django cms Documentation

Release 4.1.0

django CMS Association and contributors

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CHAPTER

ONE

PHILOSOPHY

The design philosophy of django CMS is to solve something complex with many simple things.

The core of django CMS is designed to be simple and integrate with simple packages to create complex applications. For example, you may add `djangocms-versioning` to manage versions of your content, `djangocms-moderation` to define workflows for how content moves from authoring to being published.

CHAPTER

TWO

OVERVIEW

django CMS is a modern web publishing platform built with Django, the web application framework "for perfectionists with deadlines".

django CMS offers out-of-the-box support for the common features you'd expect from a CMS, but can also be easily customised and extended by developers to create a site that is tailored to their precise needs.

This is the developer documentation. To get an overview on how to use django CMS, see the django CMS User Guide.

2.1 Tutorials

Start here as a new django CMS developer:

- installation
- using additional packages
- creating your own addon applications.

2.2 How-to guides

Practical **step-by-step guides** for the more experienced developer, covering several important topics.

2.3 Explanation

Explanation and analysis of some key concepts in django CMS.

2.4 Reference

Technical reference material, for

- classes,
- methods,
- APIs,
- commands.

CHAPTER

THREE

JOIN US ONLINE

The django CMS Association is a non-profit organisation that exists to support the development of django CMS and its community.

3.1 Slack

Join our friendly Slack group for **support** and to **share ideas** and **discuss technical questions** with other members of the community.

3.2 StackOverflow

StackOverflow is also a good place for questions around django CMS and its plugin ecosystem.

CHAPTER

FOUR

WHY DJANGO CMS?

django CMS is a well-tested CMS platform that powers sites both large and small. Here are a few of the key features:

- robust internationalisation (i18n) support for creating multilingual sites
- front-end editing, providing rapid access to the content management interface
- support for a variety of editors with advanced text editing features.
- a flexible plugin system that lets developers put powerful tools at the fingertips of editors, without overwhelming them with a difficult interface
- …and much more

There are other capable Django-based CMS platforms, but here's why you should consider django CMS:

- thorough documentation
- easy and comprehensive integration into existing projects - django CMS isn't a monolithic application
- a healthy, active and supportive developer community
- a strong culture of good code, including an emphasis on automated testing

CHAPTER

FIVE

SOFTWARE VERSION REQUIREMENTS AND RELEASE NOTES

This document refers to version 4.1.0.

5.1 Long-term support (LTS)

Django has a long-term support (LTS) policy which django CMS adapts.

Designated django CMS versions receive support for use with official Django LTS versions:

5.1.1 Current LTS table

django CMS	Feature freeze	Django	End of long-term support
4.1 x	tbd	4.2	April 2026
		3.2	April 2024
3.11.x	September 2023	4.2	April 2026
		3.2	April 2024

After feature freeze, new features go into the next major version of django CMS.

5.1.2 Unsupported LTS versions

The following LTS versions **do not** receive any support any more:

django CMS	Feature freeze	Django	End of long-term support
3.8 x	June 2020	2.2	April 2022
3.7.x	October 2020	2.2	March 2022
		1.11	March 2020

5.2 Django/Python compatibility table

LTS in the table indicates a combination of Django and django CMS *both* covered by a long-term support policy.

✓ indicates that the version has been tested and works. × indicates that it has not been tested, or is known to be incompatible.

django CMS	Python							Django							
	3.12	3.11	3.10	3.9	3.8	3.7	3.6	5.0	4.2	4.1	4.0	3.2	3.1	3.0	2.2
4.1.x	✓	✓	✓	✓	×	×	×	✓	LTS	✓	✓	LTS	×	×	×
3.11.3+	×	✓	✓	✓	✓	✓	×	×	LTS	✓	✓	LTS	×	×	×
3.11.1	×	✓	✓	✓	✓	✓	×	×	✓	✓	✓	×	×	×	×
3.11.0	×	✓	✓	✓	✓	✓	×	×	×	×	✓	✓	×	×	×
3.10.x	×	×	✓	✓	✓	✓	×	×	×	×	×	✓	✓	✓	✓
3.9.x	×	×	×	✓	✓	✓	✓	×	×	×	×	✓	✓	✓	✓
3.8.x	×	×	×	✓	✓	✓	✓	×	×	×	×	×	✓	✓	LTS
3.7.x	×	×	×	✓	✓	✓	✓	×	×	×	×	×	×	✓	LTS

See the repository's `setup.cfg` for details of dependencies, or the *Release notes & upgrade information* for information about what is required or has changed in particular versions of the CMS.

The *Commonly Used Plugin section* provides an overview of other packages required in a django CMS project.

5.2.1 Tutorials

The pages in this section of the documentation are aimed at the newcomer to django CMS. They're designed to help you get started quickly, and show how easy it is to work with django CMS as a developer who wants to customise it and get it working according to their own requirements.

These tutorials take you step-by-step through some key aspects of this work. They're not intended to explain the *topics in depth*, or provide *reference material*, but they will leave you with a good idea of what is possible to achieve in just a few steps, and how to go about it.

Once you're familiar with the basics presented in these tutorials, you'll find the more in-depth coverage of the same topics in the *How-to* section.

The tutorials follow a logical progression, starting from installation of django CMS and the creation of a brand new project, and build on each other, so it's recommended to work through them in the order presented here.

Installing django CMS

The setup is incredibly simple, and in this django CMS tutorial, we'll take you through the first five steps to help get you started.

What you need to get started

First of all, you don't need to be a senior developer or have prior experience as a developer with Django or Python to create your first django CMS demo website. In fact, one of the added benefits of django CMS is that it offers a powerful yet easy to use interface for most common tasks of setting up a web site. You can focus on any specific needs of your project.

Before we begin the django CMS tutorial, you will need to know that there are several ways to install django CMS for free.

1. You can either set up a project on Divio Cloud, which is fast and useful for people without a technical background and a good starting point to experience the CMS User Interface.
2. As another option, you can set up the project using docker. It is a good way for a developer locally without an external vendor and we use this option in this django CMS demo.
3. The last option is to install is creating a django CMS project manually into a local virtual environment by running the `djangocms` command. This will create a new Django project set up for running django CMS based on a django CMS-specific project template. See *Installing django CMS by hand* for details. This option is a good way for developers that want to install everything by hand to understand better, have full control, or want to add to an existing Django project.

In this tutorial we will cover both options 2 and 3, including the explanation what exactly needs to happen when you add django CMS to a Django project.

Production-ready: django CMS quickstart

The django CMS quickstart project is a template for a Docker-based production-ready setup. Especially if you know your way around Docker, you will be able to quickly set up a project that is ready for deployment.

If you just want to test a project locally without Docker, you can *install django CMS by hand in a few steps*.

Setup Docker (Step 1)

Install docker from here. If you have not used docker in the past, please read this introduction on docker.

Run the demo project in docker (Step 2)

Info: The demo project is a minimal Django project with some additional requirements in the `requirements.txt`.

For more details see its Open the terminal application on your computer and go to a safe folder (i.e. `cd ~/Projects`), then

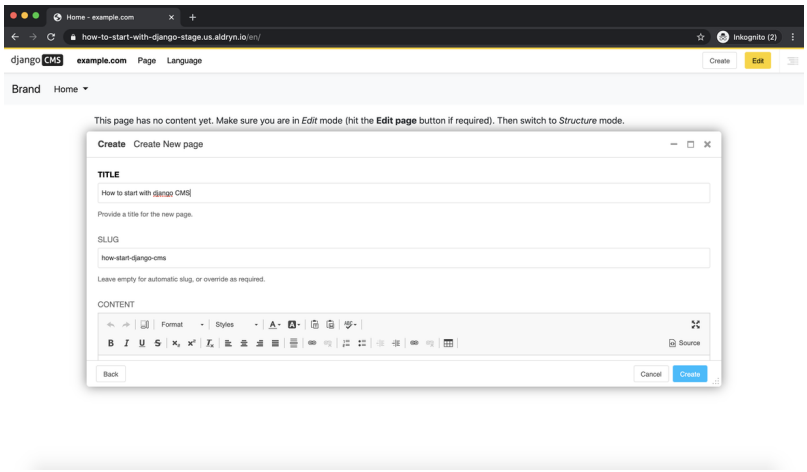
```
git clone git@github.com:django-cms/django-cms-quickstart.git

cd django-cms-quickstart
docker compose build web
docker compose up -d database_default
docker compose run web python manage.py migrate
docker compose run web python manage.py createsuperuser
docker compose up -d
```

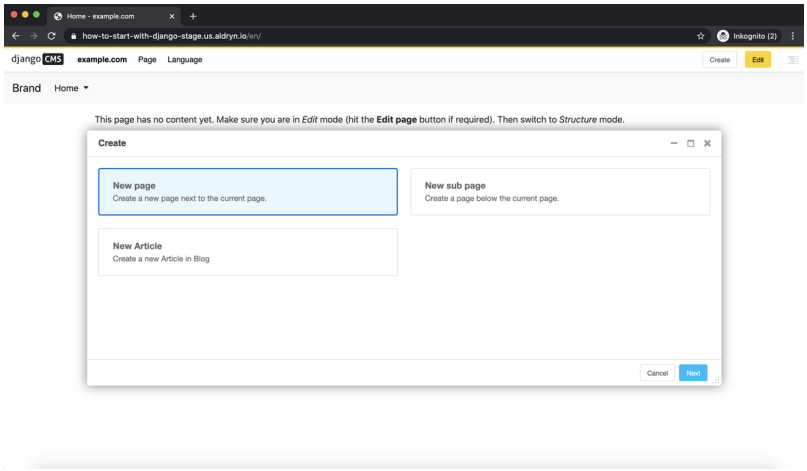
During the installation process, you will be prompted to enter your email address and set a username and password. Open your browser and insert `http://localhost:8000/admin` there you should be invited to login and continue with Step 3: create your first page

Create your first page (Step 3)

- Once you login you can press Create on the top right.
- Then you will see a pop-up window where the "New page" is marked blue.
- Press New Page and select Next.



After selecting Next, you will add in your title and some basic text content for the new page, click Create.

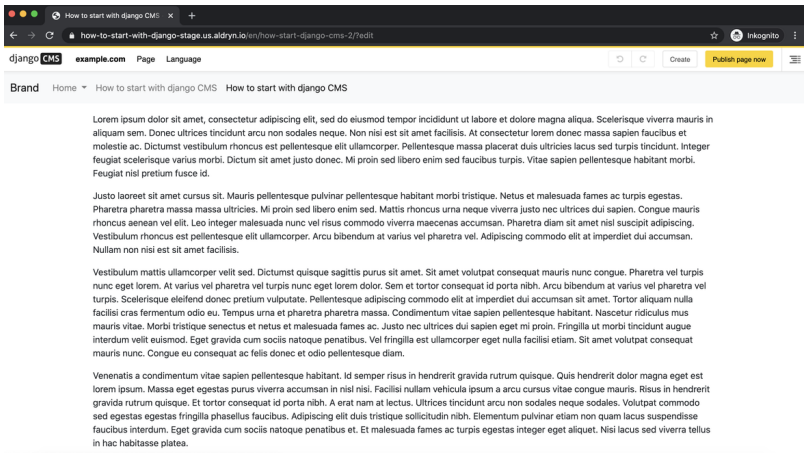


Here is your newly created page.

Publish your first page (Step 4)

The page we just created is just a draft and needs to be published once you finish. As an editor, only you can see and edit your drafts, other visitors to your site will only see your published pages.

Press "Publish"



To edit the page, you can switch back into editing mode using the "Edit" button, and return to the published version of the page using the "view published" button.

In the editing mode, you can double-click on the paragraph of the text to change it, add formatting, and save it again. Any changes that are made after publishing are saved to a draft and will not be visible until you re-publish.

Congratulations, you now have installed django CMS and created your first page.

If you need to log in at any time, append `?toolbar_on` to the URL and hit Return. This will enable the toolbar, from where you can log in and manage your website.

Installing django CMS by hand

If you are looking for a typical installation using Docker look at the *quickstarter section of this documentation*.

If you prefer to do things manually, this how-to guide will take you through the process. It is simple, quick, and transparent. If you know Django, you will recognize how django CMS is set up like a typical Django project.

Note: You can also use this guide to help you install django CMS as part of an existing project. However, the guide assumes that you are starting with a blank project, so you will need to adapt the steps below appropriately as required. You

---

This document assumes you have some basic familiarity with Python and Django. After you've integrated django CMS into your project, you should be able to follow the *Tutorials* for an introduction to developing with django CMS.

Install the django CMS package (Step 1)

Check the *Python/Django requirements* for this version of django CMS.

django CMS also has other requirements, which it lists as dependencies in its `setup.py`.

Important: We strongly recommend doing all of the following steps in a virtual environment. You ought to know how to create, activate and dispose of virtual environments. If you don't, you can use the steps below to get started, but you are advised to take a few minutes to learn the basics of using virtual environments before proceeding further.

```
python3 -m venv .venv  # create a virtualenv
source .venv/bin/activate  # activate it
pip install --upgrade pip  # Upgrade pip
```

Then:

```
pip install django-cms
```

to install the release candidate version of django CMS. It will also install its dependencies including Django.

Create a new django CMS project (Step 2)

Create a new django CMS project:

```
djangocms myproject
```

This is a shortcut command for creating a new Django project with the right project template. It performs the following five steps in one simple go:

1. It creates a new Django project:

   ```
   django-admin startproject myproject --template https://github.com/django-cms/cms-
   ↪template/archive/4.1.tar.gz
   ```

   If `django-admin startproject` is new to you, you ought to read the official Django tutorial, which covers starting a new project.

2. It installs additional optional packages which are used in the template project. Those are

   - djangocms-text-ckeditor for rich text input.
   - djangocms-frontend for Bootstrap5 support.
   - django-filer for managing media files like images.
   - djangocms-versioning for publishing and version management,
   - djangocms-alias for managing common content parts such as footers.
   - djangocms_admin_style for a consistent user experience with django CMS and Django admin.

3. It changes into the project directory and runs the `migrate` command to create the database:

   ```
   python -m manage migrate
   ```

4. It prompts for crating a superuser by invoking:

   ```
   python -m manage createsuperuser
   ```

5. It runs the django CMS check command to verify the installation is consistent:

   ```
   python -m manage cms check
   ```

Your new project will look like this:

```
myproject/
    LICENSE
    README.md
    db.sqlite3
    myproject/
```

(continues on next page)

(continued from previous page)

```
        static/
        templates/
            base.html
        __init__.py
        asgi.py
        settings.py
        urls.py
        wsgi.py
    manage.py
    requirements.in
```

The `LICENSE` and `README.md` files are not needed and can be deleted or replaced by appropriate files for your project.

`requirements.in` contains dependencies for the project. Add your dependencies here. We suggest to use pip-compile to freeze your requirements as, for example, discussed in this blog post.

Spin up your Django development server (Step 3)

Now you are ready to spin up Django's development server by first changing directory into the project folder and then spinning up the development server:

```
cd myproject
python -m manage runserver
```

You can visit your project's web site by pointing your browser to `localhost:8000`.

Use the newly created superuser's credentials to authenticate and create your first page!

Adding django CMS to an existing Django project

django CMS is nothing more than a powerful set of Django apps. Hence you can add django CMS to any Django project. It will require some settings to be modified, however.

Minimally-required applications and settings

To run djanog CMS you will only need to modify the `settings.py` and `urls.py` files.

Open the new project's `settings.py` file in your text editor.

INSTALLED_APPS

You will need to add the following to its list of `INSTALLED_APPS`:

```
"django.contrib.sites",
"cms",
"menus",
"treebeard",
```

- django CMS needs to use Django's `django.contrib.sites` framework. You'll need to set a `SITE_ID` in the settings - `SITE_ID = 1` will suffice.

- `cms` and `menus` are the core django CMS modules.
- django-treebeard is used to manage django CMS's page tree structures.

django CMS also installs django CMS admin style. This provides some styling that helps make django CMS administration components easier to work with. Technically it's an optional component and does not need to be enabled in your project, but it's strongly recommended for a more consistent user experience.

In the `INSTALLED_APPS`, **before** `django.contrib.admin`, add:

```
"djangocms_admin_style",
```

Language settings

django CMS requires you to set the `LANGUAGES` setting. This should list all the languages you want your project to serve, and must include the language in `LANGUAGE_CODE`.

For example:

```
LANGUAGES = [
    ("en", "English"),
    ("de", "German"),
    ("it", "Italian"),
]
LANGUAGE_CODE = "en"
```

(For simplicity's sake, at this stage it is worth changing the default `en-us` in that you'll find in the `LANGUAGE_CODE` setting to `en`.)

Database

django CMS like most Django projects requires a relational database backend. Each django CMS installation should have its own database.

You can use SQLite, which is included in Python and doesn't need to be installed separately or configured further. You are unlikely to be using that for a project in production, but it's ideal for development and exploration, especially as it is configured by default in a new Django project's `DATABASES`.

Note: For deployment, you'll need to use a production-ready database with Django. We recommend using PostgreSQL or MySQL.

Installing and maintaining database systems is far beyond the scope of this documentation, but is very well documented on the systems' respective websites.

Whichever database you use, it will also require the appropriate Python adaptor to be installed:

```
pip install psycopg2     # for Postgres
pip install mysqlclient  # for MySQL
```

Refer to `Django's DATABASES setting documentation` for the appropriate configuration for your chosen database backend.

Confirming that you are not migrating a version 3 project

Add to `settings.py`:

```
CMS_CONFIRM_VERSION4 = True
```

This is to ensure that you do not accidentally run migrations on a django CMS version 3 database. This can lead to corruption since the data structures for the `CMSPlugin` models are different.

> **Warning:** Do not add `CMS_CONFIRM_VERSION4 = True` to your django CMS version 3 project unless you know what you are doing. Just running migrations can lead to data loss.

> **Warning:** To migrate a django CMS version 3 project to version 4 you can have a look at django CMS 4 migration. This is a third party project supposed to assist the migration from v3 to v4. It is not (yet) officially supported.

Database tables

Now run migrations to create database tables for the new applications:

```
python manage.py migrate
```

Sekizai

Django Sekizai is required by the CMS for static files management. You need to have:

```
"sekizai"
```

listed in `INSTALLED_APPS`, and:

```
"sekizai.context_processors.sekizai"
```

in the `TEMPLATES['OPTIONS']['context_processors']`:

```
TEMPLATES = [
    {
        ...
        "OPTIONS": {
            "context_processors": [
                ...
                "django.template.context_processors.i18n",
                "sekizai.context_processors.sekizai",
            ],
        },
    },
]
```

Middleware

in your `MIDDLEWARE` you'll need `django.middleware.locale.LocaleMiddleware` - it's **not** installed in Django projects by default.

Also add:

```
"django:django.middleware.locale.LocaleMiddleware",  # not installed by default

"cms.middleware.user.CurrentUserMiddleware",
"cms.middleware.page.CurrentPageMiddleware",
"cms.middleware.toolbar.ToolbarMiddleware",
"cms.middleware.language.LanguageCookieMiddleware",
```

to the list.

You can also add `'cms.middleware.utils.ApphookReloadMiddleware'`. It's not absolutely necessary, but it's *useful*. If included, should be at the start of the list.

add the following configuration to your `settings.py`:

```
X_FRAME_OPTIONS = "SAMEORIGIN"
```

Context processors

Add `"cms.context_processors.cms_settings"` to `TEMPLATES['OPTIONS']['context_processors']`.

Also add `'django.template.context_processors.i18n'` if it's not already present.

`cms check` should now be unable to identify any further issues with your project. Some additional configuration is required however.

Further required configuration

URLs

In the project's `urls.py`, add `path("", include("cms.urls"))` to the `urlpatterns` list, preferably as `i18patterns`. It should come after other patterns, so that specific URLs for other applications can be detected first.

You'll also need to have an import for `django.urls.include`. For example:

```
from django.conf.urls.i18n import i18n_patterns
from django.urls import include, path

urlpatterns = i18patterns(
    path("admin/", admin.site.urls),
    path("", include("cms.urls")),
)
```

The django CMS project will now run, as you'll see if you launch it with `python manage.py runserver`. You'll be able to reach it at http://localhost:8000/, and the admin at http://localhost:8000/admin/. You won't yet actually be able to do anything very useful with it though.

Versioning and Aliases

Compared to previous versions of django CMS, the core django CMS since version 4 has been stripped of some functionality to allow for better implementations. The two most important examples are the now separate apps django CMS versioning and django CMS alias. We highly recommend installing them both:

```
pip install djangocms-versioning
pip install djangocms-alias
```

Also add them to `INSTALLED_APPS`:

```
"djangocms_versioning",
"djangocms_alias",
```

Templates

django CMS requires at least one template for its pages, so you'll need to add *CMS_TEMPLATES* to your settings. The first template in the *CMS_TEMPLATES* list will be the project's default template.

```
CMS_TEMPLATES = [
    ('home.html', 'Home page template'),
]
```

In the root of the project, create a `templates` directory, and in that, `home.html`, a minimal django CMS template:

```
{% load cms_tags sekizai_tags %}
<html>
    <head>
        <title>{% page_attribute "page_title" %}</title>
        {% render_block "css" %}
    </head>
    <body>
        {% cms_toolbar %}
        {% placeholder "content" %}
        {% render_block "js" %}
    </body>
</html>
```

This is worth explaining in a little detail:

- `{% load cms_tags sekizai_tags %}` loads the template tag libraries we use in the template.
- `{% page_attribute "page_title" %}` extracts the page's `page_title` attribute.
- `{% render_block "css" %}` and `{% render_block "js" %}` are Sekizai template tags that load blocks of HTML defined by Django applications. django CMS defines blocks for CSS and JavaScript, and requires these two tags. We recommended placing `{% render_block "css" %}` just before the `</head>` tag, and and `{% render_block "js" %}` tag just before the `</body>`.
- `{% cms_toolbar %}` renders the *django CMS toolbar*.
- `{% placeholder "content" %}` defines a *placeholder*, where plugins can be inserted. A template needs at least one `{% placeholder %}` template tag to be useful for django CMS. The name of the placeholder is simply a descriptive one, for your reference.

Django needs to be know where to look for its templates, so add `templates` to the `TEMPLATES['DIRS']` list:

```
TEMPLATES = [
    {
        ...
        'DIRS': ['templates'],
        ...
    },
]
```

Note: The way we have set up the template here is just for illustration. In a real project, we'd recommend creating a `base.html` template, shared by all the applications in the project, that your django CMS templates can extend.

See Django's template language documentation for more on how template inheritance works.

Media and static file handling

A django CMS site will need to handle:

- *static files*, that are a core part of an application or project, such as its necessary images, CSS or JavaScript
- *media files*, that are uploaded by the site's users or applications.

`STATIC_URL` is defined (as `"/static/"`) in a new project's settings by default. `STATIC_ROOT`, the location that static files will be copied to and served from, is not required for development - only for production.

For now, using the runserver and with `DEBUG = True` in your settings, you don't need to worry about either of these.

However, `MEDIA_URL` (where media files will be served) and `MEDIA_ROOT` (where they will be stored) need to be added to your settings:

```
MEDIA_URL = "/media/"
MEDIA_ROOT = os.path.join(BASE_DIR, "media")
```

For deployment, you need to configure suitable media file serving. **For development purposes only**, the following will work in your `urls.py`:

```
from django.conf import settings
from django.conf.urls.static import static

urlpatterns = [...] + static(settings.MEDIA_URL, document_root=settings.MEDIA_ROOT)
```

(See the Django documentation for guidance on serving media files in production.)

Using `cms check` for configuration

Once you have completed the minimum required set-up described above, you can use django CMS's built-in `cms check` command to help you identify and install other components. Run:

```
python manage.py cms check
```

This will check your configuration, your applications and your database, and report on any problems.

Note: If key components are be missing, django CMS will be unable to run the `cms check command` and will simply raise an error instead.

After each of the steps below run `cms check` to verify that you have resolved that item in its checklist.

Adding content-handling functionality

You now have the basics set up for a django CMS site, which is able to manage and serve up pages. However the project so far has no plugins installed, which means it has no way of handling content in those pages. All content in django CMS is managed via plugins. So, we now need to install some additional addon applications to provide plugins and other functionality.

You don't actually **need** to install any of these. django CMS doesn't commit you to any particular applications for content handling. The ones listed here however provide key functionality and are strongly recommended.

Django Filer

Django Filer provides file and image management. Many other applications also rely on Django Filer - it's very unusual to have a django CMS site that does *not* run Django Filer. The configuration in this section will get you started, but you should refer to the Django Filer documentation for more comprehensive configuration information.

To install:

```
pip install django-filer\>=3.0
```

A number of applications will be installed as dependencies. Easy Thumbnails is required to create new versions of images in different sizes; Django MPTT manages the tree structure of the folders in Django Filer.

Pillow, the Python imaging library, will be installed. Pillow needs some system-level libraries - the Pillow documentation describes in detail what is required to get this running on various operating systems.

Add:

```
'filer',
'easy_thumbnails',
```

to `INSTALLED_APPS`.

