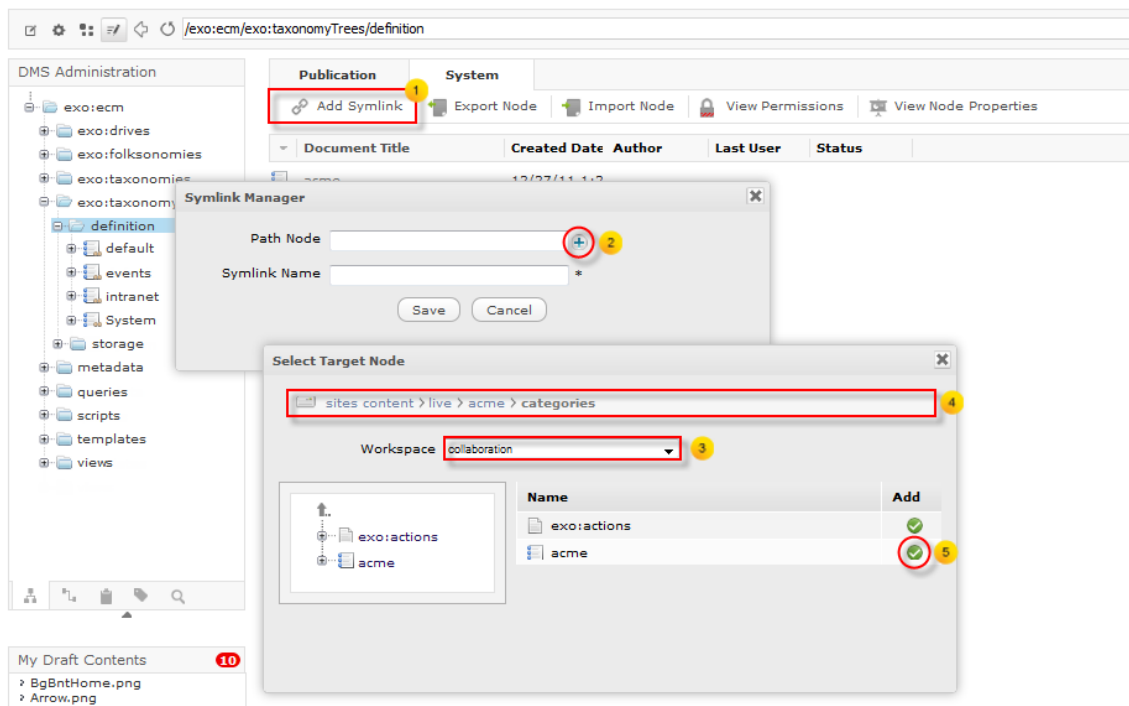
Note

If you have some specific WCM (CLV/PCLV) views and/or templates of node types, you will need to import them into the new server.

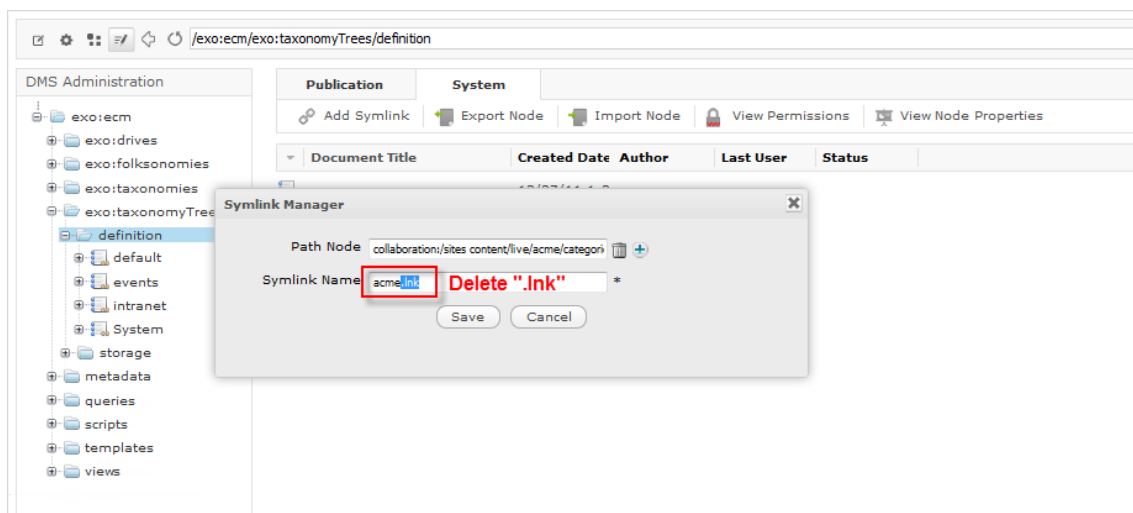
Step 5. Copy a Taxonomy tree.

