
Kotti Documentation

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Kotti is a light-weight, user-friendly and extensible web content management system. It is licensed under a [BSD-like license](#)

Features

- **User-friendly:** a simple edit interface hides advanced functionality from less experienced users
- **WYSIWYG editor:** includes a rich text editor that lets you edit content like in office applications
- **Security:** advanced user, groups and user roles management; uses [access control lists](#) (ACL) to control access to different parts of the site
- **Templating:** extend Kotti with your own look & feel with very little programming required
- **Customizable:** Many aspects of Kotti are configured through a simple INI file
- **Add-ons:** a plug-in system allows third party software to greatly extend Kotti
- **Pluggable authentication:** allows authentication of users through LDAP or other existing user databases
- **Open:** built on top of well-documented, open source components, such as [Python](#), [Pyramid](#) and [SQLAlchemy](#)
- **Tested:** [continuous testing](#) with a test coverage of 100% guarantees Kotti's stability

1.1 Try it out

You can try out Kotti on [Kotti's demo site](#). The demo files are included in Kotti's source distribution, and the following documentation is available:

1.1.1 Kotti Demo

The source for [Kotti's demo site](#) is included in Kotti's source distribution. This chapter explains how to install and run the demo. You'll need [Python](#) 2.7 or 2.6 installed, along with [virtualenv](#), [Git](#), and [SQLite](#).

Written using Python 2.7.2, Ubuntu 8.04 (yes it's old), Kotti 1.4-dev (rev. 8c5f84902d80d517245c4ace679cac57b89e510d, 2011-11-08), Pyramid 1.3-dev (rev. 2da8c01bb965188f497c9f3a5dde1287b8c7056b, 2011-11-07).

Installation

1. Create a virtualenv. We'll call it "venv".

```
..code-block:: bash
```

```
virtualenv --no-site-packages venv
```

The “--no-site-packages” flag prevents globally-installed Python packages from being visible in the virtualenv. This may avoid version conflicts between Kotti’s dependencies and other packages installed on the system. It’s necessary on Ubuntu because ‘zope’ is a namespace package installed by default on Ubuntu systems, and it does not contain certain subpackages used by pyramid. Namespace packages can’t span installation directories.

2. Activate the virtualenv.

```
source venv/bin/activate
```

3. Check out Kotti’s source repository and other repositories.

```
git checkout git://github.com/Pylons/pyramid
git checkout git://github.com/dnouri/Kotti
git checkout git://github.com/dnouri/kotti_calendar
git checkout git://github.com/dnouri/kotti_twitter
```

We’re using the development versions of Pyramid and Kotti because they’re changing rapidly. We’re checking out kotti_calendar and kotti_twitter because they’re not yet available on PyPI. We aren’t yet using kotti_rstdocument so you can skip it for now, but a future version of the demo will probably use it.

4. Install the packages in the same order. (This order avoids forward dependencies on subsequent repositories.)

```
pip install -e pyramid
pip install -e Kotti
pip install -e kotti_calendar
pip install -e kotti_twitter
```

5. Make a local copy of the demo directory and chdir into it.

```
cp -r Kotti/demo demo
cd demo
```

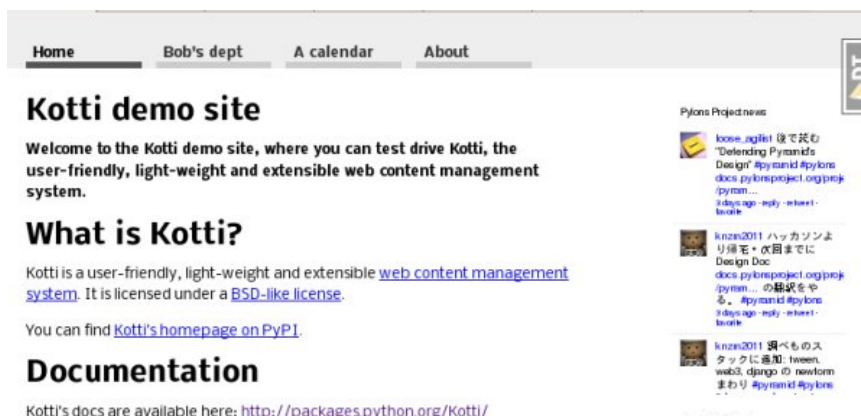
This directory contains the initial demo database (demo.sqlite) and INI file (development.ini). By copying it, you can restore the defaults easily by overwriting the runtime files, without changing the files in the checkout.

