django-projector Documentation

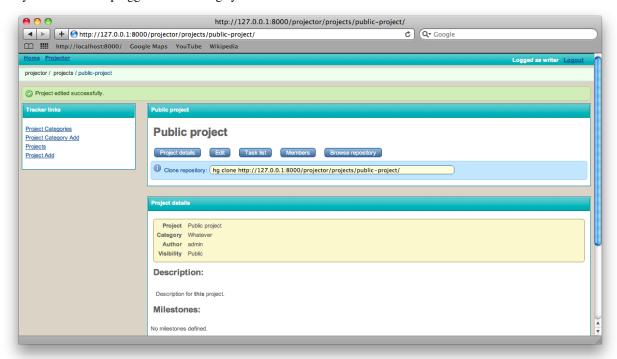
Release 0.1.9

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Contents

Рy	ython Module Index	33
7	Other topics	31
	6.6 Projects documentation 6.7 Testing	
	6.5 Teamwork	19
	6.3 Authorization and permissions	18 19
	6.1 Installation 6.2 Configuration	13 13
6	Documentum	13
5	License	11
4	Demo project	9
3	Source code	7
2	Incoming	5
1	reatures	3

django-projector is a project management application with task tracker and repository backend integration. Aimed to work with Django 1.2 or later. We are sick of Trac ¹ and wanted to create simple application which can be easily customized or plugged into existing systems.



Contents 1

¹ Don't get us wrong, Trac is great tool but we believe that django's pluggable applications are far easier to configure and deploy.

2 Contents

CHAPTER 1

Features

- Mercurial repository integration
- Easy repositories forking
- Granual permissions management (see Authorization and permissions)
- Scalable architecture (AMQP) build on top of excellent celery
- Task tracker with full history of changes
- Repository web browser
- Customizable workflow for each project
- Grouping tasks in milestones
- Roadmap
- Teams support
- Documents based on restructuredText
- Email notification
- Make use of django-richtemplates so templates are ready to use out of the box

4 Chapter 1. Features

Incoming

Here are some additional points which are the target for future release.

- Wiki per project
- Plugin system
- Code review
- Sphinx integration
- Other version control systems in backend (git, subversion...)
- Charts, statistics, graphs, plots, analyzies
- Functional timeline
- django-piston integration for RESTful API

Warning: This application is at early-development stage but we strongly encourage you to give it a try if you are looking for project management toolkit for your Django based project. Still, it probably should **NOT** be used in production as it wasn't fully tested and may contain security issues.

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Source	ce code
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Source code is along with issue tracker is available at http://bitbucket.org/lukaszb/django-projector/.

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Demo	project

Demo project have been deployed at https://forge.django-projector.org. It is still rather experimental.

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License

 $\verb|django-projector| is released under MIT license. You should get a copy of the license with source distribution, at the root location, within LICENSE file.$

12 Chapter 5. License

Documentation

Installation:

6.1 Installation

django-projector is aimed to work with Django 1.2 or later. Moreover, we strongly suggest to use virtualenv and virtualenvwrapper - great tools for creating temporary environment to work on.

6.1.1 Requirements

Requirements should be installed along with projector itself by the setuptools. There is also requirements.txt file at the root of source distribution with all needed packages. To install dependencies one should run pip ¹ command:

pip install -r requirements.txt

6.1.2 Trying it out

django-projector comes with boundled example project. It can be easily used - refer to this document for more details.

6.2 Configuration

After you hook django-projector into your project (see *Installation*) you should probably change some of configuration variables.

6.2.1 Available settings

Those configurable variables should be defined at the project's settings module, just like standard Django's variables.

¹ pip is tool similar to easy_install with some more power (like smooth integration with virtualenv, freeze command, package uninstallation, search and others.

PROJECTOR_ALWAYS_SEND_MAILS_TO_MEMBERS

Default: False

If set to True, any change to project would send an email to each projects' members regardless of their individual preferences.