By importing the whole site as described in the [Copy a site's content folder with its version history \[109\]](#) section, you will also have the Taxonomy tree imported. The default location where the site's Taxonomy is placed in a sub-folder is named **category**. So, you do not need to export or import them because this step is automatically done. But the Taxonomy tree definition is still not fully imported in the new server. What you need to do is to add this Taxonomy tree definition by following these steps:

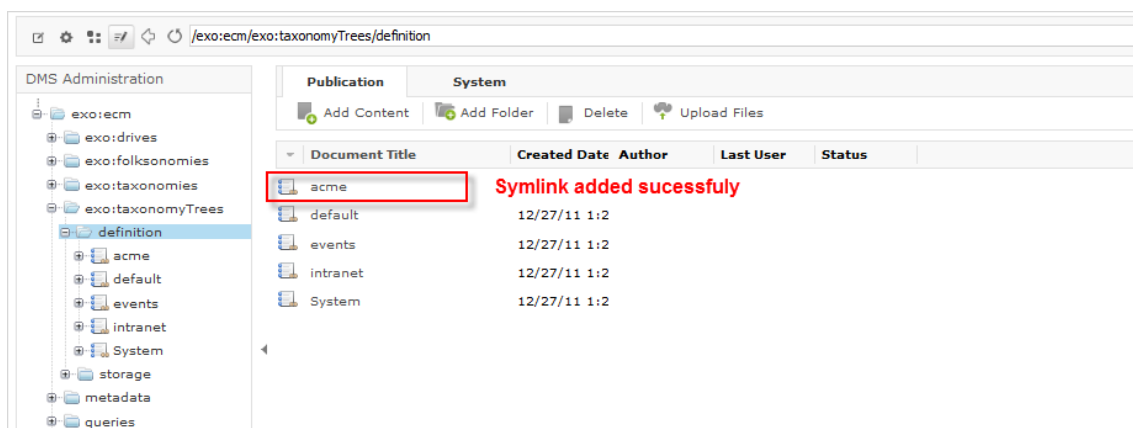
1. Open the **DMS Administration** drive in the new server.
2. Go to `dms-system:/exo:ecm/exo:taxonomyTrees/definition/`.
3. Add a symlink to the **Taxonomy Tree Root Node**, for example `collaboration:/sites content/live/acme/categories/acme`.



The name of symlink is displayed as "acme".



The symlink will be generated as below:



In some cases, to see changes, you need to clear the cache by disconnecting or restarting the server.

Manage ECM Main Functions

Categories & Tags

Manage Categories











Manage Tags

Content Presentation

Content Types

Advanced Configuration

Manage Categories

Name	Workspace	Home Path	Permissions	Action
System	dms-system	/exo:ecm /exo:taxonomyTrees /storage /System	...erty;__system remove	 
intranet	collaboration	/sites content /live /intranet /categories /intranet	...erty;__system remove	 
events	collaboration	/sites content /live /acme /events	...erty;__system remove	 
default	collaboration	/sites content /live /default /categories /default	...erty;__system remove	 
acme	collaboration	/sites content /live /acme /categories /acme	...erty;__system remove	 

Add Category Tree

Step 6. Copy metadata templates.

1. Open the **DMS Administration** drive in the new server.
2. Go to `/exo:ecm/metadata/{meta_data_name}`.
3. Export and import it in the same location in the new server again.

Step 7. Copy queries.

1. Open the **DMS Administration** drive in the new server.
2. Go to `/exo:ecm/queries/{query_name}`.
3. Export and import it in the same location in the new server again.

Step 8. Copy scripts.