6. Run the demo:

```
pserve development.ini
```

(If running on Pyramid 1.2, use the older syntax: “paster serve development.ini”.)

Open your web browser to the URL indicated (<http://127.0.0.1:5000/>). You should see the following screen with “Kotti’s demo site” at the top.



Play around with the site, and when you get bored press ctrl-C to stop the server. The console will log database queries as they are executed.

Troubleshooting:

- If the home page is a blank screen with “My Site” at the top, you’re not using the demo database. Kotti automatically creates a default site if the database file is not found. Make sure the “sqlalchemy.url” setting in the INI file points to the demo database file, and restart the server. The “%(here)s” syntax in the setting’s value means the directory containing the INI file.
- If there’s a black panel on the right side of the screen, that’s Pyramid’s debug toolbar. Click the “Hide” link at the top to shrink it to a small “DT” button.
- If you find the continuously-updating Twitter feed in the right sidebar distracting, you can disable it by putting a “#” at the beginning of the following line in the INI file: “kotti.includes = kotti_twitter.include_search_widget”, and restarting the server.

The top row is the main menu. Four sections are predefined: “Home”, “Bob’s dept”, “Calendar”, and “About”. Click “Bob’s dept”. Open the page editor by appending “edit” to the URL (so that it’s “<http://127.0.0.1:5000/bobs-department/edit>”). You’ll get a login screen. Enter username “admin”, password “qwerty”. (There are two other users, “owner” and “bob”, all with the same password.) The “View” button at the left allows you to switch between view and edit mode. To log out, change the URL to “<http://localhost:5000/logout>”.

Kotti features shown in the demo

XXX

1.2 Under the hood

Kotti is written in [Python](#) and builds upon on the two excellent libraries [Pyramid](#) and [SQLAlchemy](#). Kotti tries to leverage these libraries as much as possible, thus:

- minimizing the amount of code and extra concepts, and
- allowing users familiar with Pyramid and SQLAlchemy to feel right at home since Kotti’s API is mostly that of Pyramid and SQLAlchemy.

Installation

2.1 Requirements

- Runs on Python versions 2.5, 2.6 and 2.7.
- Support for [many SQL databases](#), including SQLite, MySQL and PostgreSQL
- Support for WSGI and a [variety of web servers](#), including Apache

2.2 Installation using `virtualenv`

It's recommended to install Kotti inside a `virtualenv`:

```
virtualenv mysite --no-site-packages
cd mysite
bin/pip install Kotti
```

Kotti uses [Paste Deploy](#) for configuration and deployment. An example configuration file is included with Kotti's source distribution:

```
wget https://github.com/dnouri/Kotti/raw/master/development.ini
```

Finally, to run the application:

```
bin/paster serve development.ini
```

An [example configuration file](#) for [Buildout](#) also exists.

Configuration and customization

3.1 INI File

Kotti is configured using an INI configuration file. The [installation](#) section explains how to get hold of a sample configuration file. The `[app:main]` section in it might look like this:

```
[app:main]
use = egg:Kotti
pyramid.reload_templates = true
pyramid.debug_authorization = false
pyramid.debug_notfound = false
pyramid.debug_routematch = false
pyramid.debug_templates = true
pyramid.default_locale_name = en
pyramid.includes = pyramid_debugtoolbar
                  pyramid_tm
mail.default_sender = yourname@yourhost
sqlalchemy.url = sqlite:///%(here)s/Kotti.db
kotti.site_title = Kotti
kotti.secret = changethis1
```

Various aspects of your site can be changed right here.

3.2 Overview of settings

This table provides an overview of available settings. All these settings must go into the `[app:main]` section of your Paste Deploy configuration file.