You also need to add:

```
THUMBNAIL_HIGH_RESOLUTION = True

THUMBNAIL_PROCESSORS = (
    'easy_thumbnails.processors.colorspace',
    'easy_thumbnails.processors.autocrop',
    'filer.thumbnail_processors.scale_and_crop_with_subject_location',
    'easy_thumbnails.processors.filters'
)
```

New database tables will need to be created for Django Filer and Easy Thumbnails, so run migrations:

```
python manage.py migrate filer
python manage.py migrate easy_thumbnails
```

(or simply, `python manage.py migrate`).

Django CMS CKEditor

Django CMS CKEditor is the default rich text editor for django CMS.

Install: `pip install djangocms-text-ckeditor`.

Add `djangocms_text_ckeditor` to your `INSTALLED_APPS`.

Run migrations:

```
python manage.py migrate djangocms_text_ckeditor
```

Django CMS Frontend

Djangto CMS Frontend adds support for css frameworks to django CMS. By default, it comes with support of the Bootstrap 5 framework. However, you can use it to create your own theme using your own framework.

Install: `pip install djangocms-frontend` and it and its subpackages to `INSTALLED_APPS`:

```
INSTALLED_APPS = [
    ...,
    "easy_thumbnails',
    "djangocms_frontend',
    "djangocms_frontend.contrib.accordion",
    "djangocms_frontend.contrib.alert",
    "djangocms_frontend.contrib.badge",
    "djangocms_frontend.contrib.card",
    "djangocms_frontend.contrib.carousel",
    "djangocms_frontend.contrib.collapse",
    "djangocms_frontend.contrib.content",
    "djangocms_frontend.contrib.grid",
    "djangocms_frontend.contrib.image",
    "djangocms_frontend.contrib.jumbotron",
    "djangocms_frontend.contrib.link",
    "djangocms_frontend.contrib.listgroup",
    "djangocms_frontend.contrib.media",
    "djangocms_frontend.contrib.tabs",
    "djangocms_frontend.contrib.utilities",
    ...,
]
```

Miscellaneous plugins

There are plugins for django CMS that cover a vast range of functionality. To get started, it's useful to be able to rely on a set of well-maintained plugins that cover some general content management needs.

- djangocms-file
- djangocms-picture
- djangocms-video

- djangocms-googlemap
- djangocms-snippet
- djangocms-style

To install:

```
pip install djangocms-file djangocms-picture djangocms-video djangocms-googlemap␣
↪djangocms-snippet djangocms-style
```

and add:

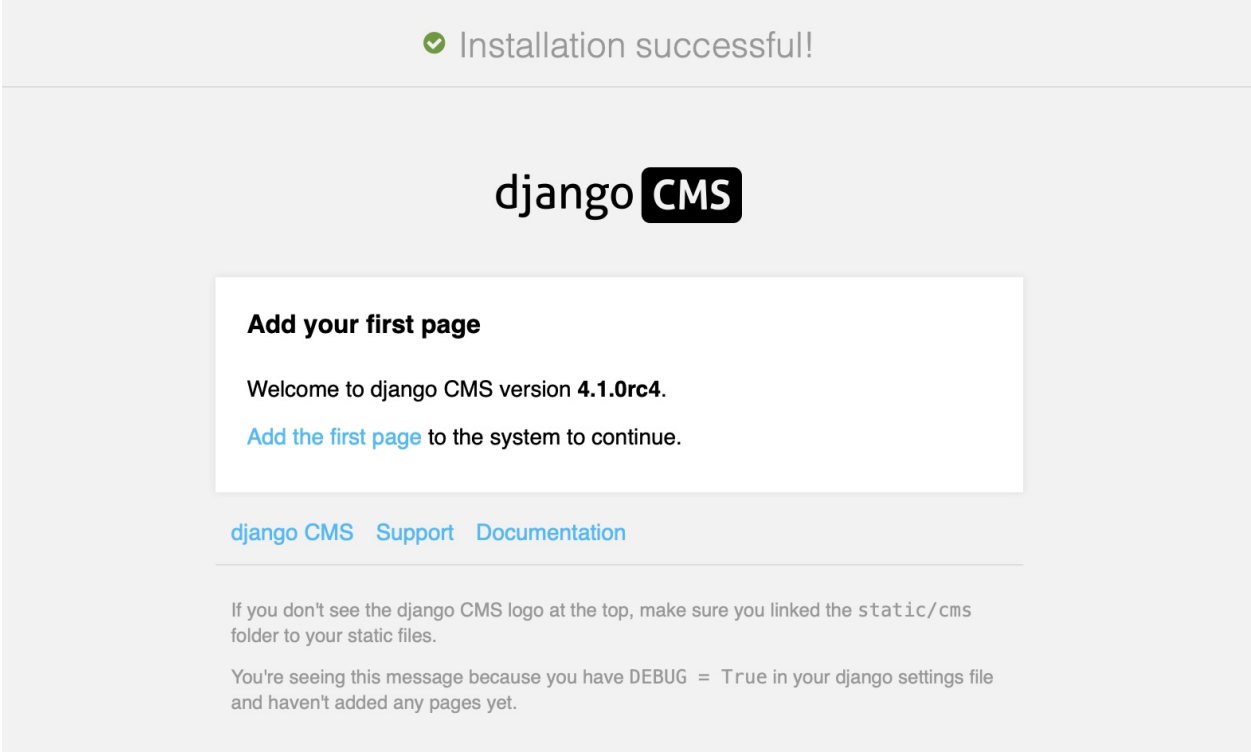
```
"djangocms_file",
"djangocms_picture",
"djangocms_video",
"djangocms_googlemap",
"djangocms_snippet",
"djangocms_style",
```

to `INSTALLED_APPS`.

Then run migrations:

```
python manage.py migrate
```

These and other plugins are described in more detail in *Some commonly-used plugins*.



Next steps

If this is your first django CMS project, read through the user guide for a walk-through of some basics.

The *tutorials for developers* will help you understand how to approach django CMS as a developer. Note that the tutorials assume you have installed the CMS using the django CMS quickstart project, but with a little adaptation you'll be able to use it as a basis.

To deploy your django CMS project on a production web server, please refer to the Django deployment documentation.

Templates & Placeholders

In this tutorial we'll introduce Placeholders, and we're also going to show how you can make your own HTML templates CMS-ready.

Templates

You can use HTML templates to customise the look of your website, define Placeholders to mark sections for managed content and use special tags to generate menus and more.

You can define multiple templates, with different layouts or built-in components, and choose them for each page as required. A page's template can be switched for another at any time.

You'll find the site's templates in `django-cms-quickstart/backend/templates`.

By default, pages in your site will use the `fullwidth.html` template, the first one listed in the project's `settings.py` `CMS_TEMPLATES` tuple:

```
CMS_TEMPLATES = [
    # a minimal template to get started with
    ('minimal.html', 'Minimal template'),

    # optional templates that extend base.html, to be used with Bootstrap 5
    ('bootstrap5.html', 'Bootstrap 5 Demo'),

    ('whitenoise-static-files-demo.html', 'Static File Demo'),
]
```

Placeholders

Placeholders are an easy way to define sections in an HTML template that will be filled with content from the database when the page is rendered. This content is edited using django CMS's frontend editing mechanism, using Django template tags.

`fullwidth.html` contains a single placeholder, `{% placeholder "content" %}`.

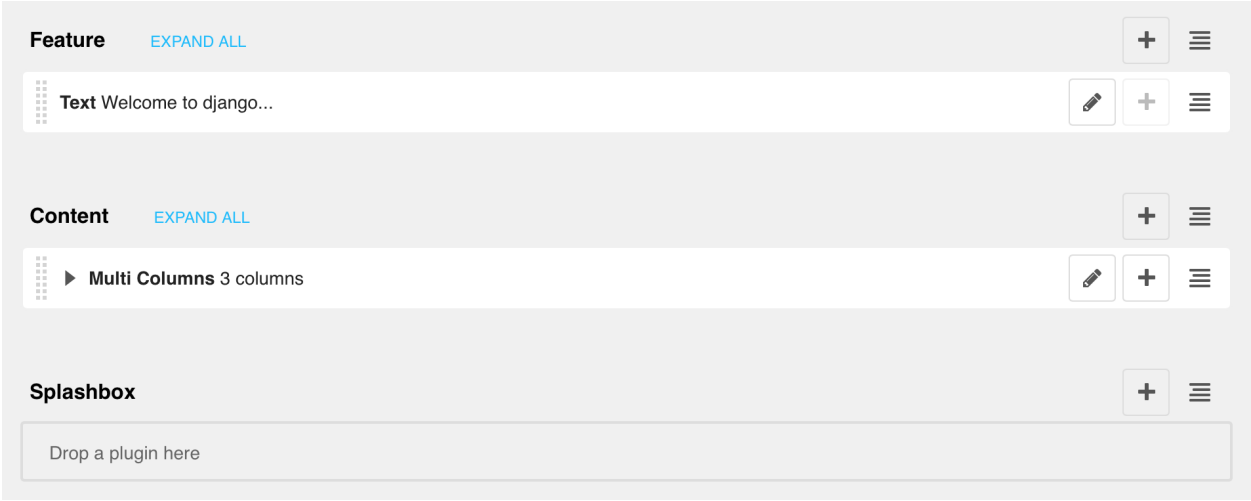
You'll also see `{% load cms_tags %}` in that file - `cms_tags` is the required template tag library.

If you're not already familiar with Django template tags, you can find out more in the Django documentation.

Add a couple of new placeholders to `fullwidth.html`, `{% placeholder "feature" %}` and `{% placeholder "splashbox" %}` inside the `{% block content %}` section. For example:

```
{% block content %}
    {% placeholder "feature" %}
    {% placeholder "content" %}
    {% placeholder "splashbox" %}
{% endblock content %}
```

If you switch to *Structure* mode (*button in the upper-right corner of the page*), you'll see the new placeholders available for use.



Static Aliases

The content of the placeholders we've encountered so far is different for every page. Sometimes though you'll want to have a section on your website which should be the same on every single page, such as a footer block.

You *could* hard-code your footer into the template, but it would be nicer to be able to manage it through the CMS. This is what **static aliases** are for. You need to install the django CMS alias package to use static aliases:

```
pip install djangocms-alias
```

Do not forget to add `djangocms_alias` to your `INSTALLED_APPS` in `settings.py`.

Static aliases are an easy way to display the same content on multiple locations on your website. Static placeholders act almost like normal placeholders, except for the fact that once a static placeholder is created and you added content to it, it will be saved globally. Even when you remove the static placeholders from a template, you can reuse them later.

So let's add a footer to all our pages. Since we want our footer on every single page, we should add it to our **base template** (`mysite/templates/base.html`). Place it near the end of the HTML `<body>` element:

```
    {% load djangocms_alias_tags %}

    <footer>
      {% static_alias 'footer' %}
    </footer>


    {% render_block "js" %}
</body>
```

Save the template and return to your browser. Refresh any page in Structure mode, then go to the "Aliases.." entry in the site menu and you'll see the new static alias listed in its category "Static alias".

introduction/images/static-alias.png

Note: Like editing of pages and aliases publishing is independent.

If you add some content to the new static placeholder in the usual way, you'll see that it appears on your site's other pages too.

Rendering Menus

In order to render the CMS's menu in your template you can use the *show_menu* tag.

Any template that uses `show_menu` must load the CMS's `menu_tags` library first:

```
{% load menu_tags %}
```

The menu we use in `mysite/templates/base.html` is:

```
<ul class="nav">
    {% show_menu 0 100 100 100 %}
</ul>
```

The options control the levels of the site hierarchy that are displayed in the menu tree - but you don't need to worry about exactly what they do at this stage.

Next we'll look at *Integrating applications*.

Integrating applications

All the following sections of this tutorial are concerned with different ways of integrating other applications into django CMS. The ease with which other applications can be built into django CMS sites is an important feature of the system.

Integrating applications doesn't merely mean installing them alongside django CMS, so that they peacefully co-exist. It means using django CMS's features to build them into a single coherent web project that speeds up the work of managing the site, and makes possible richer and more automated publishing.

It's key to the way that django CMS integration works that **it doesn't require you to modify your other applications** unless you want to. This is particularly important when you're using third-party applications and don't want to have to maintain your own forked versions of them. (The only exception to this is if you decide to build django CMS features directly into the applications themselves, for example when using *placeholders in other applications*.)

For this tutorial, we're going to take a basic Django opinion poll application and integrate it into the CMS.

So we will:

- incorporate the Polls application into the project
- create a second, independent, *Polls/CMS Integration* application to manage the integration

This way we can integrate the Polls application without having to change anything in it.

Incorporate the `polls` application

Install `polls`

Install the application from its GitHub repository using `pip`:

```
pip install git+http://git@github.com/divio/django-polls.git#egg=polls
```

Let's add this application to our project. Add `'polls'` to the end of `INSTALLED_APPS` in your project's *settings.py* (see the note on *The INSTALLED_APPS setting* about ordering).

Add the `poll` URL configuration to `urlpatterns` in the project's `urls.py`:

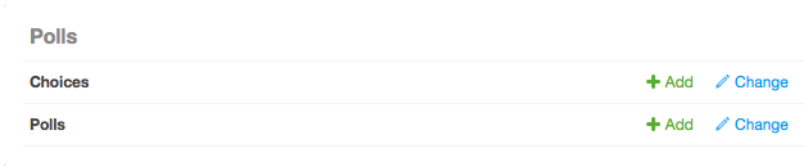
```
urlpatterns += i18n_patterns(
    re_path(r'^admin/', include(admin.site.urls)),
    re_path(r'^polls/', include('polls.urls')),
    re_path(r'^', include('cms.urls')),
)
```

Note that it must be included **before** the line for the django CMS URLs. django CMS's URL pattern needs to be last, because it "swallows up" anything that hasn't already been matched by a previous pattern.

Now run the application's migrations:

```
python manage.py migrate polls
```

At this point you should be able to log in to the Django admin - `http://localhost:8000/admin/` - and find the Polls application.



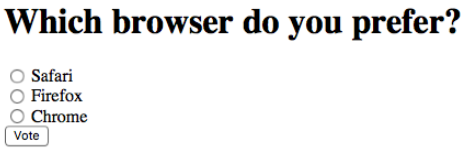
Create a new **Poll**, for example:

- **Question**: *Which browser do you prefer?*

  Choices:

  - *Safari*
  - *Firefox*
  - *Chrome*

Now if you visit `http://localhost:8000/en/polls/`, you should be able to see the poll and submit a response.



Improve the templates for Polls

You'll have noticed that in the Polls application we only have minimal templates, and no navigation or styling.

Our django CMS pages on the other hand have access to a number of default templates in the project, all of which extend one called `base.html`. So, let's improve this by overriding the polls application's base template.

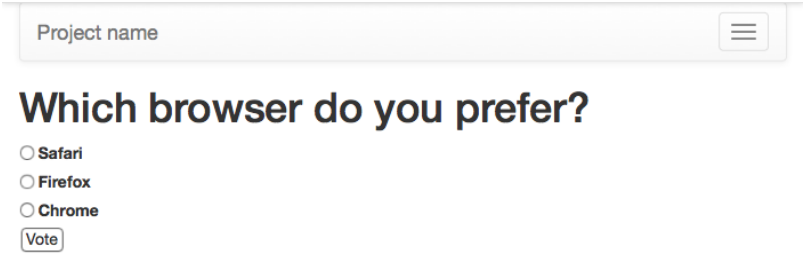
We'll do this in the *project* directory.

In `mysite/templates`, add `polls/base.html`, containing:

```
{% extends 'base.html' %}

{% block content %}
    {% block polls_content %}
    {% endblock %}
{% endblock %}
```

Refresh the `/polls/` page again, which should now be properly integrated into the site.



Set up a new `polls_cms_integration` application

So far, however, the Polls application has been integrated into the project, but not into django CMS itself. The two applications are completely independent. They cannot make use of each other's data or functionality.

Let's create the new *Polls/CMS Integration* application where we will bring them together.

Create the application

Create a new package at the project root called `polls_cms_integration`:

```
python manage.py startapp polls_cms_integration
```

Our workspace now looks like this:

```
tutorial-project/
    media/
    mysite/
    polls_cms_integration/  # the newly-created application
        __init__.py
        admin.py
        models.py
        migrations.py
        tests.py
        views.py
```

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```
    static/
    manage.py
    project.db
    requirements.txt
```

Add it to INSTALLED_APPS

Next is to integrate the `polls_cms_integration` application into the project.

Add `polls_cms_integration` to `INSTALLED_APPS` in `settings.py` - and now we're ready to use it to begin integrating Polls with django CMS. We'll start by *developing a Polls plugin*.

Note: Adding templates to the project or to the application?

Earlier, we added new templates to the project. We could equally well have have added `templates/polls/base.html` inside `polls_cms_integration`. After all, that's where we're going to be doing all the other integration work.

However, we'd now have an application that makes assumptions about the name of the template it should extend (see the first line of the `base.html` template we created) which might not be correct for a different project.

Also, we'd have to make sure that `polls_cms_integration` came *before* `polls` in `INSTALLED_APPS`, otherwise the templates in `polls_cms_integration` would not in fact override the ones in `polls`. Putting them in the project guarantees that they will override those in all applications.

Either way of doing it is reasonable, as long as you understand their implications.

Plugins

In this tutorial we're going to take a basic Django opinion poll application and integrate it into the CMS.

Create a plugin model

In the `models.py` of `polls_cms_integration` add the following:

```
from django.db import models
from cms.models import CMSPlugin
from polls.models import Poll


class PollPluginModel(CMSPlugin):
    poll = models.ForeignKey(Poll, on_delete=models.CASCADE)

    def __str__(self):
        return self.poll.question
```

This creates a plugin model class; these all inherit from the *`cms.models.pluginmodel.CMSPlugin`* base class.

Note: django CMS plugins inherit from *`cms.models.pluginmodel.CMSPlugin`* (or a sub-class thereof) and not `models.Model`.

Create and run migrations:

```
python manage.py makemigrations polls_cms_integration
python manage.py migrate polls_cms_integration
```

The Plugin Class

Now create a new file `cms_plugins.py` in the same folder your `models.py` is in. The plugin class is responsible for providing django CMS with the necessary information to render your plugin.

For our poll plugin, we're going to write the following plugin class:

```
from cms.plugin_base import CMSPluginBase
from cms.plugin_pool import plugin_pool
from polls_cms_integration.models import PollPluginModel
from django.utils.translation import gettext as _


@plugin_pool.register_plugin  # register the plugin
class PollPluginPublisher(CMSPluginBase):
    model = PollPluginModel  # model where plugin data are saved
    module = _("Polls")
    name = _("Poll Plugin")  # name of the plugin in the interface
    render_template = "polls_cms_integration/poll_plugin.html"

    def render(self, context, instance, placeholder):
        context.update({"instance": instance})
        return context
```

Note: All plugin classes must inherit from *cms.plugin_base.CMSPluginBase* and must register themselves with the *plugin_pool*.

A reasonable convention for plugin naming is:

- `PollPluginModel`: the *model* class
- `PollPluginPublisher`: the *plugin* class

A second convention is also countered quite frequently:

- `Poll`: the *model* class
- `PollPlugin`: the *plugin* class

You don't need to follow either of those convention, but choose one that makes sense and stick to it.

The template

The `render_template` attribute in the plugin class is required, and tells the plugin which *`render_template`* to use when rendering.

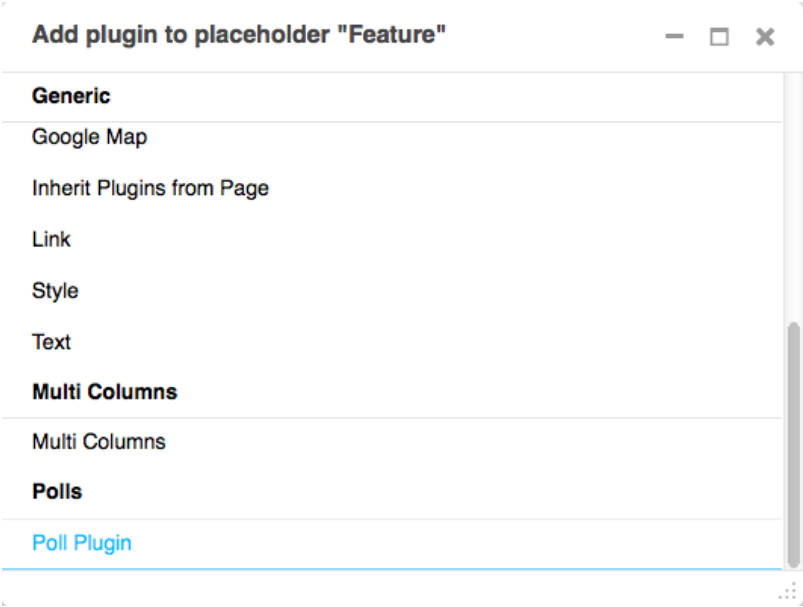
In this case the template needs to be at `polls_cms_integration/templates/polls_cms_integration/poll_plugin.html` and should look something like this:

```
<h1>{{ instance.poll.question }}</h1>

<form action="{% url 'polls:vote' instance.poll.id %}" method="post">
    {% csrf_token %}
    <div class="form-group">
        {% for choice in instance.poll.choice_set.all %}
            <div class="radio">
                <label>
                    <input type="radio" name="choice" value="{{ choice.id }}">
                    {{ choice.choice_text }}
                </label>
            </div>
        {% endfor %}
    </div>
    <input type="submit" value="Vote" />
</form>
```

Test the plugin

Now you can restart the runserver (required because you added the new `cms_plugins.py` file, and visit http://localhost:8000/.

You can now drop the `Poll Plugin` into any placeholder on any page, just as you would any other plugin.



Next we'll integrate the Polls application more fully into our django CMS project.

Apphooks

Right now, our Django Polls application is statically hooked into the project's `urls.py`. This is all right, but we can do more, by attaching applications to django CMS pages.

Create an apphook

We do this with an **apphook**, created using a *CMSApp* sub-class, which tells the CMS how to include that application.

Create the apphook class

Apphooks live in a file called `cms_apps.py`, so create one in your Polls/CMS Integration application, i.e. in `polls_cms_integration`.

This is a very basic example of an apphook for a django CMS application:

```
from cms.app_base import CMSApp
from cms.apphook_pool import apphook_pool


@apphook_pool.register  # register the application
class PollsApphook(CMSApp):
    app_name = "polls"
    name = "Polls Application"

    def get_urls(self, page=None, language=None, **kwargs):
        return ["polls.urls"]
```

Alternatively, you can also specify the URL patterns directly, for instance:

```
from django.urls import path
from polls import views

...


class PollsApphook(CMSApp):
    ...

    def get_urls(self, page=None, language=None, **kwargs):
        return [
            path("<int:pk>/results/", views.ResultsView.as_view(), name=
↪"results"),
            path("<int:pk>/vote/", views.vote, name="vote"),
            path("<int:pk>/", views.DetailView.as_view(), name="detail"),
            path("", views.IndexView.as_view(), name="index"),
        ]
```

In this `PollsApphook` class, we have done several key things:

- `app_name` this optional attribute gives the system a unique way to refer to the apphook. It is used the create a reverse mapping for the URL's namespace.

- `name` is a human-readable name, and will be displayed to the user in the *Advanced settings* of the CMS pages attaching to this apphook.
- `get_urls()` method is what actually hooks the application in, returning a list of URL configurations that will be made active wherever the apphook is used - in this case, it will either use the `urls.py` from `polls`, or declare its own list of URL patterns.

Remove the old `polls` entry from the project's `urls.py`

You must now remove the entry for the Polls application:

```
path('polls/', include('polls.urls', namespace='polls'))
```

from your project's `urls.py`.

Not only is it not required there, because we reach the polls via the apphook instead, but if you leave it there, it will conflict with the apphook's URL handling. You'll receive a warning in the logs:

```
URL namespace 'polls' isn't unique. You may not be able to reverse all URLs in this␣
↪namespace.
```

Restart the runserver

Restart the runserver. This is necessary because we have created a new file containing Python code that won't be loaded until the server restarts. You have to restart the server each time you want to apply a modification made to this file or any views attached to thereof.

Restarting the server after a change can be prevented, if the *cms.middleware.utils.ApphookReloadMiddleware* has been added to the `MIDDLEWARE` in your `settings.py`.

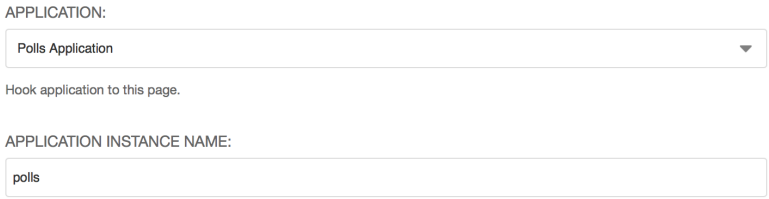
Apply the apphook to a page

Now we need to create a new page, and attach the Polls application to it through this apphook.

Create and save a new page.

Note: Your apphook only will work for languages you have created a page content object.

In its *Advanced settings* (from the toolbar, select *Page* > *Advanced settings…*) choose "Polls Application" from the *Application* pop-up menu, and save once more.



Refresh the page, and you'll find that the Polls application is now available directly from the new django CMS page.

Important: Don't add child pages to a page with an apphook.

The apphook "swallows" all URLs below that of the page, handing them over to the attached application. If you have any child pages of the apphooked page, django CMS will not be able to serve them reliably.

Extending the toolbar

django CMS allows you to control what appears in the toolbar. This allows you to integrate your application in the frontend editing mode of django CMS and provide your users with a streamlined editing experience.

In this section of the tutorial, we will add a new *Polls* menu to the toolbar.

Add a basic `PollToolbar` class

We'll add various controls to the toolbar, using a `cms.toolbar_base.CMSToolbar` sub-class.

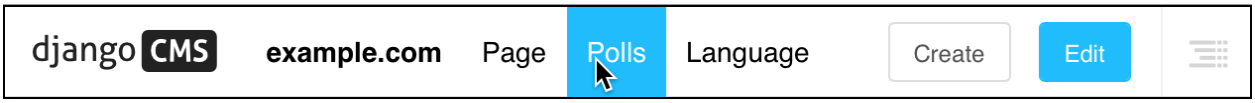
Add a menu to the toolbar

Start by adding a new file, `cms_toolbars.py`, to your Polls/CMS Integration application, and create the `CMSToolbar` class:

```
from cms.toolbar_base import CMSToolbar
from cms.toolbar_pool import toolbar_pool
from polls.models import Poll


class PollToolbar(CMSToolbar):

    def populate(self):
        self.toolbar.get_or_create_menu(
            'polls_cms_integration-polls',  # a unique key for this menu
            'Polls',                        # the text that should appear in the menu
            )


# register the toolbar
toolbar_pool.register(PollToolbar)
```

Note: Don't forget to restart the runserver to have your new `cms_toolbars.py` file recognised.

You will now find, in every page of the site, a new item in the toolbar:



The `populate()` method is what gets called when the toolbar is built. In it, we're using *`get_or_create_menu()`* to add a *Polls* item to the toolbar.

Add nodes to the *Polls* menu

So far, the *Polls* menu is empty. We can extend `populate()` to add some items. `get_or_create_menu` returns a menu that we can manipulate, so let's change the `populate()` method to add an item that allows us to see the full list of polls in the sideframe, with *add_sideframe_item()*.