1. Open the **DMS Administration** drive in the new server.
2. Go to `/exo:ecm/scripts/ecm-explorer`.

You will find three folders referring to the three types of groovy scripts in eXo Platform, including:

- action: The action scripts are launched when an ECM action triggers them. For more information, refer to **Actions Concept**.
- interceptor: Interceptor scripts are triggered before and/or after the JCR node is saved, or when a node is created or edited. They are used to either validate the value entered in a form or to manipulate the newly created node, for example, to map the new node with a forum thread or any other type of discussion areas.
- widget: Widget scripts are used to fill widgets, such as a select box in a dynamic way.

3. Export your customized script in the same location in the new server.

Step 9. Copy drive configurations.

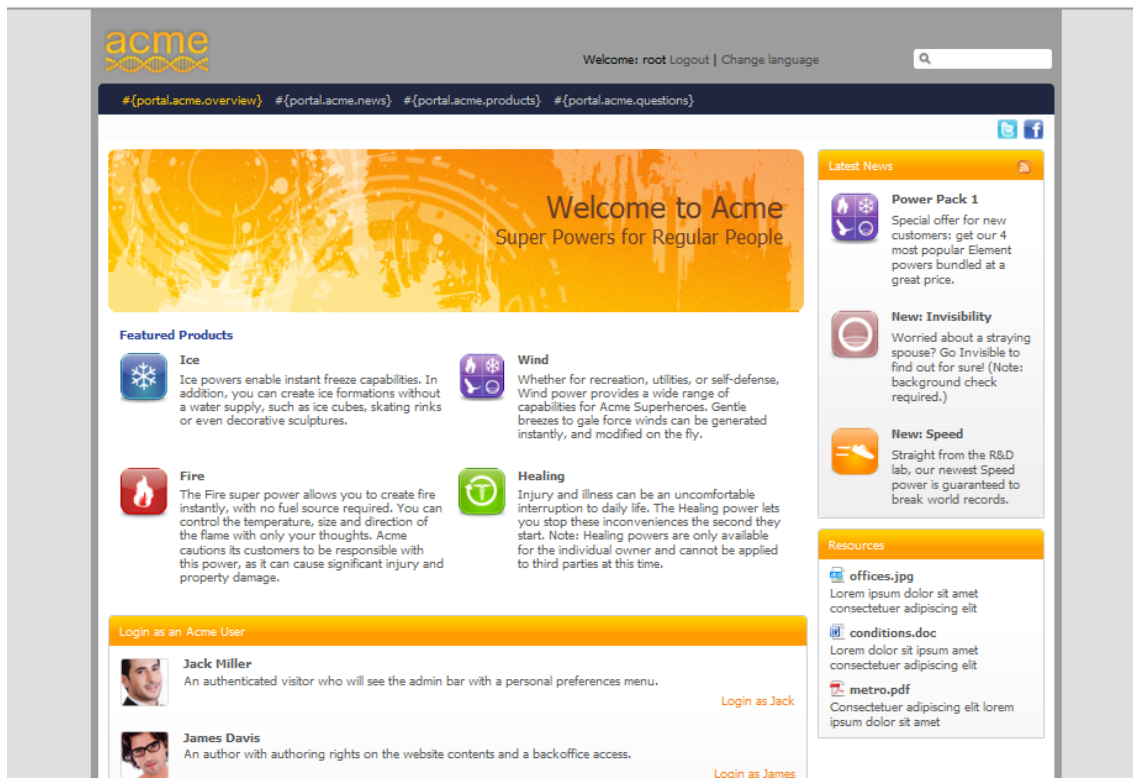
1. Open the **DMS Administration** drive in the new server.
2. Go to `/exo:ecm/exo:drives/{drive_name}`.
3. Export and import it in the same location in the new server again.

Step 10. Copy gadgets.

1. Open the drive that points into the **Portal-System** Workspace.
2. Go to your gadget by following the `portal-system:/production/app:gadgets/{gadget_name}` path.
3. Export and import it in the same location in the new server again.

Step 11. Restart the server.

After importing the site navigation nodes, the site may look quite broken, so you need to restart the server first. After the server is restarted, the site will look like:



Upgrade eXo Platform

Upgrading eXo Platform from 3.0 to 3.5 is generally a procedure which includes 2 steps:

Step 1. Upgrade the project extensions.

Step 2. Upgrade the project and the product data.