PROJECTOR_BANNED_PROJECT_NAMES

Default:

```
'account', 'accounts',
'add',
'admin', 'admins',
'api',
'author', 'authors',
'ban',
'category', 'categories',
'change',
'create',
'default',
'delete',
'edit', 'edits',
'etc',
'issue', 'issues',
'mail', 'mails',
'message', 'messages',
'manager', 'managers',
'private',
'profile', 'profiles',
'projects',
'register', 'registration',
'remove',
'task', 'tasks',
'update',
'user', 'users',
'view',
```

List of names which are restricted during project creation.

Note: By specifying own list, we in fact extend default list. We mention this as most of the settings are overridable - this one is not.

PROJECTOR BASIC AUTH REALM

Default: 'Projector Basic Auth'

Text which would appear during basic authorization process within projector's context. Projects' owners can override this *per project*.

PROJECTOR_CHANGESETS_PAGINATE_BY

Default: 10

Number of changesets listed at one page.

PROJECTOR_CREATE_PROJECT_ASYNCHRONOUSLY

Default: True

When new project is created some actions are made using Djangos' signals. By default those actions are made asynchronousely by new thread in order not to block client.

PROJECTOR_DEFAULT_PROJECT_WORKFLOW

Default: projector.conf.default_workflow

Path to object defining default workflow for new projects.

Object must define following iterables: *components*, *task_types*, *priorities* and *statuses*. Each one should contain dictionaries with following key/value pairs:

• components: name

• task_types: name, order

• priorities: name, order

• statuses: name, oder, is_resolved, is_initial

See source code pointed by default value for more detail.

PROJECTOR_DEFAULT_VCS_BACKEND

Default: 'hg'

One of *aliases* specified at *PROJECTOR_ENABLED_VCS_BACKENDS*. See vcs's documentation for available aliases.

PROJECTOR_EDITABLE_PERMISSIONS

Default:

```
'change_project',
'change_config_project',
'view_project',
'can_read_repository',
'can_write_to_repository',
'can_change_description',
'can_change_category',
'can_add_task',
'can_change_task',
'can_delete_task',
'can_view_tasks',
'can_add_member',
'can_change_member',
'can_delete_member',
'can_add_team',
'can_change_team',
'can_delete_team',
```

6.2. Configuration 15

List of permission codenames allowed to be edited by projects' owners.

Note: Removing variables from this tuple (by setting own with subset of available permissions) would not affect permissions - it only tells projector to show forms for permission editing with specified codenames.

PROJECTOR_ENABLED_VCS_BACKENDS

```
Default: ['hg', 'git']
```

Iterable of vcs aliases. To check what backends are available run:

```
>>> import vcs
>>> vcs.backends.BACKENDS.keys()
['hg', 'git']
```

See more at vcs's documentation.

PROJECTOR_FORK_EXTERNAL_ENABLED

Default: False

If set to True users would be allowed to fork projects from external locations (read more at External fork).

Warning: We **DO NOT** take any responsibility caused by using external forking. Reason is simple - some users could use this functionality to attack external hosts by sending crafted values to the fork form. This should be validated by the form first, though.

PROJECTOR FORK EXTERNAL MAP

Default:

```
{
    'bitbucket.org': 'projector.forks.bitbucket.BitbucketForkForm',
    'github.com': 'projector.forks.github.GithubForkForm',
}
```

Dictionary of forms to be used for external forking. Keys would be used as choices at the first step of external forking process. Values should be paths to the fork form. Read more at *External fork*.

PROJECTOR FROM EMAIL ADDRESS

Default: would try to get value from settings.DEFAULT_FROM_EMAIL.

Email address used as sender for all mails send by projector.

PROJECTOR_HG_PUSH_SSL

Default: False.

If set to True, underlying mercurial engine would transmit data using encryption. This setting has precedence over vcs specific configuration.

PROJECTOR_HIDDEN_EMAIL_SUBSTITUTION

Default: 'HIDDEN EMAIL'.

Used as default substitution for hidden emails while using projector.templatetags.hide_email() filter (if no parameter is specified).

PROJECTOR_MAX_PROJECTS_PER_USER

Default: 50

Specifies maximum number of projects one user may create.

PROJECTOR MILESTONE DEADLINE DELTA

Default: 60 (60 days)

This is default value of time delta (in days) added to current date during milestone creation.

PROJECTOR_MILIS_BETWEEN_PROJECT_CREATION

Default: 15000 (15 seconds)

After user created a project, he/she need to wait for time specified with this setting until another project may be created by him/her.