```
from cms.utils.urlutils import admin_reverse
[...]


class PollToolbar(CMSToolbar):

    def populate(self):
        menu = self.toolbar.get_or_create_menu('polls_cms_integration-polls', 'Polls')

        menu.add_sideframe_item(
            name='Poll list',                              # name of the new menu item
            url=admin_reverse('polls_poll_changelist'),    # the URL it should open with
        )
```

After refreshing the page to load the changes, you can now see the list of polls directly from the menu.

Also useful would be an option to create new polls. We'll use a modal window for this, invoked with *add_modal_item()*. Add the new code to the end of the `populate()` method:

```
class PollToolbar(CMSToolbar):

    def populate(self):
        [...]

        menu.add_modal_item(
            name='Add a new poll',                # name of the new menu item
            url=admin_reverse('polls_poll_add'),  # the URL it should open with
        )
```

Add buttons to the toolbar

As well as menus, you can add buttons to the toolbar in a very similar way. Rewrite the `populate()` method, noting how closely the structure of this code matches that for adding menus.

```
def populate(self):

    buttonlist = self.toolbar.add_button_list()

    buttonlist.add_sideframe_button(
        name='Poll list',
        url=admin_reverse('polls_poll_changelist'),
    )

    buttonlist.add_modal_button(
        name='Add a new poll',
        url=admin_reverse('polls_poll_add'),
    )
```

Further refinements

The buttons and menu for Polls appear in the toolbar everywhere in the site. It would be useful to restrict this to pages that are actually relevant.

The first thing to add is a test right at the start of the `populate()` method:

```
    def populate(self):

        if not self.is_current_app:
            return

        [...]
```

The `is_current_app` flag tells us if the function handling this view (e.g. the list of polls) belongs to the same application as the one responsible for this toolbar menu.

Often, this can be detected automatically, but in this case, the view belongs to the `polls` application, whereas the toolbar menu belongs to `polls_cms_integration`. So, we need to tell the `PollToolbar` class explicitly that it's actually associated with the `polls` application:

```
class PollToolbar(CMSToolbar):

    supported_apps = ['polls']
```

Now, the buttons/menu will only appear in relevant pages.

The complete `cms_toolbars.py`

For completeness, here is the full example:

```
from cms.utils.urlutils import admin_reverse
from cms.toolbar_base import CMSToolbar
from cms.toolbar_pool import toolbar_pool
from polls.models import Poll


class PollToolbar(CMSToolbar):
    supported_apps = ['polls']

    def populate(self):

        if not self.is_current_app:
            return

        menu = self.toolbar.get_or_create_menu('polls_cms_integration-polls', 'Polls')

        menu.add_sideframe_item(
            name='Poll list',
            url=admin_reverse('polls_poll_changelist'),
        )

        menu.add_modal_item(
```

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```
            name=('Add a new poll'),
            url=admin_reverse('polls_poll_add'),
        )

        buttonlist = self.toolbar.add_button_list()

        buttonlist.add_sideframe_button(
            name='Poll list',
            url=admin_reverse('polls_poll_changelist'),
        )

        buttonlist.add_modal_button(
            name='Add a new poll',
            url=admin_reverse('polls_poll_add'),
        )

toolbar_pool.register(PollToolbar)  # register the toolbar
```

This is just a basic example, and there's a lot more to django CMS toolbar classes than this - see *How to extend the Toolbar* for more.

Extending the navigation menu

You may have noticed that while our Polls application has been integrated into the CMS, with plugins, toolbar menu items and so on, the site's navigation menu is still only determined by django CMS Pages.

We can hook into the django CMS menu system to add our own nodes to that navigation menu.

Create the navigation menu

We create the menu using a `CMSAttachMenu` sub-class, and use the `get_nodes()` method to add the nodes.

For this we need a file called `cms_menus.py` in our application. Add `cms_menus.py` in `polls_cms_integration/`:

```
from django.urls import reverse
from django.utils.translation import gettext_lazy as _

from cms.menu_bases import CMSAttachMenu
from menus.base import NavigationNode
from menus.menu_pool import menu_pool

from polls.models import Poll


class PollsMenu(CMSAttachMenu):
    name = _("Polls Menu")  # give the menu a name this is required.

    def get_nodes(self, request):
        """
        This method is used to build the menu tree.
        """
```

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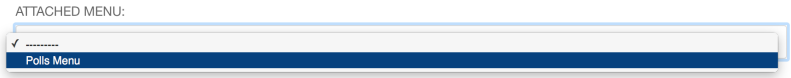
```
        nodes = []
        for poll in Poll.objects.all():
            node = NavigationNode(
                title=poll.question,
                url=reverse("polls:detail", args=(poll.pk,)),
                id=poll.pk,  # unique id for this node within the menu
            )
            nodes.append(node)
        return nodes


menu_pool.register_menu(PollsMenu)
```

What's happening here:

- we define a `PollsMenu` class, and register it
- we give the class a `name` attribute (will be displayed in admin)
- in its `get_nodes()` method, we build and return a list of nodes, where:
- first we get all the `Poll` objects
- … and then create a `NavigationNode` object from each one
- … and return a list of these `NavigationNodes`

This menu class won't actually do anything until attached to a page. In the *Advanced settings* of the page to which you attached the apphook earlier, select "Polls Menu" from the list of *Attached menu* options, and save once more. (You could add the menu to any page, but it makes most sense to add it to this page.)



You can force the menu to be added automatically to the page by the apphook if you consider this appropriate. See *Adding menus to apphooks* for information on how to do that.

Note: The point here is to illustrate the basic principles. In this actual case, note that:

- If you're going to use sub-pages, you'll need to improve the menu styling to make it work a bit better.
- Since the Polls page lists all the Polls in it anyway, this isn't really the most practical addition to the menu.

Content creation wizards

Content creation wizards allow you to make use of the toolbar's **Create** button in your own applications. It opens up a simple dialog box with the basic fields required to create a new item.

django CMS uses it for creating Pages, but you can add your own models to it.

In the `polls_cms_integration` application, add a `forms.py` file:

```
from django import forms

from polls.models import Poll
```

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```
class PollWizardForm(forms.ModelForm):
    class Meta:
        model = Poll
        exclude = []
```

Then add a `cms_wizards.py` file, containing:

```
from cms.wizards.wizard_base import Wizard
from cms.wizards.wizard_pool import wizard_pool

from polls_cms_integration.forms import PollWizardForm


class PollWizard(Wizard):
    pass

poll_wizard = PollWizard(
    title="Poll",
    weight=200,  # determines the ordering of wizards in the Create dialog
    form=PollWizardForm,
    description="Create a new Poll",
)

wizard_pool.register(poll_wizard)
```

Refresh the Polls page, hit the **Create** button in the toolbar - and the wizard dialog will open, offering you a new wizard for creating Polls.

Note: Once again, this particular example is for illustration only. In the case of a Poll, with its multiple Questions associated with it via foreign keys, we really want to be able to edit those questions at the same time too.

That would require a much more sophisticated form and processing than is possible within the scope of this tutorial.

If you want to install django CMS into an existing project, or prefer to configure django CMS by hand, rather than using the django CMS quistart project, see *Installing django CMS* and then follow the rest of the tutorials.

Either way, you'll be able to find support and help from the numerous friendly members of the django CMS community on our Slack group.

5.2.2 Explanation

This section explains and analyses some key concepts in django CMS. It's less concerned with explaining *how to do things* than with helping you understand *how it works*.

Plugins

See also:

- *Plugins how-to guide*

CMS Plugins are reusable content publishers that can be inserted into django CMS pages (or indeed into any content that uses django CMS placeholders). They enable the publishing of information automatically, without further intervention.

This means that your published web content, whatever it is, is kept up-to-date at all times.

It's like magic, but quicker.

Unless you're lucky enough to discover that your needs can be met by the built-in plugins, or by the many available third-party plugins, you'll have to write your own custom CMS Plugin.

Why would you need to write a plugin?

A plugin is the most convenient way to integrate content from another Django application into a django CMS page.

For example, suppose you're developing a site for a record company in django CMS. You might like to have a "Latest releases" box on your site's home page.

Of course, you could every so often edit that page and update the information. However, a sensible record company will manage its catalogue in Django too, which means Django already knows what this week's new releases are.

This is an excellent opportunity to make use of that information to make your life easier - all you need to do is create a django CMS plugin that you can insert into your home page, and leave it to do the work of publishing information about the latest releases for you.

Plugins are **reusable**. Perhaps your record company is producing a series of reissues of seminal Swiss punk records; on your site's page about the series, you could insert the same plugin, configured a little differently, that will publish information about recent new releases in that series.

Components of a plugin

A django CMS plugin is fundamentally composed of three components, that correspond to Django's familiar Model-View-Template scheme:

What	Function	Subclass of
model (if required)	plugin instance configuration	`CMSPlugin`
view	display logic	`CMSPluginBase`
template	rendering	–

`CMSPlugin`

The plugin **model**, the sub-class of `cms.models.pluginmodel.CMSPlugin`, is optional.

You could have a plugin that doesn't need to be configured, because it only ever does one thing.

For example, you could have a plugin that only publishes information about the top-selling record of the past seven days. Obviously, this wouldn't be very flexible - you wouldn't be able to use the same plugin for the best-selling release of the last *month* instead.

Usually, you find that it is useful to be able to configure your plugin, and this will require a model.

CMSPluginBase

cms.plugin_base.CMSPluginBase is actually a sub-class of `django.contrib.admin.ModelAdmin`.

Because *CMSPluginBase* sub-classes `ModelAdmin` several important `ModelAdmin` options are also available to CMS plugin developers. These options are often used:

- `exclude`
- `fields`
- `fieldsets`
- `form`
- `formfield_overrides`
- `inlines`
- `radio_fields`
- `raw_id_fields`
- `readonly_fields`

Please note, however, that not all `ModelAdmin` options are effective in a CMS plugin. In particular, any options that are used exclusively by the `ModelAdmin`'s `changelist` will have no effect. These and other notable options that are ignored by the CMS are:

- `actions`
- `actions_on_top`
- `actions_on_bottom`
- `actions_selection_counter`
- `date_hierarchy`
- `list_display`
- `list_display_links`
- `list_editable`
- `list_filter`
- `list_max_show_all`
- `list_per_page`
- `ordering`
- `paginator`
- `prepopulated_fields`
- `preserve_fields`
- `save_as`
- `save_on_top`
- `search_fields`
- `show_full_result_count`
- `view_on_site`

Application hooks ("apphooks")

An Application Hook, usually simply referred to as an apphook, is a way of attaching the functionality of some other application to a django CMS page. It's a convenient way of integrating other applications into a django CMS site.

For example, suppose you have an application that maintains and publishes information about Olympic records. You could add this application to your site's `urls.py` (before the django CMS URLs pattern), so that users will find it at `/records`.

However, although it would thus be integrated into your *project*, it would not be fully integrated into django CMS, for example:

- django CMS would not be aware of it, and - for example - would allow your users to create a CMS page with the same `/records` slug, that could never be reached.
- The application's pages won't automatically appear in your site's menus.
- The application's pages won't be able to take advantage of the CMS's publishing workflow, permissions or other functionality.

Apphooks offer a more complete way of integrating other applications, by attaching them to a CMS page. In this case, the attached application takes over the page and its URL (and all the URLs below it, such as `/records/1984`).

The application can be served at a URL defined by the content managers, and easily moved around in the site structure.

The *Advanced settings* of a CMS page provides an *Application* field. *Adding an apphook class* to the application will allow it to be selected in this field.

Multiple apphooks per application

It's possible for an application to be added multiple times, to different pages. See *Attaching an application multiple times* for more.

Also possible to provide **multiple apphook configurations**:

Apphook configurations

You may require the same application to behave differently in different locations on your site. For example, the Olympic Records application may be required to publish athletics results at one location, but cycling results at another, and so on.

An *apphook configuration* class allows the site editors to create multiple configuration instances that specify the behaviour. The kind of configuration available is presented in an admin form, and determined by the application developer.

Important: It's important to understand that an apphook (and therefore also an apphook configuration) serves no function until it is attached to a page - and until the page is **published**, the application will be unable to fulfil any publishing function.

Also note that the apphook "swallows" all URLs below that of the page, handing them over to the attached application. If you have any child pages of the apphooked page, django CMS will not be able to serve them reliably.

Publishing

Without an additional package installed that supports versioning all django CMS pages are published by default. This means they are visible to the public the moment you save them. Accordingly, all changes you make are visible immediately.

djangocms-versioning is a general purpose package that manages versions within different categories, like **published**, **draft**, **unpublished**, or **archived**. django CMS, however, is not restricted to work with djangocms-versioning. You can use other versioning packages or come up with your own either from scratch or by forking djangocms-versioning.

This section gives a short introduction on how to work with djangocms-versioning. For details please consult the djangocms-versioning documentation.

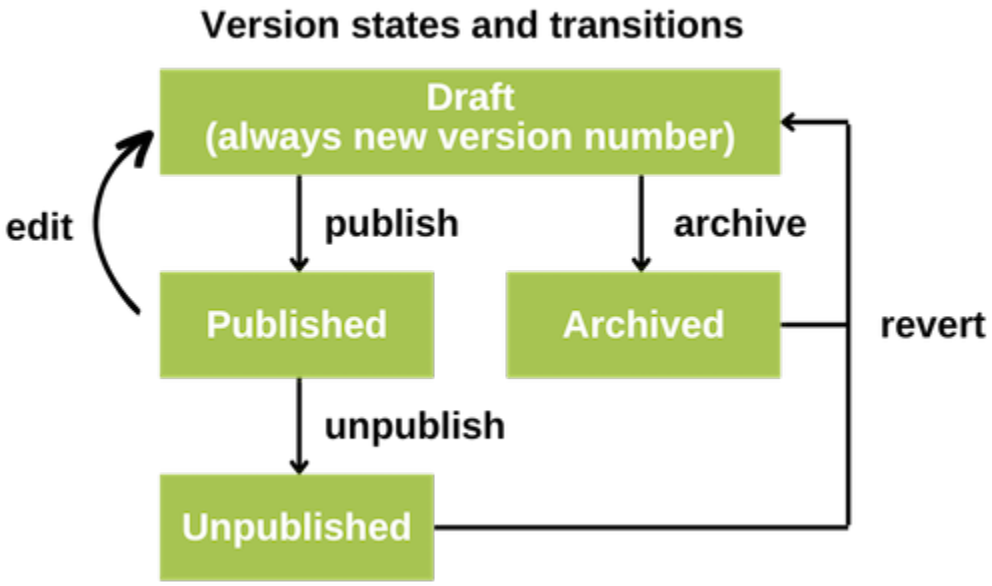
Also, while this section focuses on pages, djangocms-versioning can lend its versioning capabilities to other objects, too, e.g., aliases as defined in djangocms-alias.

Version states

Each `Page` object can have many `PageContent` objects assigned actually containing the page's content (hence the name) in a specific language. Djangocms-versioning extends this relationship by allowing more `PageContent` objects to carry a version number and version state. The states are:

- **draft**: This is the version which currently can be edited. Only draft versions can be edited and only one draft version per language is allowed. Changes made to draft pages are not visible to the public.
- **published**: This is the version currently visible on the website to the public. Only one version per language can be public. It cannot be changed. If it needs to be changed a new draft is created based on a published page and the published page stays unchanged.
- **unpublished**: This is a version which was published at one time but now is not visible to the public any more. There can be many unpublished versions.
- **archived**: This is a version which has not been published and therefore has never been visible to the public. It represents a state which is intended to be used for later work (by reverting it to a draft state).

Each new draft version will generate a new version number.



When a page is published, it is publicly visible even if its parent pages are not published.

Code and PageContent

When handling *PageContent* in code, you'll generally only "see" published pages:

```
PageContent.objects.filter(language="en")   # get all published English page contents
```

will only give published pages. This is to ensure that no draft or unpublished versions leaks or become visible to the public.

Since often draft page contents are the ones you interact with in the admin interface, or in draft mode in the CMS frontend, djangocms-versioning introduces an additional model manager for the PageContents **which may only be used on admin sites and admin forms**:

```
PageContent.admin_manager.filter(page=my_page, language="en")
```

will retrieve page content objects of all versions. Alternatively, to get the current draft version you can to filter the `Version` object:

```
from djangocms_versioning.constants import DRAFT
from djangocms_versioning.models import Version

version = Version.objects.get(content__page=my_page, content__language="en",␣
↪status=DRAFT)
draft_content = Version.content
```

Finally, there are instance where you want to access the "current" version of a page. This is either the current draft version or - there is no draft - the published version. You can easily achieve this by using:

```
for content in PageContent.admin_manager.filter(page=my_page).current_content():
    # iterates over the current (draft or published) version of all languages of my page
    if content.versions.first().state == DRAFT:
        # do something
```

For more details see the documentation of djangocms-versioning!

Serving content in multiple languages

Basic concepts

django CMS has a sophisticated multilingual capability. It is able to serve content in multiple languages, with fallbacks into other languages where translations have not been provided. It also has the facility for the user to set the preferred language and so on.

How django CMS determines the user's preferred language

django CMS determines the user's language the same way Django does it.

- the language code prefix in the URL
- the language set in the session
- the language in the language cookie
- the language that the browser says its user prefers

It uses the django built in capabilities for this.

By default no session and cookie are set. If you want to enable this use the *cms.middleware.language.LanguageCookieMiddleware* to set the cookie on every request.

How django CMS determines what language to serve

Once it has identified a user's language, it will try to accommodate it using the languages set in `CMS_LANGUAGES`.

If `fallbacks` is set, and if the user's preferred language is not available for that content, it will use the fallbacks specified for the language in `CMS_LANGUAGES`.

What django CMS shows in your menus

If `hide_untranslated` is `True` (the default) then pages that aren't translated into the desired language will not appear in the menu.

Internationalisation

django CMS excels in its multilingual support, and can be configured to handle a vast range of different requirements. Its behaviour is flexible and can be controlled at a granular level in `CMS_LANGUAGES`. Other *Internationalisation and localisation (I18N and L10N)* settings offer further control.

See *How to serve multiple languages* on how to set up a multilingual django CMS project.

URLs

Multilingual URLs require the use of `i18n_patterns()`. For more information about this see the official Django documentation on the subject. *Multilingual URLs* describes what you need to do in a django CMS project.

How django CMS determines which language to serve

django CMS uses a number of standard Django mechanisms to choose the language for the user, in the following order of preference:

- language code in the URL - for example, `http://example.com/de` (when multilingual URLs are enabled)
- language stored in the browsing session
- language stored in a cookie from a previous session
- language requested by the browser in the `Accept-Language` header

- the default `LANGUAGE_CODE` in the site's settings

More in-depth documentation about this is available at https://docs.djangoproject.com/en/dev/topics/i18n/translation/#how-django-discovers-language-preference

Permissions

The django CMS permissions system is flexible, granular and multi-layered.

Permission modes

Permissions operate in two different modes, depending on the *CMS_PERMISSION* setting.

- Simple permissions mode (`CMS_PERMISSION = False`): only the standard Django Users and Groups permissions will apply. This is the default.
- Page permissions mode (`CMS_PERMISSION = True`): as well as standard Django permissions, django CMS provides row-level permissions on pages, allowing you to control the access of users to different sections of a site, and sites within a multi-site project.

Key user permissions

You can find the permissions you can set for a user or groups in the Django admin, in the *Authentication and Authorization* section. These apply equally in Simple permissions mode and Page permissions mode.

Filtering by `cms` will show the ones that belong to the CMS application. Permissions that a CMS editor will need are likely to include:

- `cms | cms plugin`
- `cms | page`
- `cms | placeholder`
- `cms | placeholder reference`
- `cms | static placeholder`
- `cms | placeholder reference`
- `cms | title`

Most of these offer the usual add/change/delete options, though there are some exceptions, such as `cms | placeholder | Can use Structure mode`.

See *Use permissions on Groups, not on Users* below on applying permissions to groups rather than users.

Permissions in Page permissions mode

In Page permissions mode, you also need to give users permission to the right pages and sub-sites.

Global and per-page permissions

This can be done in two ways, *globally* or *per-page*.

Global page permissions apply to all pages (or all pages on a sub-site in a multi-site project). Global page permissions are managed in the admin at *django CMS > Pages global permissions*.

Per-page permissions apply to a specific page and/or its children and/or its descendants. Per-page permissions are managed via the toolbar (*Page > Permissions*) when on the page in question, in edit mode.

Your users (unless they are Django superusers) will need at least one of global page permissions or per-page permissions granted to them in order to be able to edit any pages at all.

They will **also** need appropriate *user permissions*, otherwise they will have no edit rights to pages.

Page permission options

Both global page permissions and per-page permissions can be assigned to users or groups of users. They include:

- *Can add*
- *Can edit*
- *Can delete*
- *Can publish*
- *Can change advanced settings*
- *Can change permissions*
- *Can move*

  Even though a user may have *Can edit* permissions on a page, that doesn't give them permissions to add or change plugins *within* that page. In order to be able to add/change/delete plugins on any page, you will need to go through *the standard Django permissions* to provide users with the actions they can perform, for example:

  - `cms | page | Can publish page` to publish it
  - `cms | cms plugins | Can edit cms plugin` to edit plugins on the page

Per-page permissions

Per-page permissions are controlled by selecting *Permissions* from the *Page* menu in the toolbar when on the page (this options is only available when `CMS_PERMISSION` mode is on).

Login required determines whether anonymous visitors will be able to see the page at all.

Menu visibility determines who'll be able to see the page in navigation menus - everyone, or logged in or anonymous users only.

View restrictions determine which groups and users will be able to see the page when it is published. Adding a view restriction will allow you to set this. Note that this doesn't apply any restrictions to users who are also editors with appropriate permissions.

Page permissions determine what editors can do to a page (or hierarchy of pages). They are described above in *Page permission options*.

New admin models

When `CMS_PERMISSION` is enabled, as well as *Pages global permissions* you will find two new models available in the CMS admin:

- *User groups (page)*
- *Users (page)*

You will find that the latter two simply reflect the Django Groups and User permissions that already exist in the system, and can be ignored.

Permission strategies

For a simple site with only a few users you may not need to be concerned about this, but with thousands of pages belonging to different departments and users with greatly differing levels of authority and expertise, it is important to understand who is able to do what on your site.

Use permissions on Groups, not on Users

Avoid applying permissions to individual users unless strictly necessary. It's far better to apply them to Groups, and add Users to Groups. Otherwise, you risk ending up with large numbers of Users with unknown or inappropriate permissions.

Use Groups to build up permissions

Different users may require different subsets of permissions. For example, you could define a *Basic content editor* group, who can edit and publish pages and content, but who don't have permission to create new ones; that permission would be granted to a *Lead content editor* Group. Another Group could have permissions to use the weblog.

Then, when managing a user, place the user into the appropriate groups.

Two dimensions of permissions

You can divide your users' permissions across two dimensions:

- what sort of things this user or group of user should be allowed to do (e.g. publish pages, add new plugins, create new users, etc)
- which sections of the site the user should be allowed to do them on (the home page, a limited set of departmental pages, etc)

Groups are very useful for managing this. For example, you can create a *Europe* group for editors who are allowed to edit the Europe page hierarchy or sub-site. The group can then be added to a *global or per-page permission*.

Using touch-screen devices with django CMS

Important: These notes about touch interface support apply only to the **django CMS admin and editing interfaces**. The visitor-facing published site is **wholly independent** of this, and the responsibility of the site developer.

General

django CMS has made extensive use of double-click functionality, which lacks an exact equivalent in touch-screen interfaces. The touch interface will interpret taps and touches in an intelligent way.

Depending on the context, a tap will be interpreted to mean *open for editing* (that is, the equivalent of a double-click), or to mean *select* (the equivalent of a single click), according to what makes sense in that context.

Similarly, in some contexts similar interactions may *drag* objects, or may *scroll* them, depending on what makes most sense. Sometimes, the two behaviours will be present in the same view, for example in the page list, where certain areas are draggable (for page re-ordering) while other parts of the page can be used for scrolling.

In general, the chosen behaviour is reasonable for a particular object, context or portion of the screen, and in practice is quicker and easier to apprehend simply by using it than it is to explain.

Pop-up help text will refer to clicking or tapping depending on the device being used.

Be aware that some hover-related user hints are simply not available to touch interface users.

Device support

Smaller devices such as most phones are too small to be adequately usable. For example, your Apple Watch is sadly unlikely to provide a very good django CMS editing experience.

Older devices will often lack the performance to support a usefully responsive frontend editing/administration interface.

The following devices are known to work well, so newer devices and more powerful models should also be suitable:

- iOS: Apple iPad Air 1, Mini 4
- Android: Sony Xperia Z2 Tablet, Samsung Galaxy Tab 4
- Windows 10: Microsoft Surface

We welcome feedback about specific devices.

Your site's frontend

django CMS's toolbar and frontend editing architecture rely on good practices in your own frontend code. To work well with django CMS's responsive management framework, your own site should be friendly towards multiple devices.

Whether you use your own frontend code or a framework such as Bootstrap 3 or Foundation, be aware that problems in your CSS or markup can affect django CMS editing modes, and this will become especially apparent to users of mobile/hand-held devices.

Known issues

General issues

- Editing links that lack sufficient padding is currently difficult or impossible using touch-screens.
- Similarly, other areas of a page where the visible content is composed entirely of links with minimal padding around them can be difficult or impossible to open for editing by tapping. This can affect the navigation menu (double-clicking on the navigation menu opens the page list).
- Adding links is known to be problematic on some Android devices, because of the behaviour of the keyboard.
- On some devices, managing django CMS in the browser's *private* (also known as *incognito*) mode can have significant performance implications.

  This is because local storage is not available in this mode, and user state must be stored in a Django session, which is much less efficient.

  This is an unusual use case, and should not affect many users.

CKEditor issues

- Scrolling on narrow devices, especially when opening the keyboard inside the CKEditor, does not always work ideally - sometimes the keyboard can appear in the wrong place on-screen.
- Sometimes the CKEditor moves unexpectedly on-screen in use.
- Sometimes in Safari on iOS devices, a rendering bug will apparently truncate or reposition portions of the toolbar when the CKEditor is opened - even though sections may appear to missing or moved, they can still be activated by touching the part of the screen where they should have been found.

Django Admin issues

- In the page tree, the first touch on the page opens the keyboard which may be undesirable. This happens because Django automatically focuses the search form input.

Color schemes (light/dark) with django CMS

Important: These notes about the color scheme apply only to the **django CMS admin and editing interfaces**. The visitor-facing published site is **wholly independent** of this, and the responsibility of the site developer.

The admin interfaces will only reflect the described behavior if the package `djangocms-admin-style` is installed (version 3.2 or later). If it is not installed, the admin interface is managed by your underlying Django installation, which usually uses the browser's color scheme.

Setting the color scheme

Django CMS' default color scheme is `"light"`. To change the color scheme use the `CMS_COLOR_SCHEME` setting in your project's `setting.py`:

`CMS_COLOR_SCHEME = "light"`
This is the default appearance and shows the interface with dark text on a white background.

`CMS_COLOR_SCHEME = "dark"`
This so-called dark mode shows light text on a dark background.

`CMS_COLOR_SCHEME = "auto"`
The auto mode chooses either light or dark color scheme based on the browser or operating system setting of the user.

Hint: If you plan to fix the color scheme to either light or dark, add a corresponding `data-theme` attribute to the `html` tag in your base template, e.g.