Setting	Description
kotti.site_title	The title of your site
kotti.secret	Secret token used as initial admin password
kotti.secret2	Secret token used for email password reset token
sqlalchemy.url	SQLAlchemy database URL
mail.default_sender	Sender address for outgoing email
mail.host	Email host to send from
kotti.includes	List of Python configuration hooks
kotti.available_types	List of active content types
kotti.base_includes	List of base Python configuration hooks
kotti.configurators	List of advanced functions for config
kotti.populators	List of functions to fill initial database
kotti.templates.master_view	Master template used for public views
kotti.templates.master_edit	Master template used for edit screens
kotti.templates.snippets	Override <head> and other common elements
kotti.templates.view_css	CSS file used for public views
kotti.templates.edit_css	CSS file used for edit screens
kotti.templates.base_css	Base CSS file; used for both
kotti.templates.api	Override <code>api</code> used by all templates
kotti.authn_policy_factory	Component used for authentication
kotti.authz_policy_factory	Component used for authorization
kotti.session_factory	Component used for sessions
kotti.date_format	Date format to use, default: <code>medium</code>
kotti.datetime_format	Datetime format to use, default: <code>medium</code>
kotti.time_format	Time format to use, default: <code>medium</code>

Only the settings in bold letters required. The rest has defaults.

3.3 kotti.secret and kotti.secret2

The value of `kotti.secret` will define the initial password of the `admin` user. This is the initial user that Kotti creates in the user database. So if you put *mysecret* here, use *mysecret* as the password when you log in as `admin`. You may then change the `admin` user's password through the web interface.

The `kotti.secret` token is also used for signing browser session cookies.

The `kotti.secret2` token is used for signing the password reset token.

Here's an example. Make sure you use different values though!

```
kotti.secret = myadminspassword
kotti.secret2 = $2a$12$VVpW/i1MA2wUUIUHwY6v8O
```

3.4 Adjusting the look & feel

The `kotti.templates.*` configuration settings allow you to define alternative template and CSS files to be used. An example that overrides both the master template for all public views and configures an alternative CSS file for the edit interface:

```
kotti.templates.master_view = mypackage:templates/master.pt
kotti.templates.edit_css = mypackage:static/edit.css
```

3.5 Using add-ons

Add-ons will usually include in their installation instructions which settings one should modify to activate them. Configuration settings that are used to activate add-ons are:

- `kotti.includes`
- `kotti.available_types`
- `kotti.base_includes`
- `kotti.configurators`

3.5.1 `kotti.includes`

`kotti.includes` defines a list of hooks that will be called by Kotti when it starts up. This gives the opportunity to third party packages to add registrations to the [Pyramid Configurator API](#) in order to configure views and more.

As an example, we'll add the `kotti_twitter` extension to add a Twitter profile widget to the right column of all pages. First we install the package from PyPI:

```
bin/pip install kotti_twitter
```

Then we activate the add-on in our site by editing the `kotti.includes` setting in the `[app:Kotti]` section of our INI file. (If a line with `kotti.includes` does not exist, add it.)

```
kotti.includes = kotti_twitter.include_profile_widget
```

`kotti_twitter` also asks us to configure the Twitter widget itself, so we add some more lines right where we were:

```
kotti_twitter.profile_widget.user = dnouri
kotti_twitter.profile_widget.loop = true
```

The order in which the includes are listed matters. When you add two slots on the right hand side, the order in which you list them here will control the order in which they will appear.

With this configuration, the search widget is displayed on top of the profile widget:

```
kotti.includes =
    kotti_twitter.include_search_widget
    kotti_twitter.include_profile_widget
```

3.5.2 `kotti.available_types`

The `kotti.available_types` setting defines the list of content types available. The default configuration here is:

```
kotti.available_types = kotti.resources.Document
```

An example that adds two content types:

```
kotti.available_types =
    kotti.resources.Document
    mypackage.resources.Calendar
    mypackage.resources.Event
```

3.6 Configuring authentication and authorization

You can override the authentication and authorization policy that Kotti uses. By default, Kotti uses these factories:

```
kotti.authn_policy_factory = kotti.authkt_factory
kotti.authz_policy_factory = kotti.acl_factory
```

These settings correspond to `pyramid.authentication.AuthTktAuthenticationPolicy` and `pyramid.authorization.ACLAuthorizationPolicy` being used.

3.7 Sessions

The `kotti.session_factory` configuration variable allows the overriding of the default session factory, which is `pyramid.session.UnencryptedCookieSessionFactoryConfig`.