PROJECTOR PRIVATE ONLY

Default: False

If True then only *private* projects may be created. Does *not* affect existing projects.

PROJECTOR_PROJECTS_ROOT_DIR

Default: None

If not specified, no repositories would be created. Must be valid directory path.

PROJECTOR PROJECTS HOMEDIR GETTER

Default: projector.utils.helpers.get_homedir

Location of the function which should return relative project path. In order to calculate full path of homedir, projector.models.Project calls pointed function and appends result to the PROJECTOR_PROJECTS_ROOT_DIR value.

It is possible to change this location and override function. It takes one required project parameter - instance of projector.models.Project. Default implementation returns simply stringified primary key of the given project.

6.2. Configuration 17

PROJECTOR TASK EMAIL SUBJECT SUMMARY FORMAT

Default:

```
"[$project] #$id: $summary"
```

This is default subject format for messages related with tasks. Allows to move name placeholders (\$project, \$id, \$summary). All placeholders are optional - but adviced, obviousely.

6.2.2 get_config_value(key)

6.3 Authorization and permissions

This project management system aims to be used by small to middle companies.

6.3.1 Object-level permissions

django-projector make use of django-guardian to handle object-level permissions. Check out it's documentation to see detailed information on the topic.

6.3.2 Project permissions

Following permissions are defined for each project:

- change_project
- view_project
- can_read_repository
- can_write_to_repository
- can_change_description
- can_change_category
- can_add_task
- can_change_task
- can_delete_task
- can view tasks
- can_add_member
- can_change_member
- can_delete_member
- can_add_team
- can_change_team
- can_delete_team

Usage:

6.4 Example projector-based project

New in version 0.1.7.

We have included example project for django-projector and it can be found at (surprise!) example_project directory within both repository and source release. As django-projector has many dependancies (see *Installation*) it may be hard to start at the first glance but this sample project can be used as entry point.

Note: We use example project to run *tests*.

In order to run example project we need to make some preparation first.

6.4.1 Prepare

Step 1 - media files

When specifing commands we assume we are at example_project directory. Before we can run example project we need to include media files. Thanks to django-richtemplates this is as easy as running one management command:

python manage.py import_media richtemplates projector

This would fetch all necessary media files and put them into MEDIA_ROOT defined at settings module.

Step 2 - database

Now we need to create database (we use sqlite3 backend for sample project). Type following command:

python manage.py syncdb

Step 3 - fire up a worker

We need to run a celery worker for some heavy jobs to be done asynchronously. As we use celery we need to start it at one terminal:

python manage.py celeryd -1 DEBUG

Step 4 - finalize

In fact there is no step 4 - simply run development server:

python manage.py runserver

... and open http://localhost:8000 location in a browser.

6.5 Teamwork

django-projector is all about making life easier for project's members. Thus, we try to implement the best practices in this area, and new proposals are always welcome!

6.5.1 Mappings

Most of the times within Django project we use django.contrib.auth application to store and manage users (auth.User) and groups (auth.Group).

Note: Note that we refer to model using standard notation applabel. ModelName which is used around django community. We prefer that over typing full python path to the specific class.

Those are very simply models and give developers ability to wrap them around they own classes. We use them too and this section describes how we do it at django-projector.

Most important model within application is *Project*. We connect it with users by *Membership* model. Moreover, we also use *Team* - it provides connection between *Project*, auth. User and auth. Group models.

6.5.2 Membership

Each user is related with project by Membership instance.

Administration

Membership for the author of the project is created automatically, and is given all available permissions and thus it's member is referenced as project's administrator.

Project's adminstrator can add new member, change permissions of existing ones or remove members if necessary. Project owner's permissions cannot be changed.

Admin can also manage *teams*.

Other members

User may be project's *member* without associated *Membership* instance if he or she is member of a auth. Group (by the instance of *Team* - see *below* for more detail).

AnonymousUser member

Since Django 1.2 authentication backends may support anonymous user and django-guardian implements this functionality (see more at it's documentation). As so, it is possible to add auth. AnonymousUser as a project's member and manage it's permissions as with any other user.