```
<html data-theme="light">
```

This will pin the color scheme early when loading pages and avoid potential flickering if the browser preference differs from the `CMS_COLOR_SCHEME` setting.

Changed in version 3.11.4: Before version 3.11.4 the color scheme was set by `data-color-scheme`. Since version 3.11.4 django CMS uses `data-theme` just as Django since version 4.2.

Important: Not all plugin admin interfaces might support a dark color scheme, especially if plugin forms contain custom widgets.

Toggle button for the color scheme

The setting `CMS_COLOR_SCHEME_TOGGLE` in the project's `settings.py` determines if a toggle icon (sun/moon/auto) is shown in the toolbar. It allows a user to switch their color scheme for their session.

By default, `CMS_COLOR_SCHEME_TOGGLE` is set to `True`.

Make your own admin CSS color scheme aware

Plugin forms or any admin forms use Django's admin app which itself supports light and dark color schemes. djangocms-admin-style introduces django CMS' color scheme to the admin app. Just as Django does, djangocms-admin-style defines CSS variables for frequent colors.

We recommend writing at least your reusable apps in a way which allows them to respect the color scheme with djangocms-admin-style and with Django's admin style.

Here are some recommendations for making your app work as seamlessly as possible:

- Try avoiding using `color`, `background-color`, or other color styles where possible and meaningful.
- If necessary, use as few as possible standard django CMS colors (preferably from the list below with plain Django fallback colors)

- Use the following pattern: `var(--dca-color-var, var(--fallback-color-var, #xxxxxx))` where `#xxxxxx` represents the light version of the color. This tries django CMS color scheme first and falls back to Django color scheme if djangocms-admin-style is not available.
- Avoid media queries like `@media (prefers-color-scheme: dark)` since they would ignore forced settings to light or dark.

The admin frontend pulls the style from django admin styles and - if present - from djangocms-admin-style. Django itself also uses CSS variables to implement admin mode, these can be used as dark mode-aware fall-back colors.

Here's a table of django CMS' CSS color variables and their Django fallbacks:

Variable name	Color	Fallback	Color
`--dca-white`	`#ffffff`	`--body-bg`	`#ffffff`
`--dca-gray`	`#666`	`--body-quiet-color`	`#666`
`--dca-gray-lightest`	`#f2f2f2`	`--darkened-bg`	`#f8f8f8`
`--dca-gray-lighter`	`#ddd`	`--border-color`	`#ccc`
`--dca-gray-light`	`#999`	`--close-button-bg`	`#888`
`--dca-gray-darker`	`#454545`		
`--dca-gray-darkest`	`#333`		
`--dca-gray-super-lightest`	`#f7f7f7`		
`--dca-primary`	`#00bbff`	`--primary`	`#79aec8`
`--dca-black`	`#000`	`--body-fg`	`#303030`

This leaves these recommendations for color scheme dependent colors:

```
white:          var(--dca-white, var(--body-bg, #fff))
gray:           var(--dca-gray, var(--body-quiet-color, #666))
gray-lightest:  var(--dca-gray-lightest, var(--darkened-bg, #f2f2f2))
gray-lighter    var(--dca-gray-lighter, var(--border-color, #ddd))
gray-light:     var(--dca-gray-lightest, var(--darkened-bg, #f2f2f2))
gray-primary:   var(--dca-primary, var(--primary, #0bf))
black:          var(--dca-black, var(--body-fg), #000))
```

How the menu system works

Basic concepts

Soft Roots

A *soft root* is a page that acts as the root for a menu navigation tree.

Typically, this will be a page that is the root of a significant new section on your site.

When the *soft root* feature is enabled, the navigation menu for any page will start at the nearest *soft root*, rather than at the real root of the site's page hierarchy.

This feature is useful when your site has deep page hierarchies (and therefore multiple levels in its navigation trees). In such a case, you usually don't want to present site visitors with deep menus of nested items.

For example, you're on the page "Introduction to Bleeding", so the menu might look like this:

```
School of Medicine
    Medical Education
```

(continues on next page)

(continued from previous page)

```
    Departments
        Department of Lorem Ipsum
        Department of Donec Imperdiet
        Department of Cras Eros
        Department of Mediaeval Surgery
            Theory
            Cures
                Bleeding
                    * Introduction to Bleeding <current page>
                    Bleeding - the scientific evidence
                    Cleaning up the mess
                Cupping
                Leaches
                Maggots
            Techniques
            Instruments
        Department of Curabitur a Purus
        Department of Sed Accumsan
        Department of Etiam
    Research
    Administration
    Contact us
    Impressum
```

which is frankly overwhelming.

By making "Department of Mediaeval Surgery" a *soft root*, the menu becomes much more manageable:

```
Department of Mediaeval Surgery
    Theory
    Cures
        Bleeding
            * Introduction to Bleeding <current page>
            Bleeding - the scientific evidence
            Cleaning up the mess
        Cupping
        Leaches
        Maggots
    Techniques
    Instruments
```

Registration

The menu system isn't monolithic. Rather, it is composed of numerous active parts, many of which can operate independently of each other.

What they operate on is a list of menu nodes, that gets passed around the menu system, until it emerges at the other end.

The main active parts of the menu system are menu *generators* and *modifiers*.

Some of these parts are supplied with the `"menus"` application. Some come from other applications (from the `"cms"` application in django CMS, for example, or some other application entirely).

All these active parts need to be registered within the menu system.

Then, when the time comes to build a menu, the system will ask all the registered menu generators and modifiers to get to work on it.

Generators and Modifiers

Menu generators and modifiers are classes.

Generators

To add nodes to a menu a generator is required.

There is one in cms for example, which examines the Pages in the database and adds them as nodes.

These classes are sub-classes of *menus.base.Menu*. The one in cms is `cms.menu.CMSMenu`.

In order to use a generator, its *get_nodes()* method must be called.

Modifiers

A modifier examines the nodes that have been assembled, and modifies them according to its requirements (adding or removing them, or manipulating their attributes, as it sees fit).

An important one in cms (`cms.menu.SoftRootCutter`) removes the nodes that are no longer required when a soft root is encountered.

These classes are sub-classes of *menus.base.Modifier*. Examples are `cms.menu.NavExtender` and `cms.menu.SoftRootCutter`.

In order to use a modifier, its *modify()* method must be called.

Note that each Modifier's *modify()* method can be called *twice*, before and after the menu has been trimmed.

For example when using the `{% show_menu %}` template tag, it's called:

- first, by *menus.menu_pool.MenuPool.get_nodes()*, with the argument `post_cut = False`
- later, by the template tag, with the argument `post_cut = True`

This corresponds to the state of the nodes list before and after *menus.templatetags.menu_tags.cut_levels()*, which removes nodes from the menu according to the arguments provided by the template tag.

This is because some modification might be required on *all* nodes, and some might only be required on the subset of nodes left after cutting.

Nodes

Nodes are assembled in a tree. Each node is an instance of the *menus.base.NavigationNode* class.

A NavigationNode has attributes such as URL, title, parent and children - as one would expect in a navigation tree.

It also has an `attr` attribute, a dictionary that's provided for you to add arbitrary attributes to, rather than placing them directly on the node itself, where they might clash with something.

> **Warning:** You can't assume that a *menus.base.NavigationNode* represents a django CMS Page. Firstly, some nodes may represent objects from other applications. Secondly, you can't expect to be able to access Page objects via NavigationNodes. To check if node represents a CMS Page, check for `is_page` in *menus.base.NavigationNode.attr* and that it is `True`.

Menu system logic

Let's look at an example using the `{% show_menu %}` template tag. It will be different for other template tags, and your applications might have their own menu classes. But this should help explain what's going on and what the menu system is doing.

One thing to understand is that the system passes around a list of `nodes`, doing various things to it.

Many of the methods below pass this list of nodes to the ones it calls, and return them to the ones that they were in turn called by.

The `ShowMenu.get_context()` method

When the Django template engine encounters the `{% show_menu %}` template tag, it calls the *get_context()* of the `ShowMenu` class. `get_context()`:

- calls *menus.menu_pool.MenuPool.get_nodes()* (see *The MenuPool.get_nodes() method* below)
- cuts any nodes other than its descendants (if a `root_id` has been provided)
- calls *menus.templatetags.menu_tags.cut_levels()* to remove unwanted levels
- calls *menus.menu_pool.MenuPool.apply_modifiers()* with `post_cut = True`
- return the nodes to the context in the variable `children`

The `MenuPool.get_nodes()` method

menus.menu_pool.MenuPool.get_nodes() calls three other methods of `MenuPool` in turn:

- *menus.menu_pool.MenuPool.discover_menus()*

  Checks every application's `cms_menus.py`, and registers:

  - Menu classes, placing them in the `self.menus` dict
  - Modifier classes, placing them in the self.modifiers list
- *menus.menu_pool.MenuPool._build_nodes()*
  - checks the cache to see if it should return cached nodes
  - loops over the Menus in self.menus (note: by default the only generator is `cms.menu.CMSMenu`); for each:
    * calls its *menus.base.Menu.get_nodes()* - the menu generator
    * *menus.menu_pool._build_nodes_inner_for_one_menu()*
    * adds all nodes into a big list
- *menus.menu_pool.MenuPool.apply_modifiers()*
  - *menus.menu_pool.MenuPool._mark_selected()*
  - loops over each node, comparing its URL with the request.path_info, and marks the best match as `selected`

  - loops over the Modifiers (see *Menu Modifiers* below) in `self.modifiers` calling each one's *`modify()`* with `post_cut=False`.

Menu Modifiers

Each `Modifier` manipulates menu nodes and their attributes.

The default Modifiers, in the order they are called, are:

- *`cms.cms_menus.NavExtender`*
- *`cms.cms_menus.SoftRootCutter`*

  If `post_cut` is `True`, removes all nodes below the appropriate soft root; otherwise, returns immediately.
- *`menus.modifiers.Marker`*

  If `post_cut` or `breadcrumb` is `True`, returns immediately; otherwise, loops over all nodes; finds selected, marks its ancestors, siblings and children
- *`menus.modifiers.AuthVisibility`*

  Removes nodes that require authorization to see
- *`menus.modifiers.Level`*

  Loops over all nodes; for each one that is a root node (`level == 0`) passes it to:

  - `mark_levels()` recurses over a node's descendants marking their levels

Some commonly-used plugins

Please note that dozens if not hundreds of different django CMS plugins have been made available under open-source licences. Some, like the ones on this page, are likely to be of general interest, while others are highly specialised.

This page only lists those that fall under the responsibility of the django CMS project. Please see the Django Packages site for some more, or just do a web search for the functionality you seek - you'll be surprised at the range of plugins that has been created.

django CMS Core Addons

We maintain a set of *Core Addons* for django CMS.

You don't need to use them, and for many of them alternatives exist, but they represent a good way to get started with a reliable project set-up. We recommend them for new users of django CMS in particular.

At this point in time not all are compatible with versions 4 of django CMS or above. Please see those two lists:

Recommended with Version 4 of django CMS

Package	Description	Status
djangocms-text-ckeditor	Text Plugin for django CMS using CKEditor 4	supports v4.1 as of v5.1.2
djangocms-versioning	Adds versioning and publication management features to v4	v4.x only
djangocms-moderation	Implements moderation process to channel publications	v4.x only
djangocms-alias	Central management of recurring plugin sequences - replaces static placeholders	v4.x only
djangocms-url-manager	Central place to manage all link urls for your project	v4.x only
djangocms-frontend	Plugin bundle for django CMS providing several components from the popular Bootstrap 5 framework. Themable and extensible	supports v4.1
django-filer	Manager for assets like images	supports v4.1
djangocms-attributes-field	An opinionated implementation to add attributes to any HTML element	no issues known
djangocms-icons	Adds support for Fontawesome icons attributes to any HTML element	supports v4.1
djangocms-picture	Add images to your site	no issues known
djangocms-admin-style	django CMS design for Django's admin backend	supports v4.1 as of v3.2.1

We welcome feedback, documentation, patches and any other help to maintain and improve these valuable components.

Thrid-party opinionated packages

Package	Description	Status
djangocms-version-locking	Allows locking draft versions to avoid conflicts	v4.x only
djangocms-page-admin	New PageContent admin which doesn't include tree functionality	supports v4.0, v4.1 support unclear
djangocms-navigation	(undocumented)	supports v4.0, v4.1 support unclear
djangocms-references	Retrieve objects that are related to a selected object and view to present that data to the end user	supports v4.0, v4.1 support unclear

Packages not (yet) supporting version 4

Package	Description	Status
djangocms-link	Add links on your site	not yet supported
djangocms-blog	django CMS blog application - Support for multilingual posts, placeholders, social network meta tags and configurable apphooks	not yet supported
djangocms-history	Undo/redo functionality for django CMS operations	not yet supported
djangocms-page-sitemap	django CMS page extension to handle sitemap customization	not yet supported
djangocms-page-meta	Add SEO meta data to django CMS pages	not yet supported
djangocms-transfer	Export and import plugins as JSON	not yet supported

Contributors are needed to add django CMS v4 support to the following packages:

Deprecated addons

Some older plugins that you may have encountered are now deprecated and we advise against incorporating them into new projects.

These are:

- cmsplugin-filer
- Aldryn Style
- Aldryn Locations
- Aldryn Snippet
- Django CMS Bootstrap4 (djangocms-frontend offers an automated migration)

Frontend integration

Generally speaking, django CMS is wholly frontend-agnostic. It doesn't care what your site's frontend is built on or uses.

The exception to this is when editing your site, as the django CMS toolbar and editing controls use their own frontend code, and this can sometimes affect or be affected by your site's code.

The content reloading introduced in django CMS 3.5 for plugin operations (when moving/adding/deleting etc) pull markup changes from the server. This may require a JS widget to be reinitialised, or additional CSS to be loaded, depending on your own frontend set-up.

For example, if using Less.js, you may notice that content loads without expected CSS after plugin saves.

In such a case, you can use the `cms-content-refresh` event to take care of that, by adding something like:

```
{% if request.toolbar and request.toolbar.edit_mode_active %}
    <script>
    CMS.$(window).on('cms-content-refresh', function () {
         less.refresh();
```

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```
    });
    </script>
{% endif %}
```

after the toolbar JavaScript.

5.2.3 How-to guides

These guides presuppose some familiarity with django CMS. They cover some of the same territory as the *Tutorials*, but in more detail.

Using core functionality

How to use placeholders outside the CMS

Placeholder fields are special model fields that django CMS uses to render user-editable content (plugins) in templates. That is, it's the place where a user can add text, video or any other plugin to a webpage, using the same frontend editing as the CMS pages.

Changed in version 4.0: Since django CMS 4.0 the toolbar offers preview and edit endpoints for Django models which contain Placeholders.

- This allows for models (such as django CMS Alias) which do not have a user-facing view to still contain placeholders.
- However, it requires the registration of frontend-editable models with django CMS.
- Also, views need to tell the toolbar if they contain a frontend-editable model.

Placeholders can be viewed as containers for `CMSPlugin` instances, and can be used outside the CMS in custom applications using the `PlaceholderRelationField`.

By defining a `PlaceholderRelationField` on a custom model you can take advantage of the full power of `CMSPlugin` in one or more placeholders.

> **Warning:** Django CMS 3.x used a different way of integrating placeholders. It's `PlaceholderField("slot_name")` needs to be changed into a `PlaceholderRelationField` (available since django CMS 4.x).

Get started

You need to define a `PlaceholderRelationField` on the model you would like to use:

```
from django.db import models
from cms.models.fields import PlaceholderRelationField
from cms.utils.placeholder import get_placeholder_from_slot

class MyModel(models.Model):
    # your fields
    placeholders = PlaceholderRelationField()
```

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```
    @cached_property
    def my_placeholder(self):
        return get_placeholder_from_slot(self.placeholders, "slot_name")

    # your methods
```

The *PlaceholderRelationField* can reference more than one field. It is customary to add (cached) properties to the model referring to specific placeholders. The utility function *get_placeholder_from_slot()* retrieves a placeholder object based on its slot name.

The `slot` is used in templates, to determine where the placeholder's plugins should appear in the page, and in the placeholder configuration *CMS_PLACEHOLDER_CONF*, which determines which plugins may be inserted into this placeholder.

Note: If you add a PlaceholderRelationField to an existing model, you'll be able to see the placeholder in the frontend editor only after saving the relevant instance.

Admin Integration

Changed in version 4.0.

Since django CMS version 4 *PlaceholderAdminMixin* is not required any more. For now, it still exists as an empty mixin but will be removed in a future version.

I18N Placeholders

Placeholders and plugins within them support multiple languages out of the box.

If you need other fields translated as well, django CMS has support for django-hvad. If you use a `TranslatableModel` model be sure to **not** include the placeholder fields amongst the translated fields:

```
class MultilingualExample1(TranslatableModel):
    translations = TranslatedFields(
        title=models.CharField('title', max_length=255),
        description=models.CharField('description', max_length=255),
    )
    placeholders = PlaceholderRelationField()

    @cached_property
    def my_placeholder(self):
        return get_placeholder_from_slot(self.placeholders, "slot_name")

    def __str__(self):
        return self.title
```

Templates

To render the placeholder in a template you use the *render_placeholder* tag from the *cms_tags* template tag library:

```
{% load cms_tags %}

{% render_placeholder mymodel_instance.my_placeholder "640" %}
```

The *render_placeholder* tag takes the following parameters:

- *PlaceholderField* instance
- `width` parameter for context sensitive plugins (optional)
- `language` keyword plus `language-code` string to render content in the specified language (optional)

The view in which you render your placeholder field must return the `request` object in the context. The frontend editing and preview endpoints require a view to render an object. This method takes the request and the object as parameter (see example below: `render_my_model`).

If the object has a user-facing view it typically is identical to the preview and editing endpoints, but has to get the object from the URL (e.g., by its primary key). **It also needs to set the toolbar object, so that the toolbar will have Edit and Preview buttons:**

```
from django.shortcuts import get_object_or_404, render


def render_my_model(request, obj):
    return render(
        request,
        "my_model_detail.html",
        {
            "object": obj,
        },
    )


def my_model_detail(request, id):
    obj = get_object_or_404(MyModel, id=id)  # Get the object (here by id)
    request.toolbar.set_object(obj)  # Announce the object to the toolbar
    return render_my_model(request, obj)  # Same as preview rendering
```

Note: If you want to render plugins from a specific language, you can use the tag like this:

```
{% load cms_tags %}

{% render_placeholder mymodel_instance.my_placeholder language 'en' %}
```

Adding the slots to the model

To let django CMS' frontend editor know which placeholders the model contains, declare them in a second template, only needed for rendering the structure mode, called, say, `templtes/my_app/my_model_structure.html`:

```
{% load cms_tags %}
{% placeholder "slot_name" %}
```

The important bit is to include all slot names for the model in the structure template. Other parts of the templte are not necessary.

Add the structure mode template to the model

Let the model know about this template by declaring the `get_template()` method:

```
class MyModel(models.Model):
    ...

    def get_template(self):
        return "my_app/my_model_structure.html"

    ...
```

Registering the model for frontend editing

New in version 4.0.

The final step is to register the model for frontend editing. Since django CMS 4 this is done by adding a *CMSAppConfig* class to the app's *cms_config.py* file:

```
from cms.app_base import CMSAppConfig
from . import models, views


class MyAppConfig(CMSAppConfig):
    cms_enabled = True
    cms_toolbar_enabled_models = [(models.MyModel, views.render_my_model)]
```

Adding content to a placeholder

Placeholders can be edited from the frontend by visiting the page displaying your model (where you put the *render_placeholder* tag), then appending `?toolbar_on` to the page's URL.

This will make the frontend editor top banner appear (and if necessary will require you to login).

Once in frontend editing mode, the interface for your application's `PlaceholderFields` will work in much the same way as it does for CMS Pages, with a switch for Structure and Content modes and so on.

Permissions

To be able to edit a placeholder user must be a `staff` member and needs either edit permissions on the model that contains the *`PlaceholderRelationField`*, or permissions for that specific instance of that model. Required permissions for edit actions are:

- to `add`: require `add` **or** `change` permission on related Model or instance.
- to `change`: require `add` **or** `change` permission on related Model or instance.
- to `delete`: require `add` **or** `change` **or** `delete` permission on related Model or instance.

With this logic, an user who can `change` a Model's instance but can not `add` a new Model's instance will be able to add some placeholders or plugins to existing Model's instances.

Model permissions are usually added through the default Django `auth` application and its admin interface. Object-level permission can be handled by writing a custom authentication backend as described in django docs

For example, if there is a `UserProfile` model that contains a `PlaceholderRelationField` then the custom backend can refer to a `has_perm` method (on the model) that grants all rights to current user only based on the user's `UserProfile` object:

```
def has_perm(self, user_obj, perm, obj=None):
    if not user_obj.is_staff:
        return False
    if isinstance(obj, UserProfile):
        if user_obj.get_profile()==obj:
            return True
    return False
```

How to serve multiple languages

If you used django CMS quickstart to start your project, you'll find that it's already set up for serving multilingual content. Our installation guide also does the same.

This guide specifically describes the steps required to enable multilingual support, in case you need to it manually.

Multilingual URLs

If you use more than one language, django CMS urls, *including the admin URLS*, need to be referenced via `i18n_patterns()`. For more information about this see the official Django documentation on the subject.

Here's a full example of `urls.py`:

```
from django.conf.urls.i18n import i18n_patterns
from django.contrib import admin
from django.contrib.staticfiles.urls import staticfiles_urlpatterns
from django.urls import include, path
from django.views.i18n import JavaScriptCatalog


admin.autodiscover()

urlpatterns = i18n_patterns(
    re_path('jsi18n/', JavaScriptCatalog.as_view(), name='javascript-catalog'),
```

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```
)
urlpatterns += staticfiles_urlpatterns()

# note the django CMS URLs included via i18n_patterns
urlpatterns += i18n_patterns(
    path('admin/', include(admin.site.urls)),
    path('', include('cms.urls')),
)
```

Monolingual URLs

Of course, if you want only monolingual URLs, without a language code, simply don't use `i18n_patterns()`:

```
urlpatterns += [
    path('admin', admin.site.urls),
    path('', include('cms.urls')),
]
```

Store the user's language preference

The user's preferred language is maintained through a browsing session. So that django CMS remembers the user's preference in subsequent sessions, it must be stored in a cookie. To enable this, `cms.middleware.language.LanguageCookieMiddleware` must be added to the project's `MIDDLEWARE` setting.