Writing add-ons

4.1 Content types

Defining your own content types is easy. The implementation of the Document content type serves as an example here:

```
class Document(Content):
    type_info = Content.type_info.copy(
        name=u'Document',
        add_view=u'add_document',
        addable_to=[u'Document'],
    )

    def __init__(self, body=u"", mime_type='text/html', **kwargs):
        super(Document, self).__init__(**kwargs)
        self.body = body
        self.mime_type = mime_type

documents = Table('documents', metadata,
    Column('id', Integer, ForeignKey('contents.id'), primary_key=True),
    Column('body', UnicodeText()),
    Column('mime_type', String(30)),
)

mapper(Document, documents, inherits=Content, polymorphic_identity='document')
```

You can configure the list of active content types in Kotti by modifying the `kotti.available_types` setting.

If you were to totally customize Kotti, and not even include the stock Document type, you would need to follow the template provided by Document, with some attention to detail for configuration and for instantiating a resource hierarchy, especially the root object. For example, let's say that you replace Document with a custom type called Project (updating available types configuration as needed). In your design, under the Project custom type, you might have a hierarchy of other types, the relationships determined by how the `type_info.addable_to` setup is done, and how the parent property is set for each record on instantiation. When you instantiate the root Project object, the code in the `populate()` method of `resources.py` would be something like:

```
root = Project(name="", title="Mother Project", propertyOne="Something", parent=None)
```

NOTE: So, the details are that the root object must have an empty name (`name=""`) and the parent is None.

4.2 Configuring custom views, subscribers and more

`kotti.includes` allows you to hook `includeme` functions that configure your custom views, subscribers and more. An `includeme` function takes the [Pyramid Configurator API](#) object as its sole argument. An example:

```
def my_view(request):
    from pyramid.response import Response
    return Response('OK')

def includeme(config):
    config.add_view(my_view)
```

By adding the *dotted name string* of your `includeme` function to the `kotti.includes` setting, you ask Kotti to call it on application start-up. An example:

```
kotti.includes = mypackage.views.includeme
```

4.3 `kotti.views.slots`

This module allows add-ons to register renderers that add pieces of HTML to the overall page. In other systems, these are called portlets or viewlets.

A simple example that'll render *Hello, World!* in in the left column of every page:

```
def render_hello(context, request):
    return u'Hello, World!'

from kotti.views.slots import register
from kotti.views.slots import RenderLeftSlot
register(RenderLeftSlot, None, render_hello)
```

Slot renderers may also return `None` to indicate that they don't want to include anything. We can change our `render_hello` function to include a message only when the context is the root object:

```
from kotti.resources import get_root
def render_hello(context, request):
    if context == get_root():
        return u'Hello, World!'
```

The second argument to `kotti.views.slots.register()` allows you to filter on context. These two are equivalent:

```
from kotti.views.slots import RenderRightSlot
from mypackage.resources import Calendar

def render_agenda1(context, request):
    if isinstance(context, Calendar):
        return '<div>...</div>'
register(RenderRightSlot, None, render_agenda1)

def render_agenda2(context, request):
    return '<div>...</div>'
register(RenderRightSlot, Calendar, render_agenda2)
```

Usually you'll want to call `kotti.views.slots.register()` inside an `includeme` function and not on a module level, to allow users of your package to include your slot renderers through the `kotti.includes` configuration setting.

4.4 kotti.events

This module includes a simple events system that allows users to subscribe to specific events, and more particularly to *object events* of specific object types.

To subscribe to any event, write:

```
def all_events_handler(event):
    print event
kotti.events.listeners[object].append(all_events_handler)
```

To subscribe only to *ObjectInsert* events of *Document* types, write:

```
def document_insert_handler(event):
    print event.object, event.request
kotti.events.objectevent_listeners[(ObjectInsert, Document)].append(
    document_insert_handler)
```

Events of type `ObjectEvent` have `object` and `request` attributes. `event.request` may be `None` when no request is available.

Notifying listeners of an event is as simple as calling the `listeners_notify` function:

```
from kotti.events import listeners
listeners.notify(MyFunnyEvent())
```

Listeners are generally called in the order in which they are registered.

4.5 kotti.configurators

Requiring users of your package to set all the configuration settings by hand in the Paste Deploy INI file is not ideal. That's why Kotti includes a configuration variable through which extending packages can set all other INI settings through Python. Here's an example of a function that programmatically modified `kotti.base_includes` and `kotti.principals` which would otherwise be configured by hand in the INI file:

```
# in mypackage/__init__.py
def kotti_configure(config):
    config['kotti.base_includes'] += ' mypackage.views'
    config['kotti.principals'] = 'mypackage.security.principals'
```

And this is how your users would hook it up in their INI file:

```
kotti.configurators = mypackage.kotti_configure
```

4.6 Security

Kotti builds mostly on Pyramid's security API and uses its `inherited access control lists` support. On top of that, Kotti defines *roles* and *groups* support: Users may be collected in groups, and groups may be given roles that define permissions.