This chapter aims at instructing you how to archive [Step 1 \[119\]](#) via the following topics:

- [Prerequisites](#)
- [Prepare your extension project](#)
- [What needs to be adapted in eXo Platform extension](#)
- [Update project Maven dependencies](#)
- [Update configurations](#)
- [Update components](#)
- [Update extension](#)



Note

Upgrading data can be strongly dependent on both your deployments and environments, so it is recommended that you contact <http://support.exoplatform.com> to bootstrap the [Step 2 \[119\]](#).

8.1. Prerequisites

Before upgrading, you first need to understand how to create a project which is based on eXo Platform 3.5. For more details, refer to [Create Your Own Portal](#).

And now, you need to gather all requirements for your upgraded project by clarifying the following questions:

- Do you actually need to migrate your project sources?
- Have you created any new portal containers in your system?
- Have you made any lifetime-related changes on eXo Platform? Would you like to keep these changes?
- Have you developed a custom application? Where have you stored your application data?
- Have you configured a dedicated JCR workspace?
- Which eXo APIs are you using in your code?
- Have you overridden any files of eXo Platform?
- Have you disabled any services of eXo Platform?
- Which Kernel configurations have you customized?

8.2. Prepare your extension project

You need to create a new branch for eXo Platform 3.5 extension project, then clone your source code of eXo Platform 3.0 with that of eXo Platform 3.5.

The way to package your project customization called extensions has been introduced in eXo Platform 3.0. Therefore, by using the WAR extension configuration approach, you can overload eXo Platform's default files defined in WARs, such as *gtmpl*, *favicon*, *xml*, *jsp*. For more details on how to create your extension project, refer to the [Create Your Own Portal](#) section.

Because there are not any changes on the eXo Platform 3.5 extension mechanism, your extensions should be mostly compatible. However, if your extension was overriding either of the eXo Platform 3.0 built-in files, you should check that the file has not been changed in eXo Platform 3.5 and update it if any.

8.3. What needs to be adapted in eXo Platform extension

There are 4 main steps which need to be defined for updating eXo Platform extension from 3.0 to 3.5:

- Update your project Maven dependencies in the *POM* files.
- Update your eXo Platform 3.5 configurations.
- Update components in your eXo Platform extension to use components of Platform 3.5
- Update your eXo Platform extension which are customised features/components (were added new/ modified/ delete in eXo Platform 3.0 extension), and make sure they can work well in eXo Platform 3.5 environment.

8.4. Update project Maven dependencies

eXo Platform include many components, so if you want to update your eXo Platform extension to use eXo Platform 3.5, you need to update all dependencies version in the *POM* files, and select dependencies version which are compatible with the eXo Platform 3.5. For example, eXo Platform 3.5.1 needs to have the following main dependencies:

```
<!-- kernel -->
<dependency>
  <groupId>org.exoplatform.kernel</groupId>
  <artifactId>kernel-parent</artifactId>
  <version>2.3.5-GA</version>
</dependency>
<!-- core -->
<dependency>
  <groupId>org.exoplatform.core</groupId>
  <artifactId>core-parent</artifactId>
  <version>2.4.5-GA</version>
</dependency>
<!-- ws -->
<dependency>
  <groupId>org.exoplatform.ws</groupId>
  <artifactId>ws-parent</artifactId>
  <version>2.2.5-GA</version>
</dependency>

<!-- jcr -->
<dependency>
  <groupId>org.exoplatform.jcr</groupId>
  <artifactId>jcr-parent</artifactId>
  <version>1.14.5-GA</version>
</dependency>

<!-- jcr service -->
<dependency>
  <groupId>org.exoplatform</groupId>
  <artifactId>exo-jcr-services</artifactId>
  <version>1.14.5-GA</version>
</dependency>

<!-- commons -->
<dependency>
  <groupId>org.exoplatform.common</groupId>
  <artifactId>exo.platform.common</artifactId>
  <version>1.1.5</version>
```

```

</dependency>

<!-- exogtn -->
<dependency>
  <groupId>org.exoplatform.portal</groupId>
  <artifactId>exo.portal.parent</artifactId>
  <version>3.2.2-PLF</version>
</dependency>

<!-- webos -->
<dependency>
  <groupId>org.exoplatform.webos</groupId>
  <artifactId>webos-parent</artifactId>
  <version>2.0.2</version>
</dependency>

<!-- ecms -->
<dependency>
  <groupId>org.exoplatform.ecms</groupId>
  <artifactId>exo-ecms</artifactId>
  <version>2.3.5</version>
</dependency>

<!-- ide -->
<dependency>
  <groupId>org.exoplatform.ide</groupId>
  <artifactId>exo-ide-parent</artifactId>
  <version>1.1.4</version>
</dependency>

<!-- cs -->
<dependency>
  <groupId>org.exoplatform.cs</groupId>
  <artifactId>cs</artifactId>
  <version>2.2.7</version>
</dependency>

<!-- ks -->
<dependency>
  <groupId>org.exoplatform.ks</groupId>
  <artifactId>ks</artifactId>
  <version>2.2.7</version>
</dependency>

<!-- social -->
<dependency>
  <groupId>org.exoplatform.social</groupId>
  <artifactId>social-project</artifactId>
  <version>1.2.7</version>
</dependency>

<!-- integration -->
<dependency>
  <groupId>org.exoplatform.integration</groupId>
  <artifactId>integ</artifactId>
  <version>1.0.5</version>
</dependency>