See *How django CMS determines which language to serve* for more information about how this works.

Working in templates

Display a language chooser in the page

The *`language_chooser`* template tag will display a language chooser for the current page. You can modify the template in `menu/language_chooser.html` or provide your own template if necessary.

Example:

```
{% load menu_tags %}
{% language_chooser "myapp/language_chooser.html" %}
```

If you are in an apphook and have a detail view of an object you can set an object to the toolbar in your view. The cms will call `get_absolute_url` in the corresponding language for the language chooser:

Example:

```
class AnswerView(DetailView):
    def get(self, *args, **kwargs):
        self.object = self.get_object()
        if hasattr(self.request, 'toolbar'):
            self.request.toolbar.set_object(self.object)
        response = super().get(*args, **kwargs)
        return response
```

With this you can more easily control what url will be returned on the language chooser.

Note: If you have a multilingual objects be sure that you return the right url if you don't have a translation for this language in `get_absolute_url`

Get the URL of the current page for a different language

The `page_language_url` returns the URL of the current page in another language.

Example:

```
{% page_language_url "de" %}
```

Configuring language-handling behaviour

CMS_LANGUAGES describes the all options available for determining how django CMS serves content across multiple languages.

Multi-Site Installation

For operating multiple websites using the same virtualenv you can use copies of `manage.py`, `wsgi.py` and different versions of settings and the URL configuration for each site. You can use the same database for different websites or, if you want a stricter separation, different databases. You can define settings for all sites in a file that is imported in the site-specific settings, e. g. `my_project/base_settings.py`. At the end of these site-specific settings you can import local settings, which are not under version control, with SECRET_KEY, DATABASES, ALLOWED_HOSTS etc., which may be site-specific or not.

1. Copy and edit `wsgi.py` and `manage.py` e. g. to `wsgi_second_site.py` and `manage_second_site.py`: Change the reference to the settings like `os.environ.setdefault("DJANGO_SETTINGS_MODULE", "my_project.settings_second_site")`, if the settings are in `my_project/settings_second_site.py`. Do this for each site.
2. In the site-specific settings import common base settings in the first line like `from .base_settings import *` and define `SITE_ID`, `ROOT_URLCONF`, `CMS_LANGUAGES` and other settings that should be different on the sites. This way all the items from the imported base settings can be overridden by later definitions:

   `settings.second_site.py`:

   ```
   from .base_settings import *

   SITE_ID: int = 2
   ROOT_URLCONF: str = 'my_project.urls_second_site'
   # other site-specific settings...

   from .settings_local import *
   ```

3. In the web server settings for a site you refer to the site-specific `wsgi*.py` like `wsgi_second_site.py`.

How to work with templates

Application can reuse cms templates by mixing cms template tags and normal django templating language.

static_alias

New in version 4.0.

Note: Using `static_alias` requires the installation of djangocms-alias to work.

Plain *placeholder* cannot be used in templates used by external applications, use `static_alias` instead.

CMS_TEMPLATE

`CMS_TEMPLATE` is a context variable available in the context; it contains the template path for CMS pages and application using apphooks, and the default template (i.e.: the first template in *CMS_TEMPLATES*) for non-CMS managed URLs.

This is mostly useful to use it in the `extends` template tag in the application templates to get the current page template.

Example: cms template

```
{% load cms_tags %}
<html>
    <body>
    {% cms_toolbar %}
    {% block main %}
    {% placeholder "main" %}
    {% endblock main %}
    </body>
</html>
```

Example: application template

```
{% extends CMS_TEMPLATE %}
{% load cms_tags %}
{% block main %}
{% for item in object_list %}
    {{ item }}
{% endfor %}
{% static_placeholder "sidebar" %}
{% endblock main %}
```

`CMS_TEMPLATE` memorises the path of the cms template so the application template can dynamically import it.

render_model

render_model allows to edit the django models from the frontend by reusing the django CMS frontend editor.

How to manage caching

Set-up

To setup caching configure a caching backend in django.

Details for caching can be found here: https://docs.djangoproject.com/en/dev/topics/cache/

In your middleware settings be sure to add `django.middleware.cache.UpdateCacheMiddleware` at the first and `django.middleware.cache.FetchFromCacheMiddleware` at the last position:

```
MIDDLEWARE=[
        'django.middleware.cache.UpdateCacheMiddleware',
        ...
        'cms.middleware.language.LanguageCookieMiddleware',
        'cms.middleware.user.CurrentUserMiddleware',
        'cms.middleware.page.CurrentPageMiddleware',
        'cms.middleware.toolbar.ToolbarMiddleware',
        'django.middleware.cache.FetchFromCacheMiddleware',
    ],
```

Plugins

Normally all plugins will be cached. If you have a plugin that is dynamic based on the current user or other dynamic properties of the request set the `cache=False` attribute on the plugin class:

```
class MyPlugin(CMSPluginBase):
    name = _("MyPlugin")
    cache = False
```

Warning: If you disable a plugin cache be sure to restart the server and clear the cache afterwards.

Content Cache Duration

Default: 60

This can be changed in *CMS_CACHE_DURATIONS*

Settings

Caching is set default to true. Have a look at the following settings to enable/disable various caching behaviours:

- *CMS_PAGE_CACHE*
- *CMS_PLACEHOLDER_CACHE*
- *CMS_PLUGIN_CACHE*

How to enable frontend editing for Page and Django models

As well as `PlaceholderFields`, 'ordinary' Django model fields (both on CMS Pages and your own Django models) can also be edited through django CMS's frontend editing interface. This is very convenient for the user because it saves having to switch between frontend and admin views.

Using this interface, model instance values that can be edited show the "Double-click to edit" hint on hover. Double-clicking opens a pop-up window containing the change form for that model.

> **Warning:** This feature is only partially compatible with django-hvad: using `render_model` with hvad-translated fields (say `{% render_model object 'translated_field' %}` returns an error if the hvad-enabled object does not exists in the current language. As a workaround `render_model_icon` can be used instead.

Template tags

This feature relies on five template tags sharing common code. All require that you `{% load cms_tags %}` in your template:

- *render_model* (for editing a specific field)
- *render_model_block* (for editing any of the fields in a defined block)
- *render_model_icon* (for editing a field represented by another value, such as an image)
- *render_model_add* (for adding an instance of the specified model)
- *render_model_add_block* (for adding an instance of the specified model)

Look at the tag-specific page for more detailed reference and discussion of limitations and caveats.

Page titles edit

For CMS pages you can edit the titles from the frontend; according to the attribute specified a default field, which can also be overridden, will be editable.

Main title:

```
{% render_model request.current_page "title" %}
```

Page title:

```
{% render_model request.current_page "page_title" %}
```

Menu title:

```
{% render_model request.current_page "menu_title" %}
```

All three titles:

```
{% render_model request.current_page "titles" %}
```

You can always customise the editable fields by providing the *edit_field* parameter:

```
{% render_model request.current_page "title" "page_title,menu_title" %}
```

Page menu edit

By using the special keyword `changelist` as edit field the frontend editing will show the page tree; a common pattern for this is to enable changes in the menu by wrapping the menu template tags:

```
{% render_model_block request.current_page "changelist" %}
    <h3>Menu</h3>
    <ul>
        {% show_menu 1 100 0 1 "sidebar_submenu_root.html" %}
    </ul>
{% endrender_model_block %}
```

Will render to:

```
<template class="cms-plugin cms-plugin-start cms-plugin-cms-page-changelist-1"></
↪template>
    <h3>Menu</h3>
    <ul>
        <li><a href="/">Home</a></li>
        <li><a href="/another">another</a></li>
        [...]
<template class="cms-plugin cms-plugin-end cms-plugin-cms-page-changelist-1"></template>
```

Editing 'ordinary' Django models

As noted above, your own Django models can also present their fields for editing in the frontend. This is achieved by using the `FrontendEditableAdminMixin` base class.

Note that this is only required for fields **other than** `PlaceholderFields`. `PlaceholderFields` are automatically made available for frontend editing.

Configure the model's admin class

Configure your admin class by adding the `FrontendEditableAdminMixin` mixin to it (see `Django admin documentation` for general Django admin information):

```
from cms.admin.placeholderadmin import FrontendEditableAdminMixin
from django.contrib import admin
```

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(continued from previous page)

```
class MyModelAdmin(FrontendEditableAdminMixin, admin.ModelAdmin):
    ...
```

The ordering is important: as usual, **mixins must come first**.

Then set up the templates where you want to expose the model for editing, adding a `render_model` template tag:

```
{% load cms_tags %}

{% block content %}
<h1>{% render_model instance "some_attribute" %}</h1>
{% endblock content %}
```

See *template tag reference* for arguments documentation.

Selected fields edit

Frontend editing is also possible for a set of fields.

Set up the admin

You need to add to your model admin a tuple of fields editable from the frontend admin:

```
from cms.admin.placeholderadmin import FrontendEditableAdminMixin
from django.contrib import admin


class MyModelAdmin(FrontendEditableAdminMixin, admin.ModelAdmin):
    frontend_editable_fields = ("foo", "bar")
    ...
```

Set up the template

Then add comma separated list of fields (or just the name of one field) to the template tag:

```
{% load cms_tags %}

{% block content %}
<h1>{% render_model instance "some_attribute" "some_field,other_field" %}</h1>
{% endblock content %}
```

Special attributes

The `attribute` argument of the template tag is not required to be a model field, property or method can also be used as target; in case of a method, it will be called with request as argument.

Custom views

You can link any field to a custom view (not necessarily an admin view) to handle model-specific editing workflow.

The custom view can be passed either as a named url (`view_url` parameter) or as name of a method (or property) on the instance being edited (`view_method` parameter). In case you provide `view_method` it will be called whenever the template tag is evaluated with `request` as parameter.

The custom view does not need to obey any specific interface; it will get `edit_fields` value as a `GET` parameter.

See *template tag reference* for arguments documentation.

Example `view_url`:

```
{% load cms_tags %}

{% block content %}
<h1>{% render_model instance "some_attribute" "some_field,other_field" ""
↪"admin:exampleapp_example1_some_view" %}</h1>
{% endblock content %}
```

Example `view_method`:

```
class MyModel(models.Model):
    char = models.CharField(max_length=10)

    def some_method(self, request):
        return "/some/url"


{% load cms_tags %}

{% block content %}
<h1>{% render_model instance "some_attribute" "some_field,other_field" "" "" "some_method
↪" %}</h1>
{% endblock content %}
```

Model changelist

By using the special keyword `changelist` as edit field the frontend editing will show the model changelist:

```
{% render_model instance "name" "changelist" %}
```

Will render to:

```
<div class="cms-plugin cms-plugin-myapp-mymodel-changelist-1">
    My Model Instance Name
</div>
```

Filters

If you need to apply filters to the output value of the template tag, add quoted sequence of filters as in Django `filter` template tag:

```
{% load cms_tags %}

{% block content %}
<h1>{% render_model instance "attribute" "" "" "truncatechars:9" %}</h1>
{% endblock content %}
```

Context variable

The template tag output can be saved in a context variable for later use, using the standard `as` syntax:

```
{% load cms_tags %}

{% block content %}
{% render_model instance "attribute" as variable %}

<h1>{{ variable }}</h1>

{% endblock content %}
```

How to create sitemaps

Sitemap

Sitemaps are XML files used by Google to index your website by using their **Webmaster Tools** and telling them the location of your sitemap.

The *`cms.sitemaps.CMSSitemap`* will create a sitemap with all the published pages of your CMS.

Configuration

- add `django.contrib.sitemaps` to your project's `INSTALLED_APPS` setting
- add `from cms.sitemaps import CMSSitemap` to the top of your main `urls.py`
- add `from django.contrib.sitemaps.views import sitemap` to `urls.py`
- add `url(r'^sitemap\.xml$', sitemap, {'sitemaps': {'cmspages': CMSSitemap}}),` to your `urlpatterns`

`django.contrib.sitemaps`

More information about `django.contrib.sitemaps` can be found in the official Django documentation.

New in version 3.0.

How to manage Page Types

Changed in version 4.0.

Currently, page types as know from django CMS 3.x are not available.

Creating new functionality

How to create Plugins

The simplest plugin

We'll start with an example of a very simple plugin.

You may use `python -m manage startapp` to set up the basic layout for your plugin app (remember to add your plugin to `INSTALLED_APPS`). Alternatively, just add a file called `cms_plugins.py` to an existing Django application.

Place your plugins in `cms_plugins.py`. For our example, include the following code:

```
from cms.plugin_base import CMSPluginBase
from cms.plugin_pool import plugin_pool
from cms.models.pluginmodel import CMSPlugin
from django.utils.translation import gettext_lazy as _

@plugin_pool.register_plugin
class HelloPlugin(CMSPluginBase):
    model = CMSPlugin
    render_template = "hello_plugin.html"
    cache = False
```

Now we're almost done. All that's left is to add the template. Add the following into the root template directory in a file called `hello_plugin.html`:

```
<h1>Hello {% if request.user.is_authenticated %}{{ request.user.first_name }} {{ request.
↪user.last_name}}{% else %}Guest{% endif %}</h1>
```

This plugin will now greet the users on your website either by their name if they're logged in, or as Guest if they're not.

Now let's take a closer look at what we did there. The `cms_plugins.py` files are where you should define your subclasses of *`cms.plugin_base.CMSPluginBase`*, these classes define the different plugins.

There are two required attributes on those classes:

- `model`: The model you wish to use for storing information about this plugin. If you do not require any special information, for example configuration, to be stored for your plugins, you can simply use *`cms.models.pluginmodel.CMSPlugin`* (we'll look at that model more closely in a bit). In a normal admin class, you don't need to supply this information because `admin.site.register(Model, Admin)` takes care of it, but a plugin is not registered in that way.

- `name`: The name of your plugin as displayed in the admin. It is generally good practice to mark this string as translatable using `django.utils.translation.gettext_lazy()`, however this is optional. By default the name is a nicer version of the class name.

And one of the following **must** be defined if `render_plugin` attribute is `True` (the default):

- `render_template`: The template to render this plugin with.

or

- `get_render_template`: A method that returns a template path to render the plugin with.

In addition to those attributes, you can also override the *`render()`* method which determines the template context variables that are used to render your plugin. By default, this method only adds `instance` and `placeholder` objects to your context, but plugins can override this to include any context that is required.

A number of other methods are available for overriding on your CMSPluginBase sub-classes. See: *`CMSPluginBase`* for further details.

Troubleshooting

Since plugin modules are found and loaded by django's importlib, you might experience errors because the path environment is different at runtime. If your *cms_plugins* isn't loaded or accessible, try the following:

```
$ python -m manage shell
>>> from importlib import import_module
>>> m = import_module("myapp.cms_plugins")
>>> m.some_test_function()  # from the myapp.cms_plugins module
```

Storing configuration

In many cases, you want to store configuration for your plugin instances. For example, if you have a plugin that shows the latest blog posts, you might want to be able to choose the amount of entries shown. Another example would be a gallery plugin where you want to choose the pictures to show for the plugin.

To do so, you create a Django model by sub-classing *`cms.models.pluginmodel.CMSPlugin`* in the `models.py` of an installed application.

Let's improve our `HelloPlugin` from above by making its fallback name for non-authenticated users configurable.

In our `models.py` we add the following:

```
from cms.models.pluginmodel import CMSPlugin

from django.db import models

class Hello(CMSPlugin):
    guest_name = models.CharField(max_length=50, default='Guest')
```

If you followed the Django tutorial, this shouldn't look too new to you. The only difference to normal models is that you sub-class *`cms.models.pluginmodel.CMSPlugin`* rather than `django.db.models.Model`.

Now we need to change our plugin definition to use this model, so our new `cms_plugins.py` looks like this:

```
from cms.plugin_base import CMSPluginBase
from cms.plugin_pool import plugin_pool
from django.utils.translation import gettext_lazy as _

from .models import Hello

@plugin_pool.register_plugin
class HelloPlugin(CMSPluginBase):
    model = Hello
    name = _("Hello Plugin")
    render_template = "hello_plugin.html"
    cache = False

    def render(self, context, instance, placeholder):
        context = super().render(context, instance, placeholder)
        return context
```

We changed the `model` attribute to point to our newly created `Hello` model and pass the model instance to the context.

As a last step, we have to update our template to make use of this new configuration:

```
<h1>Hello {% if request.user.is_authenticated %}
  {{ request.user.first_name }} {{ request.user.last_name}}
{% else %}
  {{ instance.guest_name }}
{% endif %}</h1>
```

The only thing we changed there is that we use the template variable `{{ instance.guest_name }}` instead of the hard-coded `Guest` string in the else clause.

> **Warning:** You cannot name your model fields the same as any installed plugins lower- cased model name, due to the implicit one-to-one relation Django uses for sub-classed models. If you use all core plugins, this includes: `file`, `googlemap`, `link`, `picture`, `snippetptr`, `teaser`, `twittersearch`, `twitterrecententries` and `video`.
>
> Additionally, it is *recommended* that you avoid using `page` as a model field, as it is declared as a property of *`cms.models.pluginmodel.CMSPlugin`*. While the use of `CMSPlugin.page` is deprecated the property still exists as a compatibility shim.

Handling Relations

Some user interactions make it necessary to create a copy of the plugin, most notably if a user copies and pastes contents of a placeholder. So if your custom plugin has foreign key (to it, or from it) or many-to-many relations you are responsible for copying those related objects, if required, whenever the CMS copies the plugin - **it won't do it for you automatically**.

Every plugin model inherits the empty *`cms.models.pluginmodel.CMSPlugin.copy_relations()`* method from the base class, and it's called when your plugin is copied. So, it's there for you to adapt to your purposes as required.

Typically, you will want it to copy related objects. To do this you should create a method called `copy_relations` on your plugin model, that receives the **old instance** of the plugin as an argument.

You may however decide that the related objects shouldn't be copied - you may want to leave them alone, for example. Or, you might even want to choose some altogether different relations for it, or to create new ones when it's copied… it depends on your plugin and the way you want it to work.

If you do want to copy related objects, you'll need to do this in two slightly different ways, depending on whether your plugin has relations *to* or *from* other objects that need to be copied too:

For foreign key relations *from* other objects

Your plugin may have items with foreign keys to it, which will typically be the case if you set it up so that they are inlines in its admin. So you might have two models, one for the plugin and one for those items:

```
class ArticlePluginModel(CMSPlugin):
    title = models.CharField(max_length=50)

class AssociatedItem(models.Model):
    plugin = models.ForeignKey(
        ArticlePluginModel,
        related_name="associated_item"
    )
```

You'll then need the `copy_relations()` method on your plugin model to loop over the associated items and copy them, giving the copies foreign keys to the new plugin:

```
class ArticlePluginModel(CMSPlugin):
    title = models.CharField(max_length=50)

    def copy_relations(self, oldinstance):
        # Before copying related objects from the old instance, the ones
        # on the current one need to be deleted. Otherwise, duplicates may
        # appear on the public version of the page
        self.associated_item.all().delete()

        for associated_item in oldinstance.associated_item.all():
            # instance.pk = None; instance.pk.save() is the slightly odd but
            # standard Django way of copying a saved model instance
            associated_item.pk = None
            associated_item.plugin = self
            associated_item.save()
```

For many-to-many or foreign key relations *to* other objects

Let's assume these are the relevant bits of your plugin:

```
class ArticlePluginModel(CMSPlugin):
    title = models.CharField(max_length=50)
    sections = models.ManyToManyField(Section)
```

Now when the plugin gets copied, you want to make sure the sections stay, so it becomes:

```
class ArticlePluginModel(CMSPlugin):
    title = models.CharField(max_length=50)
    sections = models.ManyToManyField(Section)

    def copy_relations(self, oldinstance):
        self.sections.set(oldinstance.sections.all())
```

If your plugins have relational fields of both kinds, you may of course need to use *both* the copying techniques described above.

Relations *between* plugins

It is much harder to manage the copying of relations when they are from one plugin to another.

See the GitHub issue copy_relations() does not work for relations between cmsplugins #4143 for more details.

Advanced

Inline Admin

If you want to have the foreign key relation as a inline admin, you can create an `admin.StackedInline` class and put it in the Plugin to "inlines". Then you can use the inline admin form for your foreign key references:

```
class ItemInlineAdmin(admin.StackedInline):
    model = AssociatedItem


class ArticlePlugin(CMSPluginBase):
    model = ArticlePluginModel
    name = _("Article Plugin")
    render_template = "article/index.html"
    inlines = (ItemInlineAdmin,)

    def render(self, context, instance, placeholder):
        context = super().render(context, instance, placeholder)
        items = instance.associated_item.all()
        context.update({
            'items': items,
        })
        return context
```

Plugin form

Since *`cms.plugin_base.CMSPluginBase`* extends `django.contrib.admin.ModelAdmin`, you can customise the form for your plugins just as you would customise your admin interfaces.

The template that the plugin editing mechanism uses is `cms/templates/admin/cms/page/plugin/change_form.html`. You might need to change this.

If you want to customise this the best way to do it is:

- create a template of your own that extends `cms/templates/admin/cms/page/plugin/change_form.html` to provide the functionality you require;
- provide your *`cms.plugin_base.CMSPluginBase`* sub-class with a `change_form_template` attribute pointing at your new template.

Extending `admin/cms/page/plugin/change_form.html` ensures that you'll keep a unified look and functionality across your plugins.

There are various reasons *why* you might want to do this. For example, you might have a snippet of JavaScript that needs to refer to a template variable), which you'd likely place in `{% block extrahead %}`, after a `{{ block.super }}` to inherit the existing items that were in the parent template.

Handling media

If your plugin depends on certain media files, JavaScript or stylesheets, you can include them from your plugin template using django-sekizai. Your CMS templates are always enforced to have the `css` and `js` sekizai namespaces, therefore those should be used to include the respective files. For more information about django-sekizai, please refer to the django-sekizai documentation.

Note that sekizai **can't** help you with the **admin-side** plugin templates - what follows is for your plugins' **output templates**.

Sekizai style

To fully harness the power of django-sekizai, it is helpful to have a consistent style on how to use it. Here is a set of conventions that should be followed (but don't necessarily need to be):

- One bit per `addtoblock`. Always include one external CSS or JS file per `addtoblock` or one snippet per `addtoblock`. This is needed so django-sekizai properly detects duplicate files.
- External files should be on one line, with no spaces or newlines between the `addtoblock` tag and the HTML tags.
- When using embedded javascript or CSS, the HTML tags should be on a newline.