The site root's ACL defines the default mapping of roles to their permissions:

```
root.__acl__ == [
    ['Allow', 'system.Everyone', ['view']],
    ['Allow', 'role:viewer', ['view']],
```

```
['Allow', 'role:editor', ['view', 'add', 'edit']],  
['Allow', 'role:owner', ['view', 'add', 'edit', 'manage']],  
]
```

Every Node object has an `__acl__` attribute, allowing the definition of localized row-level security.

The `kotti.security.set_groups()` function allows assigning roles and groups to users in a given context. `kotti.security.list_groups()` allows one to list the groups of a given user. You may also set the list of groups globally on principal objects, which are of type `kotti.security.Principal`.

Kotti delegates adding, deleting and search of user objects to an interface it calls `kotti.security.AbstractPrincipals`. You can configure Kotti to use a different Principals implementation by pointing the `kotti.principals_factory` configuration setting to a different factory. The default setting here is:

```
kotti.principals_factory = kotti.security.principals_factory
```

Contact us

Kotti itself is [developed on Github](#). The [issue tracker](#) also lives there.

Have a question or a suggestion? Write to [Kotti's mailing list](#) or find us on IRC on [irc.freenode.net](#) in channel `#kotti`.

Tests

To run Kotti's automated test suite, do:

```
bin/py.test
```

Or alternatively:

```
bin/python setup.py test
```

You can also run the tests against a different database using the `KOTTI_TEST_DB_STRING` environment variable. By default, Kotti uses an in-memory SQLite database. An example:

```
KOTTI_TEST_DB_STRING=postgresql://kotti:kotti@localhost:5432/kotti-testing bin/python setup.py test
```

Important: Never use this feature against a production database. It will destroy your data.

7.1 API Documentation

7.1.1 `kotti.security`

`kotti.security.set_groups(name, context, groups_to_set=())`

Set the list of groups for principal with given name and in given context.

`kotti.security.list_groups(name, context=None)`

List groups for principal with a given name.

The optional `context` argument may be passed to check the list of groups in a given context.

class `kotti.security.AbstractPrincipals`

This class serves as documentation and defines what methods are expected from a Principals database.

Principals mostly provides dict-like access to the principal objects in the database. In addition, there's the 'search' method which allows searching users and groups.

'hash_password' is for initial hashing of a clear text password, while 'validate_password' is used by the login to see if the entered password matches the hashed password that's already in the database.

Use the 'kotti.principals' settings variable to override Kotti's default Principals implementation with your own.

hash_password(password)

Return a hash of the given password.

This is what's stored in the database as 'principal.password'.

keys()

Return a list of principal ids that are in the database.

search(**kwargs)

Return an iterable with principal objects that correspond to the search arguments passed in.

This example would return all principals with the id 'bob':

```
get_principals().search(name=u'bob')
```

Here, we ask for all principals that have 'bob' in either their 'name' or their 'title'. We pass 'bob' instead of 'bob' to indicate that we want case-insensitive substring matching:

```
get_principals().search(name=u'bob', title=u'bob')
```

This call should fail with `AttributeError` unless there's a 'foo' attribute on principal objects that supports search:

```
get_principals().search(name=u'bob', foo=u'bar')
```

```
validate_password(clear, hashed)
```

Returns True if the clear text password matches the hash.

```
class kotti.security.Principal(name, password=None, active=True, confirm_token=None, title=u'', email=None, groups=())
```

A minimal 'Principal' implementation.

The attributes on this object correspond to what one ought to implement to get full support by the system. You're free to add additional attributes.

- As convenience, when passing 'password' in the initializer, it is hashed using 'get_principals().hash_password'
- The boolean 'active' attribute defines whether a principal may log in. This allows the deactivation of accounts without deleting them.
- The 'confirm_token' attribute is set whenever a user has forgotten their password. This token is used to identify the receiver of the email. This attribute should be set to 'None' once confirmation has succeeded.

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