Warning: It is possible to give out administration privileges to anonymous user this way. Some views (like task creation or project edition) requires user to be logged in but project's owner should be careful about anonymous user's permission management.

Convert to Team

Any user may be converted into *Team* instance. Well, this is not totally true - in fact, by conversion to *Team* we mean *set a team flag* on the user's profile. Conversion is available if user profile's is_team attribute is False and there is no auth. Group instance named same as the user.

Conversion is done within user's dashboard and each step of conversion is described below:

1. User clicks on Convert to Team button at his or her dashboard.

- 2. If there is auth. Group named as the user, ValidationError is raised.
- 3. User confirms conversion.
- 4. auth.Group instance named same as the user is created. This group is automatically added to User.groups.
- 5. UserProfile.is_team attribute is set to True. From now on, accessing UserProfile.group would return auth.Group instance created in previous step.

Conversion's api is provided by Team manager's method projector.managers.TeamManager.convert_from_user().

6.5.3 Team

Any auth. Group may be used to create *Team* instance which bounds auth. Group and *Project*. Normally, one would create group using *account conversion*.

One user may be member of many teams. Single project may be managed by many users *and* many teams. It may be confusing but it's really simple.

6.6 Projects documentation

6.6.1 The Basics

Return to Projects documentation.

Creating projects

As *Project* is most important (for django-projector) and rather non-trival model we would like to present whole process of creating projects, step by step.

Let's create our first project:

```
>>> from django.contrib.auth.models import User
>>> from projector.models import Project
>>> joe = User.objects.get(username='joe')
>>> project = Project.objects.create(author=joe, name='foobar')
```

Now we need to add *metadata* for created project. This is done in a few steps:

- set_memberships
- set_author_permissions
- create_workflow
- create_config
- create_repository

set_memberships

Now we need to add membership for the author and if he/she is a *team* we would create a *Team* instance binding *Project* and auth. Group. We simply call set_memberships method which would do this for us:

```
>>> project.members.all()
[]
>>> project.set_memberships()
>>> project.members.all()
[<User: joe>]
```

set_author_permissions

After author become first member of the project he/she still cannot, i.e. change the project:

```
>>> joe.has_perm('projector.change_project', project)
>>> False
```

Note: At projector's views if requested user is author of the project, permissions are not checked at all. This is intenional, as less database hits is always better. On the other hand, if i.e. user would give project away to other user, he still should have all permissions - at least until new owner wouldn't took them from original author.

We can now set permissions:

```
>>> project.set_author_permissions()
>>> joe.has_perm('projector.change_project', project)
>>> True
```

create workflow

Workflow is a set of statuses, components etc. for each project. Default set of objects is pointed by *PROJECTOR_DEFAULT_PROJECT_WORKFLOW*. Workflow itself may be modified for each project. We may pass a string pointing to the python object or an object itself. Again, simply fire up the method:

```
>>> project.create_workflow()
```

create_config

Per project configuration is available at Config. This model defines all changable settings for each project all projects need one:

```
>>> project.create_config()
```

create_repository

If PROJECTOR_CREATE_REPOSITORIES is set to True then we should create repository for the project:

setup

Project comes with setup method which would call all preparation methods at given instance. Is is possible to pass vcs_alias and workflow parameters but they are not required. So all of the above code may be called with little less effort:

```
>>> from django.contrib.auth.models import User
>>> from projector.models import Project
>>> joe = User.objects.get(username='joe')
>>> project = Project.objects.create(author=joe, name='foobar')
>>> project.setup()
```

Using manager

At previous section, *Creating projects*, we have seen that there are some methods which should be called every time new *Project* is created. We can call *setup* method to make the process less tedious. On the other hand it may be even better if we can simply save *Project* instance into database and call <code>setup</code> method asyncronously (if <code>CREATE_PROJECT_ASYNCHRONOUSLY</code> is set to <code>True</code>).

Project.objects.create_project

There is a special signal setup_project which is called by the ProjectManager's create_project method. It is preferred way to create new Project:

```
>>> from django.contrib.auth.models import User
>>> from projector.models import Project
>>> joe = User.objects.get(username='joe')
>>> project = Project.objects.create_project(author=joe, name='foobar')
```

We can also specify vcs_alias or workflow parameters directly:

```
>>> project = Project.objects.create_project(author=joe, name='foobar', vcs_alias='hg', workflow=None
```

6.6.2 Forking

Return to *Projects documentation*.