```

8.5. Update configurations

After updating Maven dependencies, you need to update configurations via answering two questions:

- In your eXo Platform extension, did you override anything in `$PLATFORM-TOMCAT-HOME/gatein/conf`?
 - If NO, you can skip this step, and simply keep all configurations in `$PLATFORM-TOMCAT-HOME/gatein/conf`.
 - If YES, you first need to keep all configurations of eXo Platform 3.5, then define which configurations you want to add/remove/update.

After that, you can put them into `$PLATFORM-TOMCAT-HOME/gatein/conf`.

**Note**

There are some new configurations in `$PLATFORM-TOMCAT-HOME/gatein/conf/` which are related to [how to deploy the eXo Platform clustering](#), and [JBoss Cache configuration](#).

- In your eXo Platform extension, did you override anything in `$PLATFORM-TOMCAT-HOME/bin/`
- If NO, you can skip this step, and simply keep all configurations in `$PLATFORM-TOMCAT-HOME/bin/`.
- If YES, you first need to keep all eXo Platform 3.5's origin configurations, then add/remove/update your extension configuration into it.

**Note**

`$PLATFORM-TOMCAT-HOME/bin/gatein.sh` and `$PLATFORM-TOMCAT-HOME/bin/gatein.bat` are no longer used. Therefore, you should add your customized configurations in a more official way to set environment variables via `setenv.sh` or `setenv.bat`.

8.6. Update components

There are many components in eXo Platform, so if you update your eXo Platform extension to eXo Platform 3.5, you need to update the version of all eXo Platform 3.5's components. To do so, simply configure the Maven POM file that allows you to use the artifacts (eXo Platform 3.5 and its components). For more details, see the [Update project Maven dependencies](#) section. All eXo Platform 3.5's components will be automatically included in your eXo Platform extension.

There are some new components in eXo Platform 3.5 that have not been existing in eXo Platform 3.0, including Webos, Wiki, and Gadget-pack. To use these components, simply activate their profiles. For more details, see the [Profiles of eXo Platform](#) section.

In eXo Platform 3.5, the "intranet" portal is defined in the `acme-intranet.war` file (not in the `office-portal.war` file of eXo Platform 3.0). So if you have overridden anything in the "intranet" portal, you need to synchronize your extension with the `acme-intranet.war` file of eXo Platform-3.5.

8.7. Update extension

This section details how to update your custom eXo Platform extension, including updating [Kernel XML Schema](#), [portal](#) and [APIs](#).

8.7.1. Update Kernel XML Schema

- Simply upgrade the version from `kernel_1_0.xsd` to `kernel_1_2.xsd` in all `.xml` configurations files.

```
<configuration xmlns="http://www.exoplatform.org/xml/ns/kernel_1_2.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.exoplatform.org/xml/ns/kernel_1_2.xsd http://www.exoplatform.org/xml/ns/kernel_1_2.xsd">
.....
</configuration>
```


8.7.2. Update portal

8.7.2.1. Portal data import



Note

It is recommended you have the knowledge of the import mechanism by referring to the [Data Import Strategy](#) section.