A **good** example:

```
{% load sekizai_tags %}

{% addtoblock "js" %}<script type="text/javascript" src="{{ MEDIA_URL }}myplugin/js/
↪myjsfile.js"></script>{% endaddtoblock %}
{% addtoblock "js" %}<script type="text/javascript" src="{{ MEDIA_URL }}myplugin/js/
↪myotherfile.js"></script>{% endaddtoblock %}
{% addtoblock "css" %}<link rel="stylesheet" type="text/css" href="{{ MEDIA_URL }}
↪myplugin/css/astylesheet.css">{% endaddtoblock %}
{% addtoblock "js" %}
<script type="text/javascript">
    $(document).ready(function(){
        doSomething();
    });
</script>
{% endaddtoblock %}
```

A **bad** example:

```
{% load sekizai_tags %}

{% addtoblock "js" %}<script type="text/javascript" src="{{ MEDIA_URL }}myplugin/js/
↪myjsfile.js"></script>
<script type="text/javascript" src="{{ MEDIA_URL }}myplugin/js/myotherfile.js"></script>{
↪% endaddtoblock %}
{% addtoblock "css" %}
```

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```
    <link rel="stylesheet" type="text/css" href="{{ MEDIA_URL }}myplugin/css/astylesheet.
↪css"></script>
{% endaddtoblock %}
{% addtoblock "js" %}<script type="text/javascript">
    $(document).ready(function(){
        doSomething();
    });
</script>{% endaddtoblock %}
```

Note: If the Plugin requires javascript code to be rendered properly, the class `'cms-execute-js-to-render'` can be added to the script tag. This will download and execute all scripts with this class, which weren't present before, when the plugin is first added to the page. If the javascript code is protected from prematurely executing by the EventListener for the event `'load'` and/or `'DOMContentLoaded'`, the following classes can be added to the script tag:

Classname	Corresponding javascript code
cms-trigger-event-document-DOMContentLoaded	`document.dispatchEvent(new Event('DOMContentLoaded')`
cms-trigger-event-window-DOMContentLoaded	`window.dispatchEvent(new Event('DOMContentLoaded')`
cms-trigger-event-window-load	`window.dispatchEvent(new Event('load')`

The events will be triggered once after all scripts are successfully injected into the DOM.

Note: Some plugins might need to run a certain bit of javascript after a content refresh. In such a case, you can use the `cms-content-refresh` event to take care of that, by adding something like:

```
{% if request.toolbar and request.toolbar.edit_mode_active %}
    <script>
    CMS.$(window).on('cms-content-refresh', function () {
        // Here comes your code of the plugin's javascript which
        // needs to be run after a content refresh
    });
    </script>
{% endif %}
```

Plugin Context

The plugin has access to the django template context. You can override variables using the `with` tag.

Example:

```
{% with 320 as width %}{% placeholder "content" %}{% endwith %}
```

Plugin Context Processors

Plugin context processors are callables that modify all plugins' context before rendering. They are enabled using the *CMS_PLUGIN_CONTEXT_PROCESSORS* setting.

A plugin context processor takes 3 arguments:

- `instance`: The instance of the plugin model
- `placeholder`: The instance of the placeholder this plugin appears in.
- `context`: The context that is in use, including the request.

The return value should be a dictionary containing any variables to be added to the context.

Example:

```
def add_verbose_name(instance, placeholder, context):
    '''
    This plugin context processor adds the plugin model's verbose_name to context.
    '''
    return {'verbose_name': instance._meta.verbose_name}
```

Plugin Processors

Plugin processors are callables that modify all plugins' output after rendering. They are enabled using the *CMS_PLUGIN_PROCESSORS* setting.

A plugin processor takes 4 arguments:

- `instance`: The instance of the plugin model
- `placeholder`: The instance of the placeholder this plugin appears in.
- `rendered_content`: A string containing the rendered content of the plugin.
- `original_context`: The original context for the template used to render the plugin.

Note: Plugin processors are also applied to plugins embedded in Text plugins (and any custom plugin allowing nested plugins). Depending on what your processor does, this might break the output. For example, if your processor wraps the output in a `<div>` tag, you might end up having `<div>` tags inside of `<p>` tags, which is invalid. You can prevent such cases by returning `rendered_content` unchanged if `instance._render_meta.text_enabled` is `True`, which is the case when rendering an embedded plugin.

Example

Suppose you want to wrap each plugin in the main placeholder in a colored box but it would be too complicated to edit each individual plugin's template:

In your `settings.py`:

```
CMS_PLUGIN_PROCESSORS = (
    'yourapp.cms_plugin_processors.wrap_in_colored_box',
)
```

In your `yourapp.cms_plugin_processors.py`:

```
def wrap_in_colored_box(instance, placeholder, rendered_content, original_context):
    '''
    This plugin processor wraps each plugin's output in a colored box if it is in the
↪"main" placeholder.
    '''
    # Plugins not in the main placeholder should remain unchanged
    # Plugins embedded in Text should remain unchanged in order not to break output
    if placeholder.slot != 'main' or (instance._render_meta.text_enabled and instance.
↪parent):
        return rendered_content
    else:
        from django.template import Context, Template
        # For simplicity's sake, construct the template from a string:
        t = Template('<div style="border: 10px {{ border_color }} solid; background: {{␣
↪background_color }};">{{ content|safe }}</div>')
        # Prepare that template's context:
        c = Context({
            'content': rendered_content,
            # Some plugin models might allow you to customise the colors,
            # for others, use default colors:
            'background_color': instance.background_color if hasattr(instance,
↪'background_color') else 'lightyellow',
            'border_color': instance.border_color if hasattr(instance, 'border_color')␣
↪else 'lightblue',
        })
        # Finally, render the content through that template, and return the output
        return t.render(c)
```

Nested Plugins

You can nest CMS Plugins in themselves. There's a few things required to achieve this functionality:

`models.py`:

```
class ParentPlugin(CMSPlugin):
    # add your fields here

class ChildPlugin(CMSPlugin):
    # add your fields here
```

`cms_plugins.py`:

```
from .models import ParentPlugin, ChildPlugin


@plugin_pool.register_plugin
class ParentCMSPlugin(CMSPluginBase):
    render_template = "parent.html"
    name = "Parent"
    model = ParentPlugin
    allow_children = True  # This enables the parent plugin to accept child plugins
    # You can also specify a list of plugins that are accepted as children,
```

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```
    # or leave it away completely to accept all
    # child_classes = ['ChildCMSPlugin']

    def render(self, context, instance, placeholder):
        context = super().render(context, instance, placeholder)
        return context


@plugin_pool.register_plugin
class ChildCMSPlugin(CMSPluginBase):
    render_template = "child.html"
    name = "Child"
    model = ChildPlugin
    require_parent = (
        True  # Is it required that this plugin is a child of another plugin?
    )
    # You can also specify a list of plugins that are accepted as parents,
    # or leave it away completely to accept all
    # parent_classes = ['ParentCMSPlugin']

    def render(self, context, instance, placeholder):
        context = super(ChildCMSPlugin, self).render(context, instance, placeholder)
        return context
```

parent.html:

```
{% load cms_tags %}

<div class="plugin parent">
    {% for plugin in instance.child_plugin_instances %}
        {% render_plugin plugin %}
    {% endfor %}
</div>
```

child.html:

```
<div class="plugin child">
    {{ instance }}
</div>
```

If you have attributes of the parent plugin which you need to access in the child you can access the parent instance using get_bound_plugin:

```
class ChildPluginForm(forms.ModelForm):

    class Meta:
        model = ChildPlugin
        exclude = ()

    def __init__(self, *args, **kwargs):
        super().__init__(*args, **kwargs)
        if self.instance:
            parent, parent_cls = self.instance.parent.get_bound_plugin()
```

Extending context menus of placeholders or plugins

There are three possibilities to extend the context menus of placeholders or plugins.

- You can either extend a placeholder context menu.
- You can extend all plugin context menus.

For this purpose you can overwrite the two methods on CMSPluginBase.

- *get_extra_placeholder_menu_items()*
- *get_extra_plugin_menu_items()*

Example:

```
class AliasPlugin(CMSPluginBase):
    name = _("Alias")
    allow_children = False
    model = AliasPluginModel
    render_template = "cms/plugins/alias.html"

    def render(self, context, instance, placeholder):
        context = super().render(context, instance, placeholder)
        if instance.plugin_id:
            plugins = instance.plugin.get_descendants(
                include_self=True
            ).order_by('placeholder', 'tree_id', 'level', 'position')
            plugins = downcast_plugins(plugins)
            plugins[0].parent_id = None
            plugins = build_plugin_tree(plugins)
            context['plugins'] = plugins
        if instance.alias_placeholder_id:
            content = render_placeholder(instance.alias_placeholder, context)
            print content
            context['content'] = mark_safe(content)
        return context

    def get_extra_plugin_menu_items(self, request, plugin):
        return [
            PluginMenuItem(
                _("Create Alias"),
                reverse("admin:cms_create_alias"),
                data={
                    'plugin_id': plugin.pk,
                    'csrfmiddlewaretoken': get_token(request)
                },
            )
        ]

    def get_extra_placeholder_menu_items(self, request, placeholder):
        return [
            PluginMenuItem(
                _("Create Alias"),
                reverse("admin:cms_create_alias"),
                data={
```

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```
                    'placeholder_id': placeholder.pk,
                    'csrfmiddlewaretoken': get_token(request)
                },
            )
        ]

    def get_plugin_urls(self):
        urlpatterns = [
            re_path(r'^create_alias/$', self.create_alias, name='cms_create_alias'),
        ]
        return urlpatterns

    def create_alias(self, request):
        if not request.user.is_staff:
            return HttpResponseForbidden("not enough privileges")
        if not 'plugin_id' in request.POST and not 'placeholder_id' in request.POST:
            return HttpResponseBadRequest(
                "plugin_id or placeholder_id POST parameter missing."
            )
        plugin = None
        placeholder = None
        if 'plugin_id' in request.POST:
            pk = request.POST['plugin_id']
            try:
                plugin = CMSPlugin.objects.get(pk=pk)
            except CMSPlugin.DoesNotExist:
                return HttpResponseBadRequest(
                    "plugin with id %s not found." % pk
                )
        if 'placeholder_id' in request.POST:
            pk = request.POST['placeholder_id']
            try:
                placeholder = Placeholder.objects.get(pk=pk)
            except Placeholder.DoesNotExist:
                return HttpResponseBadRequest(
                    "placeholder with id %s not found." % pk
                )
            if not placeholder.has_change_permission(request):
                return HttpResponseBadRequest(
                    "You do not have enough permission to alias this placeholder."
                )
        clipboard = request.toolbar.clipboard
        clipboard.cmsplugin_set.all().delete()
        language = request.LANGUAGE_CODE
        if plugin:
            language = plugin.language
        alias = AliasPluginModel(
            language=language, placeholder=clipboard,
            plugin_type="AliasPlugin"
        )
        if plugin:
            alias.plugin = plugin
```

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```
        if placeholder:
            alias.alias_placeholder = placeholder
        alias.save()
        return HttpResponse("ok")
```

Creating and deleting plugin instances

New in version 4.0.

Plugins live inside placeholders. Since django CMS version 4 placeholders manage the creation, and especially the deletion of plugins. Besides creating (or deleting) database entries for the plugins the placeholders make all necessary changes to the entire plugin tree. **Not using the placeholders to create or delete plugins can lead to corrupted plugin trees.**

- Use *cms.models.placeholdermodel.Placeholder.add_plugin()* or *cms.api.add_plugin()* to create plugins:

  ```
  new_instance = MyPluginModel(
      plugin_data="secret"
      placeholder=placeholder_to_add_to,
      position=1,  # First plugin in placeholder
  )

  placeholder_to_add_to.add_plugin(new_instance)
  assert new_instance_pk is not None  # Saved to db
  ```

  or:

  ```
  new_plugin = cms.api.add_plugin(
      placeholder_to_add_to,
      "MyPlugin",
      position='first-child',  # First position in placeholder (no parent)
      data=dict(plugin_data="secret"),
  )
  ```

- **Use *cms.models.placeholdermodel.Placeholder.delete_plugin()* to delete a plugin including its children**:

  ```
  old_instance.placeholder.delete_plugin(old_instance)
  ```

> **Warning:** **Do not** use `PluginModel.objects.create(...)` or `PluginModel.objects.delete()` to create or delete plugin instances. This most likely either throw a database integrity exception or create a inconsistent plugin tree leading to unexpected behavior.
>
> Also, **do not** use `queryset.delete()` to remove multiple plugins at the same time. This will most likely damage the plugin tree.

How to upgrade custom plugins for django CMS v4+

Difference between django CMS v3 and v4 plugins

The main difference between plugins of django CMS version 3 and django CMS v4 is how the tree is stored in the database. Up to django CMS version 3, the plugin model *CMSPlugin* inherited from a tree model `MP_Node` declared in the django-treebeard library.

As of django CMS version 4, *CMSPlugin* inherits directly from `django.db.models.Model` and manages the tree structure with the two fields *parent* and *position* using SQL Common Table Expressions (CTE) which allow recursive SQL statements. Consequently all model fields originating with treebeard are not available in django CMS v4+.

> **Warning:** Django CMS 4 removes the following fields form *CMSPlugin*:
>
> - `depth`
> - `numchild`
> - `path`

Also, the meaning of the *position* field has changed. Im django CMS v3 it was unique for each *parent* value (including `None` for plugins at root level). From django CMS v4 on, it is unique for each *placeholder* and *language* entry. Also, positions are counted from 1 to *n* for all *n* plugins of a placeholder language combination. There must not be gaps in the position field (i.e., a missing position value).

> **Warning:** Since the management of the plugin tree happens within the CMS it is important to use the new placeholder API described in the section *Creating and deleting plugin instances* to create and delete plugins.

What to change

The good news is that most custom plugins will *not* require any changes. This is unless they either directly **access one of the django-treebeard fields** or they **create or delete plugins programmatically**.

Replacing access to django-treebeard fields

If your custom plugin accesses django-treebeard field directly, you will have to change your code. How to do this obviously depends on what your code needs to achieve. Here are some examples:

`path`

To order a queryset of plugins replace `qs.orderby("path")` by `qs.orderby("position")`.

depth

There is no correspondence to the `depth` field. If needed, it has to be computed:

```
@property
def depth(self):
    if self.parent is None:
        return 1
    return self.parent.depth + 1
```

position

Often changes are made at the leaves of the tree. If you happen to know that the parent plugin does not have grant-children, the quick way to get a django CMS 3 position value is:

```
plugin.position - plugin.parent.position if plugin.parent else plugin.position
```

To calculate the `position` field valid for all cases, you can use this code bit:

```
@property
def v3position(self):
    siblings = CMSPlugin.objects.filter(parent=self.parent).orderby("position")
    pos = 1
    for plugin in siblings:
        if plugin == self:
            return pos
        pos += 1
```

Creating or deleting plugins programmatically

To create a plugin, first build an instance, then add it to its placeholder:

```
my_new_plugin = MyPluginModel(parent=None, position=1, my_config="whatever",␣
↪placeholder=my_placholder)
my_placeholder.add_plugin(my_new_plugin)
```

This example puts the plugin at the first position if the placeholder. Those shortcuts might help:

Position	Meaning
`position=parent.position + 1`	First child of `parent`
`position=parent.position + n`	*n* th child of `parent` if parent does **not** have grand-children
`position=placeholder.get_last_plugin_position(language="en") + 1`	Last plugin in placeholder

> **Warning:** Do **not** use `MyPluginModel.objects.create()`. It will almost certainly throw a database integrity exception.

Creating "universal" plugins

Some packages introduce universal plugins which can be used both on django CMS 3 and django CMS 4 alike. Examples include djangocms-text-ckeditor or djangocms-frontend.

Here is an excerpt from djangocms-text-ckeditor which needs to be able to create and delete child plugins for text fields. It adds private static methods to

```
@staticmethod
def _create_ghost_plugin(placeholder, plugin):
    """CMS version-save function to add a plugin to a placeholder"""
    if hasattr(placeholder, "add_plugin"):  # available as of CMS v4
        placeholder.add_plugin(plugin)
    else:  # CMS < v4
        plugin.save()  # Plugin is created upon save
```

Similarly, it deletes plugins:

```
@staticmethod
def _delete_plugin(plugin):
    """Version-safe plugin delete method"""
    placeholder = plugin.placeholder
    if hasattr(placeholder, 'delete_plugin'):  # since CMS v4
        return placeholder.delete_plugin(plugin)
    else:
        return plugin.delete()
```

Note: Please consider the different counting schemes for the *position* field.

Adapting your test suite

Test suites often create pages, add plugins that are to be tested, and publish the pages. Since publishing in django CMS 4 is not part of the core any more, a way updating the test suites is to add a test fixture to your tests that provide publish and unpublish functionality.

In the tests themselves all `page.publish()` calls then need to be replaced by `self.publis(page)` calls to the fixture.

Here's an example of test fixture (from djangocms-frontend)

```
from packaging.version import Version

from cms import __version__

DJANGO_CMS4 = Version(__version__) >= Version("4")


class TestFixture:
    """Sets up generic setUp and tearDown methods for tests."""

    if DJANGO_CMS4:  # CMS V4
        def _get_version(self, grouper, version_state, language=None):
            language = language or self.language
```

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```
        from djangocms_versioning.models import Version

        versions = Version.objects.filter_by_grouper(grouper).filter(
            state=version_state
        )
        for version in versions:
            if (
                hasattr(version.content, "language")
                and version.content.language == language
            ):
                return version

    def publish(self, grouper, language=None):
        from djangocms_versioning.constants import DRAFT

        version = self._get_version(grouper, DRAFT, language)
        if version is not None:
            version.publish(self.superuser)

    def unpublish(self, grouper, language=None):
        from djangocms_versioning.constants import PUBLISHED

        version = self._get_version(grouper, PUBLISHED, language)
        if version is not None:
            version.unpublish(self.superuser)

    def create_page(self, title, **kwargs):
        kwargs.setdefault("language", self.language)
        kwargs.setdefault("created_by", self.superuser)
        kwargs.setdefault("in_navigation", True)
        kwargs.setdefault("limit_visibility_in_menu", None)
        kwargs.setdefault("menu_title", title)
        return create_page(title=title, **kwargs)

    def get_placeholders(self, page):
        return page.get_placeholders(self.language)

else:  # CMS V3
    def publish(self, page, language=None):
        page.publish(language)

    def unpublish(self, page, language=None):
        page.unpublish(language)

    def create_page(self, title, **kwargs):
        kwargs.setdefault("language", self.language)
        kwargs.setdefault("menu_title", title)
        return create_page(title=title, **kwargs)

    def get_placeholders(self, page):
        return page.get_placeholders()
```

How to create apphooks

An **apphook** allows you to attach a Django application to a page. For example, you might have a news application that you'd like integrated with django CMS. In this case, you can create a normal django CMS page without any content of its own, and attach the news application to the page; the news application's content will be delivered at the page's URL.

All URLs in that URL path will be passed to the attached application's URL configs.

The *Tutorials* section contains a basic guide to *getting started with apphooks*. This document assumes more familiarity with the CMS generally.

The basics of apphook creation

To create an apphook, create a `cms_apps.py` file in your application.

The file needs to contain a *CMSApp* sub-class. For example:

```
from cms.app_base import CMSApp
from cms.apphook_pool import apphook_pool

@apphook_pool.register
class MyApphook(CMSApp):
    app_name = "myapp"  # must match the application namespace
    name = "My Apphook"

    def get_urls(self, page=None, language=None, **kwargs):
        return ["myapp.urls"] # replace this with the path to your application's URLs␣
↪module
```

Apphooks for namespaced applications

Your application should use namespaced URLs.

In the example above, the application uses the `myapp` namespace. Your `CMSApp` sub-class **must reflect the application's namespace** in the `app_name` attribute.

The application may specify a namespace by supplying an `app_name` in its `urls.py`, or its documentation might advise that you when include its URLs, you do it thus:

```
path("myapp/", include("myapp.urls", app_name="myapp"))
```

If you fail to do this, then any templates in the application that invoke URLs using the form `{% url 'myapp:index' %}` or views that call (for example) `reverse('myapp:index')` will throw a `NoReverseMatch` error.

Apphooks for non-namespaced applications

If you are writing apphooks for third-party applications, you may find one that in fact does not have an application namespace for its URLs. Such an application is liable to tun into namespace conflicts, and doesn't represent good practice.

However if you *do* encounter such an application, your own apphook for it will need in turn to forgo the `app_name` attribute.

Note that unlike apphooks without `app_name` attributes can be attached only to one page at a time; attempting to apply them a second time will cause an error. Only one instance of these apphooks can exist.

See *Attaching an application multiple times* for more on having multiple apphook instances.

Returning apphook URLs manually

Instead of defining the URL patterns in another file `myapp/urls.py`, it also is possible to return them manually, for example if you need to override the set provided. An example:

```
from django.urls import path
from myapp.views import SomeListView, SomeDetailView


class MyApphook(CMSApp):
    # ...
    def get_urls(self, page=None, language=None, **kwargs):
        return [
            path("<str:slug>/", SomeDetailView.as_view()),
            path("", SomeListView.as_view()),
        ]
```

However, it's much neater to keep them in the application's `urls.py`, where they can easily be reused.

Loading new and re-configured apphooks

Certain apphook-related changes require server restarts in order to be loaded.

Whenever you:

- add or remove an apphook
- change the slug of a page containing an apphook or the slug of a page which has a descendant with an apphook

the URL caches must be reloaded.

If you have the *cms.middleware.utils.ApphookReloadMiddleware* installed, which is recommended, the server will do it for you by re-initialising the URL patterns automatically.

Otherwise, you will need to restart the server manually.

Using an apphook

Once your apphook has been set up and loaded, you'll now be able to select the *Application* that's hooked into that page from its *Advanced settings*.

Note: An apphook won't actually do anything until the page it belongs to is published. Take note that this also means all parent pages must also be published.

The apphook attaches all of the apphooked application's URLs to the page; its root URL will be the page's own URL, and any lower-level URLs will be on the same URL path.

So, given an application with the `urls.py` for the views `index_view` and `archive_view`:

```
urlpatterns = [
    path('archive/', archive_view),
    path('', index_view),
]
```

attached to a page whose URL path is `/hello/world/`, the views will be exposed as follows:

- `index_view` at `/hello/world/`
- `archive_view` at `/hello/world/archive/`

Sub-pages of an apphooked page

Important: Don't add child pages to a page with an apphook.

The apphook "swallows" all URLs below that of the page, handing them over to the attached application. If you have any child pages of the apphooked page, django CMS will not be able to serve them reliably.

Managing apphooks

Uninstalling an apphook with applied instances

If you remove an apphook class from your system (in effect uninstalling it) that still has instances applied to pages, django CMS tries to handle this as gracefully as possible:

- Affected pages still maintain a record of the applied apphook; if the apphook class is subsequently reinstated, it will work as before.
- The page list will show apphook indicators where appropriate.
- The page will otherwise behave like a normal django CMS page, and display its placeholders in the usual way.
- If you save the page's *Advanced settings*, the apphook will be removed.

Management commands

You can clear uninstalled apphook instances using the CMS management command `uninstall apphooks`. For example:

```
python -m manage cms uninstall apphooks MyApphook MyOtherApphook
```

You can get a list of installed apphooks using the *cms list*; in this case:

```
python -m manage cms list apphooks
```

See the *Management commands reference* for more information.

Adding menus to apphooks

Generally, it is recommended to allow the user to control whether a menu is attached to a page (See *Attach Menus* for more on these menus). However, an apphook can be made to do this automatically if required. It will behave just as if the menu had been attached to the page using its *Advanced settings*).

Menus can be added to an apphook using the `get_menus()` method. On the basis of the example above:

```
# [...]
from myapp.cms_menus import MyAppMenu

class MyApphook(CMSApp):
    # [...]
    def get_menus(self, page=None, language=None, **kwargs):
        return [MyAppMenu]
```

Changed in version 3.3: `CMSApp.get_menus()` replaces `CMSApp.menus`. The `menus` attribute is now deprecated and has been removed in version 3.5.

The menus returned in the `get_menus()` method need to return a list of nodes, in their `get_nodes()` methods. *Attach Menus* has more information on creating menu classes that generate nodes.

You can return multiple menu classes; all will be attached to the same page:

```
def get_menus(self, page=None, language=None, **kwargs):
    return [MyAppMenu, CategoryMenu]
```

Managing permissions on apphooks

By default the content represented by an apphook has the same permissions set as the page it is assigned to. So if for example a page requires the user to be logged in, then the attached apphook and all its URLs will have the same requirements.

To disable this behaviour set `permissions = False` on your apphook:

```
class MyApphook(CMSApp):
    [...]
    permissions = False
```

If you still want some of your views to use the CMS's permission checks you can enable them via a decorator, `cms.utils.decorators.cms_perms`

Here is a simple example:

```
from cms.utils.decorators import cms_perms

@cms_perms
def my_view(request, **kw):
    ...
```

If you make your own permission checks in your application, then use the `exclude_permissions` property of the apphook:

```
class MyApphook(CMSApp):
    [...]
    permissions = True
    exclude_permissions = ["some_nested_app"]
```

where you provide the name of the application in question

Automatically restart server on apphook changes

As mentioned above, whenever you:

- add or remove an apphook
- change the slug of a page containing an apphook
- change the slug of a page with a descendant with an apphook

The CMS the server will reload its URL caches. It does this by listening for the signal `cms.signals.urls_need_reloading`.

> **Warning:** This signal does not actually do anything itself. For automated server restarting you need to implement logic in your project that gets executed whenever this signal is fired. Because there are many ways of deploying Django applications, there is no way we can provide a generic solution for this problem that will always work.
>
> The signal is fired **after** a request - for example, upon saving a page's settings. If you change and apphook's setting via an API the signal will not fire until a subsequent request.

Apphooks and placeholder template tags

It's important to understand that while an apphooked application takes over the CMS page at that location completely, depending on how the application's templates extend other templates, a django CMS `{% placeholder %}` template tag may be invoked - **but will not work**.

How to manage complex apphook configuration

In *How to create apphooks* we discuss some basic points of using apphooks. In this document we will cover some more complex implementation possibilities.

Attaching an application multiple times

Define a namespace at class-level

If you want to attach an application multiple times to different pages, then the class defining the apphook *must* have an `app_name` attribute:

```
class MyApphook(CMSApp):
    name = _("My Apphook")
    app_name = "myapp"

    def get_urls(self, page=None, language=None, **kwargs):
        return ["myapp.urls"]
```

The `app_name` does three key things:

- It provides the *fallback namespace* for views and templates that reverse URLs.
- It exposes the *Application instance name* field in the page admin when applying an apphook.
- It sets the *default apphook instance name* (which you'll see in the *Application instance name* field).

We'll explain these with an example. Let's suppose that your application's views or templates use `reverse('myapp:index')` or `{% url 'myapp:index' %}`.

In this case the namespace of any apphooks you apply must match `myapp`. If they don't, your pages using them will throw up a `NoReverseMatch` error.

You can set the namespace for the instance of the apphook in the *Application instance name* field. However, you'll need to set that to something *different* if an instance with that value already exists. In this case, as long as `app_name = "myapp"` it doesn't matter; even if the system doesn't find a match with the name of the instance it will fall back to the one hard-wired into the class.

In other words setting `app_name` correctly guarantees that URL-reversing will work, because it sets the fallback namespace appropriately.

Set a namespace at instance-level

On the other hand, the *Application instance name* will override the `app_name` *if* a match is found.

This arrangement allows you to use multiple application instances and namespaces if that flexibility is required, while guaranteeing a simple way to make it work when it's not.

Django's Reversing namespaced URLs documentation provides more information on how this works, but the simplified version is:

1. First, it will try to find a match for the *Application instance name*.
2. If it fails, it will try to find a match for the `app_name`.

Apphook configurations

Namespacing your apphooks also makes it possible to manage additional database-stored apphook configuration, on an instance-by-instance basis.

Basic concepts

To capture the configuration that different instances of an apphook can take, a Django model needs to be created - each apphook instance will be an instance of that model, and administered through the Django admin in the usual way.

Once set up, an apphook configuration can be applied to to an apphook instance, in the *Advanced settings* of the page the apphook instance belongs to:

The configuration is then loaded in the application's views for that namespace, and will be used to determined how it behaves.

Creating an application configuration in fact creates an apphook instance namespace. Once created, the namespace of a configuration cannot be changed - if a different namespace is required, a new configuration will also need to be created.

An example apphook configuration

In order to illustrate how this all works, we'll create a new FAQ application, that provides a simple list of questions and answers, together with an apphook class and an apphook configuration model that allows it to exist in multiple places on the site in multiple configurations.

We'll assume that you have a working django CMS project running already.

Create the new FAQ application

Let us quickly create the new app:

1. **Create a new app in your project**:

```
python -m manage startapp faq
```

2. **Create a model for the app config in ``models.py``**: The app config will be identified by its namespace.