New in version 0.1.8.

In many situations we need to *clone* one project, make some changes (*progress*), review them and eventually merge them into upstream. Or we know that our changes won't be accepted (or shouldn't be) but we still need to make them for our own reasons. When we talk about software repository we would call that clone a *branch*. But if we refer to project as a whole, we often call this projects' copies *forks*.

django-projector allows user to fork another project not only within it's own context. It is also possible to fork a project from external location, i.e. from Bitbucket.

Internal fork

This is standard fork functionality which may be found at other forges. Procedure is simple:

- 1. Jack decides to fork project named joe's project
- 2. At the joe's project main page Jack clicks on Fork button
- 3. Jack is redirected to his new forked project named as original one

External fork

At his or her dasboard, user can find a *Fork project* button. This does **not** refer to *internal fork*. External forking only allows to fork from external location.

To enable this functionality, it's necessary to set PROJECTOR_FORK_EXTERNAL_ENABLED = True at settings file. Moreover, PROJECTOR_FORK_EXTERNAL_MAP dict setting should be set properly (see *Configuration*).

Warning: We **DO NOT** take any responsibility caused by using external forking. Reason is simple - some users could use this functionality to attack external hosts by sending crafted values to the fork form. Values should be validated by the form first, though.

How to write external fork form

External fork form should subclass projector.forks.base.BaseExternalForkForm and implement fork method:

• fork (): this method should implement action required to create projector.models.Project instance. Note that real fork procedure is fired by project creation handler. We may create a project in whatever way we want here but most basic scenario is to pass author, name and public attributes to the constructor of projector.models.Project class.

Note: All exceptions at fork method should be caught and eventually propagated but with type <code>ProjectorError</code> (or a subclass of it). It is necessary for <code>projector.forms.ExternalForkWizard</code> to properly notify user if any error has occured during forking process. Those are not validation errors as <code>fork</code> method should be called only after form is cleaned.

Moreover, projector.forks.base.BaseExternalForkForm subclasses need to be initialized with django.http.HttpRequest as first positional argument (this is required for further form's validation).

Base fork form class comes with one field as_private. After form validation it is possible to check if project should be forked as *public* or *private* by calling is_public form's method. This method would return True or False.

After form is implemented we can hook it at the PROJECTOR FORK EXTERNAL MAP.

We advice to review code of projector.forks.bitbucket module to see full example.

Development

6.7 Testing

We decided that best way to test django-projector would be to use not complicated, boundled *example project*. It means less maintainance as tests have to be make within django context anyway. On the other hand, this also implies that tests are run in specifically defined environment (django settings module) so it may not always fit into real project. This is still little disadvantage and less maintainance means less work before release.

6.7.1 How to test

In order to run test suite we simply run:

python setup.py test

This should invoke preparation process and fire up Django test runner.

Note: It is also possible to run test suite using management command but please remember that we have to use some custom settings and therefor it is **required** to use <code>example_project/settings_test.py</code>. Simply run following command within example project:

\$ python manage.py test projector --settings=settings_test

API

6.8 API Reference

6.8.1 Core

Return to API Reference.

Controllers

Return to Core.

View

Exceptions

Exceptions raised by django-projector.

All internal error classes should extend from one of those exceptions.

ProjectorError should always be top-level exception class.

Return to Core.

ProjectorError

```
class projector.core.exceptions.ProjectorError
    Main django-projector exception.
```

ConfigAlreadyExist

```
class projector.core.exceptions.ConfigAlreadyExist
```

ForkError

class projector.core.exceptions.ForkError

6.8.2 Forms

Return to API Reference.

6.8. API Reference 25

ProjectCreateForm

ProjectEditForm
ProjectForkForm
ConfigForm
UserProfileForm
ExternalForkWizard
UserConvertToTeamForm
DashboardAddMemberForm
6.8.3 Managers
Return to API Reference.
ProjectManager
6.8.4 Models
Return to API Reference.
Project
See also ProjectManager.