Processing the portal data import includes the following tasks:

- Improve the current data import strategy so that it becomes more flexible in various scenarios.
- Deploy an extension after you have initialized the portal that allows the extension to contribute its entities to an existing site.
- Reimport data by overwriting an existing entire configuration at each startup.

What's new?

Previous behavior	New behavior
<p>The previous mode for navigations is defined using the overridden configuration.</p> <ul style="list-style-type: none"> • Merge: Merge data from the XML descriptor to the existing data. • Override: Destroy any existing data, and create new ones. <p>The previous mode has two main issues:</p> <ul style="list-style-type: none"> • The behavior for instance disables the "always merge data" usecase. It means that it is always impossible to merge new navigations nodes from XML to MOP. • The behavior is configured by the overridden parameter. 	<p>The new behavior which is configured at the import level with a field parameter would have the following values:</p> <ul style="list-style-type: none"> • conserve: Import data. However, if the navigation has been existing, it will be kept. • insert: Insert the missing descriptor data by adding new nodes without any modifications on the existing nodes. • merge: Merge the descriptor data, add missing nodes and update the nodes of the same name. • overwrite: Always destroy the previous data and create new ones.

For example, if you want to merge the new portal navigation from the configuration file and the existing portal navigation into the current eXo Platform, you can configure as below:

```
<object-param>
  <name>portal.configuration</name>
  <object type="org.exoplatform.portal.config.NewPortalConfig">
    <field name="predefinedOwner">
      <collection type="java.util.HashSet">
        <value><string>classic</string></value>
      </collection>
    </field>
    <field name="ownerType">
      <string>portal</string>
    </field>
    <field name="templateLocation">
      <string>war:/conf/portal</string>
    </field>
    <field name="importMode">
      <string>merge</string>
    </field>
  </object>
```

</object-param>

**Note**

When a mode is not specified, the default mode will be **conserve**.

8.7.2.2. Authentication

eXo Platform 3.5 uses a new authentication mechanism so-called the WCI authentication mechanism. This change from GateIn into the WCI module is because:

- Authentication is commonly part of Java EE and happens at the Servlet Container layer, while WCI is the layer of integration between our stack and the Servlet Container.
- WCI provides an easier integration of SSO providers that allows the SSO module to depend on the WCI module instead of integrating directly with the GateIn module. Its main benefit is to improve the quality of SSO and to decouple SSO from GateIn.
- The GateIn stack wants to support and leverage specifications of both Servlet 3.0 and Servlet 2.5 that are not supported by the GateIn module. Meanwhile, WCI can serve both.
- The Servlet 3.0 provides a programmatic login feature which can be used to implement WCI.
- WCI provides the stronger guaranty of the authentication quality, meanwhile the authentication of GateIn was not unit tested. By moving the GateIn to WCI module, the test can be made against several implementations.

If there are other new portal containers in your eXo Platform extension, you need to update the authentication mechanism in the `$PLATFORM-TOMCAT-HOME/conf/jaas.conf` file. For example, in case you have added a new portal container named "company" to eXo Platform, you need to configure the new authentication module for the new portal container as follows:

```
<!--this configuration for default portal container with name "portal"-->
gatein-domain {
    org.gatein.wci.security.WCILoginModule optional;
    org.exoplatform.services.security.jaas.SharedStateLoginModule required;
    org.exoplatform.services.security.j2ee.TomcatLoginModule required;
};

<!--this configuration for new portal container with name "company"-->
gatein-domain-company {
    org.gatein.wci.security.WCILoginModule optional
    portalContainerName="company"
    realmName="gatein-domain-company";
    org.exoplatform.services.security.jaas.SharedStateLoginModule required
    portalContainerName="company"
    realmName="gatein-domain-company";
    org.exoplatform.services.security.j2ee.TomcatLoginModule required
    portalContainerName="company"
    realmName="gatein-domain-company";
};
```

For more details, see the [Change the JAAS realm](#) section.

8.7.3. Update APIs

eXo Platform 3.5 has many changes on the data model and APIs. Therefore, if there are any new customized components in your eXo Platform extension that use eXo Platform 3.0 APIs, you need to check if they can work well in eXo Platform 3.5 or not. For more details, see the [eXo Platform 3.5 APIs](#) section.

Finally, you need to update your customized components if needed.