```
from django.db import models
from django.utils.translation import gettext_lazy as _


class FaqConfigModel(models.Model):
    namespace = models.CharField(
        _("instance namespace"),
        default=None,
        max_length=100,
```

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```
        unique=True,
    )

    paginate_by = models.PositiveIntegerField(
        _("paginate size"),
        blank=False,
        default=5,
    )
```

3. **Create the FAQ model** also in `models.py`: All entries will be assigned to an instance of the app hook.

```
class Entry(models.Model):
    app_config = models.ForeignKey(FaqConfigModel, null=False)  # We need to assign␣
↪an FAQ entry to its app instance
    question = models.TextField(blank=True, default='')
    answer = models.TextField()

    def __str__(self):
        return self.question or "<Empty question>"

    class Meta:
        verbose_name_plural = 'entries'
```

4. **Create the FAQ CMS app**: In the apps's `cms_apps.py` create the `FaqConfig` class. This extensions tells django CMS how to get the app config instances.

```
from django.core.exceptions import ObjectDoesNotExist
from django.urls import reverse

from cms.app_base import CMSApp
from cms.apphook_pool import apphook_pool

from .models import FaqConfigModel


@apphook_pool.register
class FaqConfig(CMSApp):
    name = "FAQ"
    app_config = FaqConfigModel

    def get_urls(self, page=None, language=None, **kwargs):
        return ["faq.urls"]

    def get_configs(self):
        return self.app_config.objects.all()

    def get_config(self, namespace):
        try:
            return self.app_config.objects.get(namespace=namespace)
        except ObjectDoesNotExist:
            return None
```

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```
    def get_config_add_url(self):
        try:
            return reverse("admin:{}_{}_add".format(self.app_config._meta.app_label,␣
↪self.app_config._meta.model_name))
        except AttributeError:
            return reverse(
                "admin:{}_{}_add".format(self.app_config._meta.app_label, self.app_
↪config._meta.module_name)
            )
```

5. **Add models to the admin interface**: Its admin properties are defined in `admin.py`:

```
from django.contrib import admin

from . import models


@admin.register(models.Entry)
class EntryAdmin(admin.ModelAdmin):
    list_display = (
        'question',
        'answer',
        'app_config',
    )
    list_filter = (
        'app_config',
    )


@admin.register(models.FaqConfigModel)
class FaqConfigAdmin(admin.ModelAdmin):
    pass
```

6. **Create a simple list view** in `views.py`: For the views there is a catch: The view will have to determine which app instance it is showing. Here's a short reusable mixin to help with that:

```
from django.views.generic import ListView
from django.urls import Resolver404, resolve
from django.utils.translation import override

from cms.apphook_pool import apphook_pool
from cms.utils import get_language_from_request

from . import models


def get_app_instance(request):
    namespace, config = "", None
    if getattr(request, "current_page", None) and request.current_page.application_
↪urls:
        app = apphook_pool.get_apphook(request.current_page.application_urls)
        if app and app.app_config:
```

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```
            try:
                config = None
                with override(get_language_from_request(request)):
                    if hasattr(request, "toolbar") and hasattr(request.toolbar,
↪"request_path"):
                        path = request.toolbar.request_path  # If v4 endpoint take␣
↪request_path from toolbar
                    else:
                        path = request.path_info
                    namespace = resolve(path).namespace
                    config = app.get_config(namespace)
            except Resolver404:
                pass
    return namespace, config


class AppHookConfigMixin:
    def dispatch(self, request, *args, **kwargs):
        # get namespace and config
        self.namespace, self.config = get_app_instance(request)
        request.current_app = self.namespace
        return super().dispatch(request, *args, **kwargs)

    def get_queryset(self):
        qs = super().get_queryset()
        return qs.filter(app_config__namespace=self.namespace)


class IndexView(AppHookConfigMixin, ListView):
    model = models.Entry
    template_name = 'faq/index.html'

    def get_paginate_by(self, queryset):
        try:
            return self.config.paginate_by
        except AttributeError:
            return 10
```

7. **Declare the app's URLs** in `urls.py`: .. code-block:

```
from django.urls import path
from . import views


urlpatterns = [
    path("", views.IndexView.as_view(), name='index'),
]
```

8. Finally, **create a template for the index view**: .. code-block:

```
{% extends 'base.html' %}
```

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```
{% block content %}
    <h1>Namespace: {{ view.namespace }}</h1>
    <dl>
        {% for entry in object_list %}
            <dt>{{ entry.question }}</dt>
            <dd>{{ entry.answer }}</dd>
        {% endfor %}
    </dl>

    {% if is_paginated %}
        <div class="pagination">
            <span class="step-links">
                {% if page_obj.has_previous %}
                    <a href="?page={{ page_obj.previous_page_number }}">previous</a>
                {% else %}
                    previous
                {% endif %}

                <span class="current">
                    Page {{ page_obj.number }} of {{ page_obj.paginator.num_pages }}
↪.
                </span>

                {% if page_obj.has_next %}
                    <a href="?page={{ page_obj.next_page_number }}">next</a>
                {% else %}
                    next
                {% endif %}
            </span>
        </div>
    {% endif %}
{% endblock %}
```

Put it all together

Finally, we add `"faq"` to `INSTALLED_APPS`, then create and run migrations:

```
python -m manage makemigrations faq
python -m manage migrate faq
```

Now we should be all set.

Create two pages with the faq apphook, with different namespaces and different configurations. Also create some entries assigned to the two namespaces.

You can experiment with the different configured behaviours (in this case, only pagination is available), and the way that different Entry instances can be associated with a specific apphook.

How to extend the Toolbar

The django CMS toolbar provides an API that allows you to add, remove and manipulate toolbar items in your own code. It helps you to integrate django CMS's frontend editing mode into your application, and provide your users with a streamlined editing experience.

See also:

- *Extending the Toolbar* in the tutorial
- *Toolbar API reference*

Create a `cms_toolbars.py` file

In order to interact with the toolbar API, you need to create a *`CMSToolbar`* sub-class in your own code, and register it.

This class should be created in your application's `cms_toolbars.py` file, where it will be discovered automatically when the Django runserver starts.

You can also use the *`CMS_TOOLBARS`* to control which toolbar classes are loaded.

Use the high-level toolbar APIs

You will find a `toolbar` object in the request in your views, and you may be tempted to do things with it, like:

```
toolbar = request.toolbar
toolbar.add_modal_button('Do not touch', dangerous_button_url)
```

- but you should not, in the same way that it is not recommended to poke tweezers into electrical sockets just because you can.

Instead, you should **only** interact with the toolbar using a `CMSToolbar` class, and the *documented APIs for managing it*.

Similarly, although a generic *`add_item()`* method is available, we provide higher-level methods for handling specific item types, and it is always recommended that you use these instead.

Define and register a `CMSToolbar` sub-class

```
from cms.toolbar_base import CMSToolbar
from cms.toolbar_pool import toolbar_pool

class MyToolbarClass(CMSToolbar):
    [...]

toolbar_pool.register(MyToolbarClass)
```

The `cms.toolbar_pool.ToolbarPool.register` method can also be used as a decorator:

```
@toolbar_pool.register
class MyToolbarClass(CMSToolbar):
    [...]
```

Populate the toolbar

Two methods are available to control what will appear in the django CMS toolbar:

- `populate()`, which is called *before* the rest of the page is rendered
- `post_template_populate()`, which is called *after* the page's template is rendered

The latter method allows you to manage the toolbar based on the contents of the page, such as the state of plugins or placeholders, but unless you need to do this, you should opt for the more simple `populate()` method.

```
class MyToolbar(CMSToolbar):

    def populate(self):

        # add items to the toolbar
```

Now you have to decide exactly what items will appear in your toolbar. These can include:

- *menus*
- *buttons* and button lists
- various other toolbar items

Add links and buttons to the toolbar

You can add links and buttons as entries to a menu instance, using the various `add_` methods.

Action	Text link variant	Button variant
Open link	*add_link_item()*	*add_button()*
Open link in sideframe	*add_sideframe_item()*	*add_sideframe_button()*
Open link in modal	*add_modal_item()*	*add_modal_button()*
POST action	*add_ajax_item()*	

The basic form for using any of these is:

```
def populate(self):

    self.toolbar.add_link_item( # or add_button(), add_modal_item(), etc
        name='A link',
        url=url
        )
```

Note that although these toolbar items may take various positional arguments in their methods, **we strongly recommend using named arguments**, as above. This will help ensure that your own toolbar classes and methods survive upgrades. See the reference documentation linked to in the table above for details of the signature of each method.

Opening a URL in an iframe

A common case is to provide a URL that opens in a sideframe or modal dialog on the same page. *Administration...* in the site menu, that opens the Django admin in a sideframe, is a good example of this. Both the sideframe and modal are HTML iframes.

A typical use for a sideframe is to display an admin list (similar to that used in the *tutorial example*):

```
from cms.utils.urlutils import admin_reverse
[...]

class PollToolbar(CMSToolbar):

    def populate(self):

        self.toolbar.add_sideframe_item(
            name='Poll list',
            url=admin_reverse('polls_poll_changelist')
            )
```

A typical use for a modal item is to display the admin for a model instance:

```
self.toolbar.add_modal_item(name='Add new poll', url=admin_reverse('polls_poll_add'))
```

However, you are not restricted to these examples, and you may open any suitable resource inside the modal or sideframe. Note that protocols may need to match and the requested resource must allow it.

Adding buttons to the toolbar

A button is a sub-class of *cms.toolbar.items.Button*

Buttons can also be added in a list - a *ButtonList* is a group of visually-linked buttons.

```
def populate(self):

    button_list = self.toolbar.add_button_list()
    button_list.add_button(name='Button 1', url=url_1)
    button_list.add_button(name='Button 2', url=url_2)
```

Create a toolbar menu

The text link items described above can also be added as nodes to menus in the toolbar.

A menu is an instance of *cms.toolbar.items.Menu*. In your `CMSToolbar` sub-class, you can either create a menu, or identify one that already exists (in order to add new items to it, for example), in the `populate()` or `post_template_populate()` methods, using *get_or_create_menu()*.

```
def populate(self):
    menu = self.toolbar.get_or_create_menu(
        key='polls_cms_integration',
        verbose_name='Polls'
        )
```

The `key` is unique menu identifier; `verbose_name` is what will be displayed in the menu. If you know a menu already exists, you can obtain it with *get_menu()*.

Note: It's recommended to namespace your `key` with the application name. Otherwise, another application could unexpectedly interfere with your menu.

Once you have your menu, you can add items to it in much the same way that you add them to the toolbar. For example:

```
def populate(self):
    menu = [...]

    menu.add_sideframe_item(
        name='Poll list',
        url=admin_reverse('polls_poll_changelist')
    )
```

To add a menu divider

add_break() will place a *Break*, a visual divider, in a menu list, to allow grouping of items. For example:

```
menu.add_break(identifier='settings_section')
```

To add a sub-menu

A sub-menu is a menu that belongs to another `Menu`:

```
def populate(self):
    menu = [...]

    submenu = menu.get_or_create_menu(
        key='sub_menu_key',
        verbose_name='My sub-menu'
        )
```

You can then add items to the sub-menu in the same way as in the examples above. Note that a sub-menu is an instance of *SubMenu*, and may not itself have further sub-menus.

Finding existing toolbar items

`get_or_create_menu()` and `get_menu()`

A number of methods and useful constants exist to get hold of and manipulate existing toolbar items. For example, to find (using `get_menu()`) and rename the *Site* menu:

```
from cms.cms_toolbars import ADMIN_MENU_IDENTIFIER

class ManipulativeToolbar(CMSToolbar):

    def populate(self):
```

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```
        admin_menu = self.toolbar.get_menu(ADMIN_MENU_IDENTIFIER)

        admin_menu.name = "Site"
```

`get_or_create_menu()` will equally well find the same menu, and also has the advantages that:

- it can update the item's attributes itself (`self.toolbar.get_or_create_menu(ADMIN_MENU_IDENTIFIER, 'Site')`)
- if the item doesn't exist, it will create it rather than raising an error.

`find_items()` and `find_first()`

Search for items by their type:

```
def populate(self):

    self.toolbar.find_items(item_type=LinkItem)
```

will find all `LinkItem`s in the toolbar (but not for example in the menus in the toolbar - it doesn't search *other* items in the toolbar for items of their own).

`find_items()` returns a list of *`ItemSearchResult`* objects; *`find_first()`* returns the first object in that list. They share similar behaviour so the examples here will use `find_items()` only.

The `item_type` argument is always required, but you can refine the search by using their other attributes, for example:

```
self.toolbar.find_items(Menu, disabled=True))
```

Note that you can use these two methods to search `Menu` and `SubMenu` classes for items too.

Control the position of items in the toolbar

Methods to add menu items to the toolbar take an optional *`position`* argument, that can be used to control where the item will be inserted.

By default (`position=None`) the item will be inserted after existing items in the same level of the hierarchy (a new sub-menu will become the last sub-menu of the menu, a new menu will be become the last menu in the toolbar, and so on).

A position of `0` will insert the item before all the others.

If you already have an object, you can use that as a reference too. For example:

```
def populate(self):

    link = self.toolbar.add_link_item('Link', url=link_url)
    self.toolbar.add_button('Button', url=button_url, position=link)
```

will add the new button before the link item.

Finally, you can use a *`ItemSearchResult`* as a position:

```
def populate(self):

    self.toolbar.add_link_item('Link', url=link_url)

    link = self.toolbar.find_first(LinkItem)

    self.toolbar.add_button('Button', url=button_url, position=link)
```

and since the `ItemSearchResult` can be cast to an integer, you could even do:

self.toolbar.add_button('Button', url=button_url, position=link+1)

Control how and when the toolbar appears

By default, your *CMSToolbar* sub-class will be active (i.e. its `populate` methods will be called) in the toolbar on every page, when the user `is_staff`. Sometimes however a `CMSToolbar` sub-class should only populate the toolbar when visiting pages associated with a particular application.

A `CMSToolbar` sub-class has a useful attribute that can help determine whether a toolbar should be activated. `is_current_app` is `True` when the application containing the toolbar class matches the application handling the request.

This allows you to activate it selectively, for example:

```
def populate(self):

    if not self.is_current_app:
        return

    [...]
```

If your toolbar class is in another application than the one you want it to be active for, you can list any applications it should support when you create the class:

```
supported_apps = ['some_app']
```

`supported_apps` is a tuple of application dotted paths (e.g: `supported_apps = ('whatever.path.app', 'another.path.app')`).

The attribute `app_path` will contain the name of the application handling the current request - if `app_path` is in `supported_apps`, then `is_current_app` will be `True`.

Modifying an existing toolbar

If you need to modify an existing toolbar (say to change an attribute or the behaviour of a method) you can do this by creating a sub-class of it that implements the required changes, and registering that instead of the original.

The original can be unregistered using `toolbar_pool.unregister()`, as in the example below. Alternatively if you originally invoked the toolbar class using *CMS_TOOLBARS*, you will need to modify that to refer to the new one instead.

An example, in which we unregister the original and register our own:

```
from cms.toolbar_pool import toolbar_pool
from third_party_app.cms_toolbar import ThirdPartyToolbar
```

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```
@toolbar_pool.register
class MyBarToolbar(ThirdPartyToolbar):
    [...]

toolbar_pool.unregister(ThirdPartyToolbar)
```

Detecting URL changes to an object

If you want to watch for object creation or editing of models and redirect after they have been added or changed add a `watch_models` attribute to your toolbar.

Example:

```
class PollToolbar(CMSToolbar):

    watch_models = [Poll]

    def populate(self):
        ...
```

After you add this every change to an instance of `Poll` via sideframe or modal window will trigger a redirect to the URL of the poll instance that was edited, according to the toolbar status:

- in *draft* mode the `get_draft_url()` is returned (or `get_absolute_url()` if the former does not exist)
- in *live* mode, and the method exists, `get_public_url()` is returned.

Frontend

If you need to interact with the toolbar, or otherwise account for it in your site's frontend code, it provides CSS and JavaScript hooks for you to use.

It will add various classes to the page's `<html>` element:

- `cms-ready`, when the toolbar is ready
- `cms-toolbar-expanded`, when the toolbar is fully expanded
- `cms-toolbar-expanding` and `cms-toolbar-collapsing` during toolbar animation.

The toolbar also fires a JavaScript event called `cms-ready` on the document. You can listen to this event using jQuery:

```
CMS.$(document).on('cms-ready', function () { ... });
```

How to customise navigation menus

In this document we discuss three different way of customising the navigation menus of django CMS sites.

1. *Menus*: Statically extend the menu entries
2. *Attach Menus*: Attach your menu to a page.
3. *Navigation Modifiers*: Modify the whole menu tree

Menus

Create a `cms_menus.py` in your application, with the following:

```
from menus.base import Menu, NavigationNode
from menus.menu_pool import menu_pool
from django.utils.translation import gettext_lazy as _

class TestMenu(Menu):

    def get_nodes(self, request):
        nodes = []
        n = NavigationNode(_('sample root page'), "/", 1)
        n2 = NavigationNode(_('sample settings page'), "/bye/", 2)
        n3 = NavigationNode(_('sample account page'), "/hello/", 3)
        n4 = NavigationNode(_('sample my profile page'), "/hello/world/", 4, 3)
        nodes.append(n)
        nodes.append(n2)
        nodes.append(n3)
        nodes.append(n4)
        return nodes

menu_pool.register_menu(TestMenu)
```

Note: Up to version 3.1 this module was named `menu.py`. Please update your existing modules to the new naming convention. Support for the old name will be removed in version 3.5.

If you refresh a page you should now see the menu entries above. The `get_nodes` function should return a list of *`NavigationNode`* instances. A *`menus.base.NavigationNode`* takes the following arguments:

`title`
Text for the menu node

`url`
URL for the menu node link

`id`
A unique id for this menu

`parent_id=None`
If this is a child of another node, supply the id of the parent here.

`parent_namespace=None`
If the parent node is not from this menu you can give it the parent namespace. The namespace is the name of the class. In the above example that would be: `TestMenu`

attr=None
A dictionary of additional attributes you may want to use in a modifier or in the template

visible=True
Whether or not this menu item should be visible

Additionally, each *menus.base.NavigationNode* provides a number of methods which are detailed in the *NavigationNode* API references.

Customise menus at runtime

To adapt your menus according to request dependent conditions (say: anonymous/logged in user), you can use *Navigation Modifiers* or you can make use of existing ones.

For example it's possible to add `{'visible_for_anonymous': False}`/`{'visible_for_authenticated': False}` attributes recognised by the django CMS core `AuthVisibility` modifier.

Complete example:

```
class UserMenu(Menu):
    def get_nodes(self, request):
            return [
                NavigationNode(_("Profile"), reverse(profile), 1, attr={'visible_for_
↪anonymous': False}),
                NavigationNode(_("Log in"), reverse(login), 3, attr={'visible_for_
↪authenticated': False}),
                NavigationNode(_("Sign up"), reverse(logout), 4, attr={'visible_for_
↪authenticated': False}),
                NavigationNode(_("Log out"), reverse(logout), 2, attr={'visible_for_
↪anonymous': False}),
            ]
```

Attach Menus

Classes that extend from *menus.base.Menu* always get attached to the root. But if you want the menu to be attached to a CMS Page you can do that as well.

Instead of extending from *Menu* you need to extend from *cms.menu_bases.CMSAttachMenu* and you need to define a name.

We will do that with the example from above:

```
from menus.base import NavigationNode
from menus.menu_pool import menu_pool
from django.utils.translation import gettext_lazy as _
from cms.menu_bases import CMSAttachMenu

class TestMenu(CMSAttachMenu):

    name = _("test menu")

    def get_nodes(self, request):
        nodes = []
        n = NavigationNode(_('sample root page'), "/", 1)
```

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```
        n2 = NavigationNode(_('sample settings page'), "/bye/", 2)
        n3 = NavigationNode(_('sample account page'), "/hello/", 3)
        n4 = NavigationNode(_('sample my profile page'), "/hello/world/", 4, 3)
        nodes.append(n)
        nodes.append(n2)
        nodes.append(n3)
        nodes.append(n4)
        return nodes

menu_pool.register_menu(TestMenu)
```

Now you can link this Menu to a page in the *Advanced* tab of the page settings under attached menu.

Navigation Modifiers

Navigation Modifiers give your application access to navigation menus.

A modifier can change the properties of existing nodes or rearrange entire menus.

Example use-cases

A simple example: you have a news application that publishes pages independently of django CMS. However, you would like to integrate the application into the menu structure of your site, so that at appropriate places a *News* node appears in the navigation menu.

In another example, you might want a particular attribute of your `Pages` to be available in menu templates. In order to keep menu nodes lightweight (which can be important in a site with thousands of pages) they only contain the minimum attributes required to generate a usable menu.

In both cases, a Navigation Modifier is the solution - in the first case, to add a new node at the appropriate place, and in the second, to add a new attribute - on the `attr` attribute, rather than directly on the `NavigationNode`, to help avoid conflicts - to all nodes in the menu.

How it works

Place your modifiers in your application's `cms_menus.py`.

To make your modifier available, it then needs to be registered with `menus.menu_pool.menu_pool`.

Now, when a page is loaded and the menu generated, your modifier will be able to inspect and modify its nodes.