Config Milestone Component **Priority Status Transition TaskType** AbstractTask **TaskRevision** Task Membership **Team UserProfile** 6.8.5 Utils Return to API Reference. **Basic** projector.utils.abspath Returns absolute path for given *paths. projector.utils.str2obj projector.utils.using_projector_profile

Email

Helpers

 ${\tt projector.utils.helpers.get_homedir}$

6.8.6 Signals

Return to API Reference.

6.8. API Reference 27

Provided signals

django-projector provides following signals:

post_fork

After fork is done post_fork signal should be send.

providing_args:

Name	Description
fork	Should be a Project instance forked from another project

setup_project

Should be send by *Project* instance.

Name	Description
instance	Project instance which should be setup
vcs_alias	If given, would be used as backend for new repository
workflow	If given, would override default workflow

6.8.7 Views

Return to API Reference.

Project views

Return to Views.

ProjectView

ProjectDetailView

ProjectListView

ProjectCreateView

ProjectForkView

Project repository views

Return to Views.

RepositoryView RepositoryBrowse RepositoryFileDiff RepositoryFileRaw RepositoryFileAnnotate RepositoryChangesetList RepositoryChangesetDetail **Users views** Return to Views. **UserListView** UserHomepageView UserProfileDetailView UserDashboardView UserDashboardForkView UserDashboardConvert2TeamView **UserDashboardAddMember**

6.8. API Reference 29

CHAPTER 7

Other topics

- genindex
- search

p

projector.core.exceptions,25

34 Python Module Index

A	ProjectForkForm, 26
AbstractTask model, 27	UserConvertToTeamForm, 26 UserProfileForm, 26
ALL	
setting, 13	G
С	get_config_value setting, 18
Component model, 27	M
Config	manager
model, 26	ProjectManager, 26
ConfigAlreadyExist	Membership
error, 25	model, 27 Milestone
ConfigAlreadyExist (class in projector.core.exceptions),	model, 27
25 ConfigEorm	model, 27
ConfigForm form, 26	AbstractTask, 27
101111, 20	Component, 27
D	Config, 26
DashboardAddMemberForm	Membership, 27
form, 26	Milestone, 27
	Priority, 27
E	Project, 26
error	Status, 27
ConfigAlreadyExist, 25	Task, 27
ForkError, 25	TaskRevision, 27
ProjectorError, 25	TaskType, 27
ExternalForkWizard	Team, 27
form, 26	Transition, 27 UserProfile, 27
F	Oseir ioille, 27
•	P
ForkError	post_fork
error, 25 Fowle Error (class in projector core exceptions) 25	signal, 28
ForkError (class in projector.core.exceptions), 25 form	Priority
ConfigForm, 26	model, 27
DashboardAddMemberForm, 26	Project
ExternalForkWizard, 26	model, 26
ProjectCreateForm, 25	ProjectCreateForm
ProjectEditForm, 26	form, 25

ProjectCreateView	setting, 17	
view, 28	PROJECTOR_TASK_EMAIL_SUBJECT_SUMMARY_FORMAT	
ProjectDetailView	setting, 17	
view, 28	ProjectorError	
ProjectEditForm	error, 25	
form, 26	ProjectorError (class in projector.core.exceptions), 25	
ProjectForkForm	ProjectView	
form, 26	view, 28	
ProjectForkView	П	
view, 28	R	
ProjectListView	RepositoryBrowse	
view, 28	view, 29	
ProjectManager	RepositoryChangesetDetail	
manager, 26	view, 29	
projector.core.exceptions (module), 25	RepositoryChangesetList	
PROJECTOR_ALWAYS_SEND_MAILS_TO_MEMBERS	S view, 29	
setting, 13	RepositoryFileAnnotate	
PROJECTOR_BANNED_PROJECT_NAMES	view, 29	
setting, 14	RepositoryFileDiff	
PROJECTOR_BASIC_AUTH_REALM	view, 29	
setting, 14	RepositoryFileRaw	
PROJECTOR_CHANGESETS_PAGINATE_BY	view, 29	
setting, 14	RepositoryView	
PROJECTOR_CREATE_PROJECT_ASYNCHRONOUSL		
setting, 15		
PROJECTOR_DEFAULT_PROJECT_WORKFLOW	S	
setting, 15	setting	
PROJECTOR_DEFAULT_VCS_BACKEND	ALL, 13	
setting, 15	get_config_value, 18	
PROJECTOR_EDITABLE_PERMISSIONS	PROJECTOR_ALWAYS_SEND_MAILS_TO_MEMBERS,	
setting, 15	13	
PROJECTOR_ENABLED_VCS_BACKENDS	PROJECTOR_BANNED_PROJECT_NAMES, 14	
setting, 16	PROJECTOR_BASIC_AUTH_REALM, 14	
PROJECTOR_FORK_EXTERNAL_ENABLED	PROJECTOR_CHANGESETS_PAGINATE_BY, 14	
setting, 16	PROJECTOR_CREATE_PROJECT_ASYNCHRONOUSLY,	
PROJECTOR_FORK_EXTERNAL_MAP	15	
setting, 16	PROJECTOR_DEFAULT_PROJECT_WORKFLOW,	
PROJECTOR_FROM_EMAIL_ADDRESS	15	
setting, 16	PROJECTOR_DEFAULT_VCS_BACKEND, 15	
PROJECTOR_HG_PUSH_SSL	PROJECTOR_EDITABLE_PERMISSIONS, 15	
setting, 16	PROJECTOR_ENABLED_VCS_BACKENDS, 16	
PROJECTOR_HIDDEN_EMAIL_SUBSTITUTION	PROJECTOR_FORK_EXTERNAL_ENABLED,	
setting, 16	16	
PROJECTOR_MAX_PROJECTS_PER_USER	PROJECTOR_FORK_EXTERNAL_MAP, 16	
setting, 17	PROJECTOR_FROM_EMAIL_ADDRESS, 16	
PROJECTOR_MILESTONE_DEADLINE_DELTA	PROJECTOR_HG_PUSH_SSL, 16	
setting, 17	PROJECTOR HIDDEN EMAIL SUBSTITUTION,	
PROJECTOR_MILIS_BETWEEN_PROJECT_CREATION	N 16	
setting, 17	PROJECTOR_MAX_PROJECTS_PER_USER, 17	
PROJECTOR_PRIVATE_ONLY	PROJECTOR_MILESTONE_DEADLINE_DELTA,	
setting, 17	17	
PROJECTOR_PROJECTS_HOMEDIR_GETTER	PROJECTOR_MILIS_BETWEEN_PROJECT_CREATION,	
setting, 17	17	
PROJECTOR_PROJECTS_ROOT_DIR	PROJECTOR_PRIVATE_ONLY, 17	

36 Index

PROJECTOR_PROJECTS_HOMEDIR_GETTER,	ProjectListView, 28
17	ProjectView, 28
PROJECTOR_PROJECTS_ROOT_DIR, 17	RepositoryBrowse, 29
PROJECTOR_TASK_EMAIL_SUBJECT_SUMMARY_F	
17	RepositoryChangesetList, 29
setup_project	RepositoryFileAnnotate, 29
signal, 28	RepositoryFileDiff, 29
signal	RepositoryFileRaw, 29
post_fork, 28	RepositoryView, 28
setup_project, 28	UserDashboardAddMember, 29
Status	UserDashboardConvert2TeamView, 29
model, 27	UserDashboardForkView, 29
Т	UserDashboardView, 29
	UserHomepageView, 29
Task	UserListView, 29
model, 27	UserProfileDetailView, 29
TaskRevision	View, 25
model, 27	
TaskType	
model, 27	
Team	
model, 27	
Transition	
model, 27	
U	
UserConvertToTeamForm	
form, 26	
UserDashboardAddMember	
view, 29	
UserDashboardConvert2TeamView	
view, 29	
UserDashboardForkView	
view, 29	
UserDashboardView	
view, 29	
UserHomepageView	
view, 29 UserListView	
view, 29	
UserProfile	
model, 27	
UserProfileDetailView	
view, 29	
UserProfileForm	
form, 26	
V	
View	
view, 25	
view	
ProjectCreateView, 28	
ProjectDetailView, 28	
ProjectForkView, 28	

Index 37