Here is an example of a simple modifier that places each Page's `changed_by` attribute in the corresponding `NavigationNode`:

```
from menus.base import Modifier
from menus.menu_pool import menu_pool

from cms.models import Page

class MyExampleModifier(Modifier):
    """
    This modifier makes the changed_by attribute of a page
```

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```
    accessible for the menu system.
    """
    def modify(self, request, nodes, namespace, root_id, post_cut, breadcrumb):
        # only do something when the menu has already been cut
        if post_cut:
            # only consider nodes that refer to cms pages
            # and put them in a dict for efficient access
            page_nodes = {n.id: n for n in nodes if n.attr["is_page"]}
            # retrieve the attributes of interest from the relevant pages
            pages = Page.objects.filter(id__in=page_nodes.keys()).values('id', 'changed_
↪by')
            # loop over all relevant pages
            for page in pages:
                # take the node referring to the page
                node = page_nodes[page['id']]
                # put the changed_by attribute on the node
                node.attr["changed_by"] = page['changed_by']
        return nodes

menu_pool.register_modifier(MyExampleModifier)
```

It has a method *modify()* that should return a list of *NavigationNode* instances. *modify()* should take the following arguments:

request
A Django request instance. You want to modify based on sessions, or user or permissions?

nodes
All the nodes. Normally you want to return them again.

namespace
A Menu Namespace. Only given if somebody requested a menu with only nodes from this namespace.

root_id
Was a menu request based on an ID?

post_cut
Every modifier is called two times. First on the whole tree. After that the tree gets cut to only show the nodes that are shown in the current menu. After the cut the modifiers are called again with the final tree. If this is the case `post_cut` is `True`.

breadcrumb
Is this a breadcrumb call rather than a menu call?

Here is an example of a built-in modifier that marks all node levels:

```
class Level(Modifier):
    """
    marks all node levels
    """
    post_cut = True

    def modify(self, request, nodes, namespace, root_id, post_cut, breadcrumb):
        if breadcrumb:
            return nodes
        for node in nodes:
```

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```
            if not node.parent:
                if post_cut:
                    node.menu_level = 0
                else:
                    node.level = 0
                self.mark_levels(node, post_cut)
        return nodes

    def mark_levels(self, node, post_cut):
        for child in node.children:
            if post_cut:
                child.menu_level = node.menu_level + 1
            else:
                child.level = node.level + 1
            self.mark_levels(child, post_cut)

menu_pool.register_modifier(Level)
```

Performance issues in menu modifiers

Navigation modifiers can quickly become a performance bottleneck. Each modifier is called multiple times: For the breadcrumb (`breadcrumb=True`), for the whole menu tree (`post_cut=False`), for the menu tree cut to the visible part (`post_cut=True`) and perhaps for each level of the navigation. Performing inefficient operations inside a navigation modifier can hence lead to big performance issues. Some tips for keeping a modifier implementation fast:

- Specify when exactly the modifier is necessary (in breadcrumb, before or after cut).
- Only consider nodes and pages relevant for the modification.
- Perform as less database queries as possible (i.e. not in a loop).
- In database queries, fetch exactly the attributes you are interested in.
- If you have multiple modifications to do, try to apply them in the same method.

New in version 3.2.

How to implement content creation wizards

django CMS offers a framework for creating 'wizards' - helpers - for content editors.

They provide a simplified workflow for common tasks such as creating a new page.

A django CMS Page wizard already exists, but you can create your own for other content types very easily.

Create a content-creation wizard

Creating a CMS content creation wizard for your own module is fairly easy.

To begin, create a file in the root level of your module called `forms.py` to create your form(s):

```
# my_apps/forms.py

from django import forms

class MyAppWizardForm(forms.ModelForm):
    class Meta:
        model = MyApp
        exclude = []
```

Now create another file in the root level called `cms_wizards.py`. In this file, import `Wizard` as follows:

```
from cms.wizards.wizard_base import Wizard
```

Then, simply subclass `Wizard` and instantiate it.

Note: Registering a wizard with the wizard_pool is no longer the preferred way to register a wizard. Since django CMS version 4 django CMS keeps track of wizard using `cms_config.py`.

If you were to do this for `MyApp`, it might look like this:

```
# my_apps/cms_wizards.py

from cms.wizards.wizard_base import Wizard
from cms.wizards.wizard_pool import wizard_pool

from .forms import MyAppWizardForm

class MyAppWizard(Wizard):
    pass

my_app_wizard = MyAppWizard(
    title="New MyApp",
    weight=200,
    form=MyAppWizardForm,
    description="Create a new MyApp instance",
)

wizard_pool.register(my_app_wizard)
```

Note: If your model doesn't define a `get_absolute_url` function then your wizard will require a get_success_url method.

```
class MyAppWizard(Wizard):

    def get_success_url(self, obj, **kwargs):
        """
```

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```
        This should return the URL of the created object, «obj».
        """
        if 'language' in kwargs:
            with force_language(kwargs['language']):
                url = obj.get_absolute_url()
        else:
            url = obj.get_absolute_url()

        return url
```

That's it!

Note: The module name `cms_wizards` is special, in that any such-named modules in your project's Python path will automatically be loaded, triggering the registration of any wizards found in them. Wizards may be declared and registered in other modules, but they might not be automatically loaded.

The above example is using a `ModelForm`, but you can also use `forms.Form`. In this case, you **must** provide the model class as another keyword argument when you instantiate the Wizard object.

For example:

```
# my_apps/forms.py

from django import forms

class MyAppWizardForm(forms.Form):
    name = forms.CharField()


# my_apps/cms_wizards.py

from cms.wizards.wizard_base import Wizard
from cms.wizards.wizard_pool import wizard_pool

from .forms import MyAppWizardForm
from .models import MyApp

class MyAppWizard(Wizard):
    pass

my_app_wizard = MyAppWizard(
    title="New MyApp",
    weight=200,
    form=MyAppWizardForm,
    model=MyApp,
    description="Create a new MyApp instance",
)

wizard_pool.register(my_app_wizard)
```

You must subclass `cms.wizards.wizard_base.Wizard` to use it. This is because each wizard's uniqueness is de-

termined by its class and module name.

See the *Reference section on wizards* for technical details of the wizards API.

New in version 4.1.

How to create an admin class for a grouper model

What is a grouper model?

It's an reusable abstract structural pattern, that is in django CMS used to separate language independent and language specific content.

django CMS defines grouper-content structure for Page-PageContent as follows:

- The `Page` is the grouper model which represents base unit, that can have multiple content objects attached
- The `PageContent` is the content model which represents page content that can be different for its grouping field - `language` in our case. It also includes the placeholders for the frontend editor.

This mechanism ensures that language-independent properties of a page, such as position in the page tree or permissions, are collected at the grouper model while language-specific content is collected in the content model.

Note: This pattern is relevant for django CMS Versioning since it versions the content objects and not the grouper objects.

To this end, if you want to create models that should be versionable like the `PageContent` of a `Page` objects you need to define a grouper and a content model.

Extra grouping fields define fields of the content model by which they are grouped: `PageContent` uses `language` as an extra grouping field. This means that one `Page` object can have multiple `PageContent` objects assign to which differ in their language.

If not extra grouping fields are given each grouper object can have at most one content object assigmed to it.

The language field is a typical (but not necessary) extra grouping field.

Administrating grouper models

To simplify creation of grouper content models, django CMS provides support for both the model admin class of the grouper model and the change and add forms of the content model.

In this scenario you will register a model admin for the grouper model and it will provide the user with the ability to view, change and add content objects, too. You will not necessarily need to add a model admin class for the content model at all (with the possible exception of a redirecting stub to allow third party apps to reverse admin views for the content model, too, see below).

To create a model admin class for a grouper model put the following code in your *admin.py*:

```
from cms.admin.utils import GrouperModelAdmin


class MyGrouperAdmin(GrouperModelAdmin):
    # Declare content model
    content_model = MyContent
```

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```
    # Add language tabs to change and add views
    extra_grouping_fields = ("language",)
    # Add grouper and content fields to change list view
    # Add preview and settings action to change list view
    list_display = (
        "field_in_grouper_model",
        "content__field_in_content_model",
        "admin_list_actions",
    )
```

The property *content_model* defines which model is used as the content model. If you do not specify a *content_model*, django CMS will look for a model named like the grouper model but with "Content" appended. The default content model for `Post` would be `PostContent`.

The content model needs to have a foreign key pointing to the grouper model. The first foreign key found is assumed to be the field by which the content objects are assigned to their grouper objects. If you have multiple foreign keys to the grouper model, please specify *content_related_field*.

For this example there is only `language` as extra grouping field declared. You only have to proviude tuple of *extra_grouping_fields* if you have any.

Note: All fields serving as extra grouping fields must be part of the admin's fieldsets setting for *GrouperModelAdmin* to work properly. In the change form the fields will be invisible.

Change list view

For the list display *GrouperModelAdmin* provides additional fields from the content model: `content__{content_model_field_name}`. Those fields can be used in list_display just as grouper model fields and will automatically show the content of the currently selected grouping fields.

Finally, *GrouperModelAdmin* provides two action buttons for each entry in the change list view:

- to preview the content model in the frontend editor
- to change the settings (i.e., go to the change view of the grouper object)

These are for convenience and appear as soon as `admin_list_actions` is added to the `list_display` attribute.

Example

This is an example (taken from django CMS alias) on how a grouper admin might look like:

```
from cms.admin.utils import GrouperModelAdmin


@admin.register(Alias)
class AliasAdmin(GrouperModelAdmin):
    list_display = ["content__name", "category", "admin_list_actions"]
    list_display_links = None  # With action buttons a link is not needed
    list_filter = (
        SiteFilter,
        CategoryFilter,
```

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```
    )  # Custom filters
    fields = (
        "content__name",
        "category",
        "site",
        "content__language",
    )  # feeds into fieldsets
    readonly_fields = ("static_code",)
    form = AliasGrouperAdminForm  # Custom admin form
    extra_grouping_fields = ("language",)  # Language as grouping field
    EMPTY_CONTENT_VALUE = mark_safe(
        _("<i>Missing language</i>")
    )  # Label for missing content objects
```

Other extra grouping fields (besides language)

The standard templates of django CMS will work with `language` as an extra grouping field out of the box:

- It creates a dropdown to switch languages for the admin's change list view.
- It creates tabs to switch languages for the admin's change and add views.

To use other grouping fields you will have to do two things:

1. You will need to **supply templates** for the change list view and the change and add views that render corresponding dropdowns or other ways of selecting which content is currently being viewed.
2. You will need to **provide context** for the templates to render the valid choices.

Providing your own templates

To show a selector for your additional grouping field you need to overwrite both the `change_list_template` and `change_form_template`. Your templates can extend the default templates. Let's say you have "region" as an additional grouping field. For the **change list template** this might look like this:

```
{% extends "admin/cms/grouper/change_list.html" %}
{% block language_tabs %}
    {# Here goes the region mark-up #}
    {% if region_dropdown %}
        <div class="region-selector">
            ...
        </div>
    {% endif %}
    {{ block.super }}
{% endblock %}
```

For the **change form template** this might look like this:

```
{% extends "admin/cms/grouper/change_form.html" %}
{% block search %}
    {# Here goes the region mark-up #}
    {% if "region" in cl.model_admin.extra_grouping_fields %}
```

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```
        <div class="region-selector">
            ...
        </div>
    {% endif %}
    {{ block.super }}
{% endblock %}
```

Providing the required context

To provide the required context for your additional grouping model, you will have to implement two methods in your grouper model admin.

```
from cms.admin.utils import GrouperModelAdmin


class MyGrouperAdmin(GrouperModelAdmin):
    model = MyModel
    extra_grouping_fields = ("region",)

    ...

    def changelist_view(request, extra_context=None):
        """Extra context for changelist_view"""
        my_context = {...}  # Add context on region grouper
        return super().changelist_view(
            request, extra_context={**(extra_context or {}), **my_context}
        )

    def get_extra_context(self, request, obj_id=None):
        """Extra context for add_view and change_view"""
        my_context = {...}  # Add context on region grouper
        return {
            **super().get_extra_context(request, obj_id),
            **my_context,
        }
```

Consider that the context will require a set of values your additional grouping field can take. In the region example this might be `all_regions = {"americas": _("Americas"), "europe": _("Europe"), ...}`.

How to extend Page & PageContent models

You can extend the *cms.models.pagemodel.Page* and *cms.models.contentmodels.PageContent* models with your own fields (e.g. adding an icon for every page) by using the extension models: `cms.extensions.PageExtension` and `cms.extensions.PageContentExtension`, respectively.

Note: Changed in version 4.1: In django CMS the `PageContent` model used to be called `Title`. Since django CMS 4.1 a `TitleExtension` has become `PageContentExtension`

PageContent vs Page extensions

The difference between a **page extension** and a **page content extension** is related to the difference between the *cms.models.pagemodel.Page* and *cms.models.contentmodels.PageContent* models.

- `PageExtension`: use to add fields that should have **the same values** for the different language versions of a page - for example, an icon.
- `PageContentExtension`: use to add fields that should have **language-specific values** for different language versions of a page - for example, keywords.

Implement a basic extension

Three basic steps are required:

- add the extension *model*
- add the extension *admin*
- add a toolbar menu item for the extension

Page model extension example

The model

To add a field to the Page model, create a class that inherits from `cms.extensions.PageExtension`. Your class should live in one of your applications' `models.py` (or module).

Note: Since `PageExtension` (and `PageContentExtension`) inherit from `django.db.models.Model`, you are free to add any field you want but make sure you don't use a unique constraint on any of your added fields because uniqueness prevents the copy mechanism of the extension from working correctly. This means that you can't use one-to-one relations on the extension model.

Finally, you'll need to register the model using `extension_pool`.

Here's a simple example which adds an `icon` field to the page:

```
from django.db import models
from cms.extensions import PageExtension
from cms.extensions.extension_pool import extension_pool


class IconExtension(PageExtension):
    image = models.ImageField(upload_to='icons')


extension_pool.register(IconExtension)
```

Of course, you will need to make and run a migration for this new model.

The admin

To make your extension editable, you must first create an admin class that sub-classes `cms.extensions.PageExtensionAdmin`. This admin handles page permissions.

Continuing with the example model above, here's a simple corresponding `PageExtensionAdmin` class:

```
from django.contrib import admin
from cms.extensions import PageExtensionAdmin

from .models import IconExtension


class IconExtensionAdmin(PageExtensionAdmin):
    pass

admin.site.register(IconExtension, IconExtensionAdmin)
```

Since PageExtensionAdmin inherits from `ModelAdmin`, you'll be able to use the normal set of Django `ModelAdmin` properties appropriate to your needs.

Note: Note that the field that holds the relationship between the extension and a CMS Page is non-editable, so it does not appear directly in the Page admin views. This may be addressed in a future update, but in the meantime the toolbar provides access to it.

The toolbar item

You'll also want to make your model editable from the cms toolbar in order to associate each instance of the extension model with a page.

To add toolbar items for your extension create a file named `cms_toolbars.py` in one of your apps, and add the relevant menu entries for the extension on each page.

Here's a simple version for our example. This example adds a node to the existing *Page* menu, called *Page icon*. When selected, it will open a modal dialog in which the *Page icon* field can be edited.

```
from cms.toolbar_pool import toolbar_pool
from cms.extensions.toolbar import ExtensionToolbar
from django.utils.translation import gettext_lazy as _
from .models import IconExtension


@toolbar_pool.register
class IconExtensionToolbar(ExtensionToolbar):
    # defines the model for the current toolbar
    model = IconExtension

    def populate(self):
        # setup the extension toolbar with permissions and sanity checks
        current_page_menu = self._setup_extension_toolbar()

        # if it's all ok
```

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```
        if current_page_menu:
            # retrieves the instance of the current extension (if any) and the toolbar␣
↪item URL
            page_extension, url = self.get_page_extension_admin()
            if url:
                # adds a toolbar item in position 0 (at the top of the menu)
                current_page_menu.add_modal_item(_('Page Icon'), url=url,
                    disabled=not self.toolbar.edit_mode_active, position=0)
```

PageContent model extension example

In this example, we'll create a `Rating` extension field, that can be applied to each `PageContent`, in other words, to each language version of each `Page`.

Note: Please refer to the more detailed discussion above of the Page model extension example, and in particular to the special **notes**.

The model

```
from django.db import models
from cms.extensions import PageContentExtension
from cms.extensions.extension_pool import extension_pool


class RatingExtension(PageContentExtension):
    rating = models.IntegerField()


extension_pool.register(RatingExtension)
```

The admin

```
from django.contrib import admin
from cms.extensions import PageContentExtensionAdmin
from .models import RatingExtension


class RatingExtensionAdmin(PageContentExtensionAdmin):
    pass


admin.site.register(RatingExtension, RatingExtensionAdmin)
```

The toolbar item

In this example, we need to loop over the page contents for the page, and populate the menu with those.

```
from cms.toolbar_pool import toolbar_pool
from cms.extensions.toolbar import ExtensionToolbar
from django.utils.translation import gettext_lazy as _
from .models import RatingExtension
from cms.utils import get_language_list  # needed to get the page's languages
@toolbar_pool.register
class RatingExtensionToolbar(ExtensionToolbar):
    # defines the model for the current toolbar
    model = RatingExtension

    def populate(self):
        # setup the extension toolbar with permissions and sanity checks
        current_page_menu = self._setup_extension_toolbar()

        # if it's all ok
        if current_page_menu and self.toolbar.edit_mode_active:
            # create a sub menu labelled "Ratings" at position 1 in the menu
            sub_menu = self._get_sub_menu(
                current_page_menu, 'submenu_label', 'Ratings', position=1
                )

            # we now need to get the pagecontent_set (i.e. different language page␣
↪contents)
            # for this page
            page = self._get_page()
            page_contents = page.pagecontent_set(manager="admin_manager").latest_
↪content(language__in=get_language_list(page.node.site_id))

            # create a 3-tuple of (title_extension, url, title)
            nodes = [
                (*self.get_page_content_extension_admin(page_content), page_content.
↪title)
                for page_content in page_contents
            ]

            # cycle through the list of nodes
            for title_extension, url, title in nodes:

                # adds toolbar items
                sub_menu.add_modal_item(
                    'Rate %s' % title, url=url, disabled=not self.toolbar.edit_mode_
↪active
                    )
```

Using extensions

In templates

To access a page extension in page templates you can simply access the appropriate related_name field that is now available on the Page object.

Page extensions

As per the normal related_name naming mechanism, the appropriate field to access is the same as your `PageExtension` model name, but lowercased. Assuming your Page Extension model class is `IconExtension`, the relationship to the page extension model will be available on `page.iconextension`. From there you can access the extra fields you defined in your extension, so you can use something like:

```
{% load static %}

{# rest of template omitted ... #}

{% if request.current_page.iconextension %}
    <img src="{% static request.current_page.iconextension.image.url %}">
{% endif %}
```

where `request.current_page` is the normal way to access the current page that is rendering the template.

It is important to remember that unless the operator has already assigned a page extension to every page, a page may not have the `iconextension` relationship available, hence the use of the `{% if ... %}...{% endif %}` above.

PageContent extensions

In order to retrieve a page content extension within a template, get the `PageContent` object using `request.current_page.get_pagecontent_obj`. Using the example above, we could use:

```
{{ request.current_page.get_pagecontent_obj.ratingextension.rating }}
```

With menus

Like most other Page attributes, extensions are not represented in the menu `NavigationNodes`, and therefore menu templates will not have access to them by default.

In order to make the extension accessible, you'll need to create a *menu modifier* (see the example provided) that does this.

Each page extension instance has a one-to-one relationship with its page. Get the extension by using the reverse relation, along the lines of `extension = page.yourextensionlowercased`, and place this attribute of `page` on the node - as (for example) `node.extension`.

In the menu template the icon extension we created above would therefore be available as `child.extension.icon`.

Handling relations

If your `PageExtension` or `PageContentExtension` includes a ForeignKey *from* another model or includes a ManyToManyField, you should also override the method `copy_relations(self, oldinstance, language)` so that these fields are copied appropriately when the CMS makes a copy of your extension to support versioning, etc.

Here's an example that uses a `ManyToManyField`

```
from django.db import models
from cms.extensions import PageExtension
from cms.extensions.extension_pool import extension_pool


class MyPageExtension(PageExtension):

    page_categories = models.ManyToManyField(Category, blank=True)

    def copy_relations(self, oldinstance, language):
        for page_category in oldinstance.page_categories.all():
            page_category.pk = None
            page_category.mypageextension = self
            page_category.save()

extension_pool.register(MyPageExtension)
```

Complete toolbar API

The example above uses the *Simplified Toolbar API*.

If you need complete control over the layout of your extension toolbar items you can still use the low-level API to edit the toolbar according to your needs:

```
from cms.api import get_page_draft
from cms.toolbar_pool import toolbar_pool
from cms.toolbar_base import CMSToolbar
from cms.utils import get_cms_setting
from cms.utils.page_permissions import user_can_change_page
from django.urls import reverse, NoReverseMatch
from django.utils.translation import gettext_lazy as _
from .models import IconExtension


@toolbar_pool.register
class IconExtensionToolbar(CMSToolbar):
    def populate(self):
        # always use draft if we have a page
        self.page = get_page_draft(self.request.current_page)

        if not self.page:
            # Nothing to do
            return

        if user_can_change_page(user=self.request.user, page=self.page):
```

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```
            try:
                icon_extension = IconExtension.objects.get(extended_object_id=self.page.
↪id)
            except IconExtension.DoesNotExist:
                icon_extension = None
            try:
                if icon_extension:
                    url = reverse('admin:myapp_iconextension_change', args=(icon_
↪extension.pk,))
                else:
                    url = reverse('admin:myapp_iconextension_add') + '?extended_object=%s
↪' % self.page.pk
            except NoReverseMatch:
                # not in urls
                pass
            else:
                not_edit_mode = not self.toolbar.edit_mode_active
                current_page_menu = self.toolbar.get_or_create_menu('page')
                current_page_menu.add_modal_item(_('Page Icon'), url=url, disabled=not_
↪edit_mode)
```

Now when the operator invokes "Edit this page…" from the toolbar, there will be an additional menu item `Page Icon ...` (in this case), which can be used to open a modal dialog where the operator can affect the new `icon` field.

Note that when the extension is saved, the corresponding page is marked as having unpublished changes. To see the new extension values publish the page.

Simplified Toolbar API

The simplified Toolbar API works by deriving your toolbar class from `ExtensionToolbar` which provides the following API:

- `ExtensionToolbar.get_page_extension_admin()`: for page extensions, retrieves the correct admin URL for the related toolbar item; returns the extension instance (or `None` if none exists) and the admin URL for the toolbar item
- `ExtensionToolbar.get_page_content_extension_admin(page_content=None)`: for page content extensions, retrieves the correct admin URL for the related toolbar item; returns a tuple of the extension instance (or `None` if none exists) and the admin URL for the current page content (if the argument is None or omitted) or the page content object passed.

  Typically, `ExtensionToolbar.get_page_content_extension_admin` is used without the argument to modify the toolbar for the currently visible page content object.

Warning: The `ExtensionToolbar.get_title_extension_admin(language=None)` from django CMS versions before 4.1 still exists but is deprecated.

How to test your extensions

Testing Apps

Resolving View Names

Your apps need testing, but in your live site they aren't in `urls.py` as they are attached to a CMS page. So if you want to be able to use `reverse()` in your tests, or test templates that use the `url` template tag, you need to hook up your app to a special test version of `urls.py` and tell your tests to use that.

So you could create `myapp/tests/urls.py` with the following code:

```
from django.contrib import admin
from django.urls import re_path, include

urlpatterns = [
    re_path(r'^admin/', admin.site.urls),
    re_path(r'^myapp/', include('myapp.urls')),
    re_path(r'', include('cms.urls')),
]
```

And then in your tests you can plug this in with the `override_settings()` decorator:

```
from django.test.utils import override_settings
from cms.test_utils.testcases import CMSTestCase

class MyappTests(CMSTestCase):

    @override_settings(ROOT_URLCONF='myapp.tests.urls')
    def test_myapp_page(self):
        test_url = reverse('myapp_view_name')
        # rest of test as normal
```

If you want to the test url conf throughout your test class, then you can use apply the decorator to the whole class:

```
from django.test.utils import override_settings
from cms.test_utils.testcases import CMSTestCase

@override_settings(ROOT_URLCONF='myapp.tests.urls')
class MyappTests(CMSTestCase):

    def test_myapp_page(self):
        test_url = reverse('myapp_view_name')
        # rest of test as normal
```

CMSTestCase

Django CMS includes `CMSTestCase` which has various utility methods that might be useful for testing your CMS app and manipulating CMS pages.

Testing Plugins

To test plugins, you need to assign them to a placeholder. Depending on at what level you want to test your plugin, you can either check the HTML generated by it or the context provided to its template:

```
from django.test import TestCase
from django.test.client import RequestFactory

from cms.api import add_plugin
from cms.models import Placeholder
from cms.plugin_rendering import ContentRenderer

from myapp.cms_plugins import MyPlugin
from myapp.models import MyappPlugin

class MypluginTests(TestCase):
    def test_plugin_context(self):
        placeholder = Placeholder.objects.create(slot='test')
        model_instance = add_plugin(
            placeholder,
            MyPlugin,
            'en',
        )
        plugin_instance = model_instance.get_plugin_class_instance()
        context = plugin_instance.render({}, model_instance, None)
        self.assertIn('key', context)
        self.assertEqual(context['key'], 'value')

    def test_plugin_html(self):
        placeholder = Placeholder.objects.create(slot='test')
        model_instance = add_plugin(
            placeholder,
            MyPlugin,
            'en',
        )
        renderer = ContentRenderer(request=RequestFactory())
        html = renderer.render_plugin(model_instance, {})
        self.assertEqual(html, '<strong>Test</strong>')
```

Sharing functionality

How to share capabilities between apps

New in version 4.0.

To understand how to use the app registration system, lets use an example. Let's say our INSTALLED_APPS include these three apps:

```
INSTALLED_APPS = [
    ...
    'pink_cms_admin',
    'pony_cms_icons',
    'blog_posts',
]
```

The pink_cms_admin is an app that extends the cms by making apps, that are accordingly configured, to have a pink admin. To do that, it would define a pink_cms_admin/cms_config.py file, which would look like this:

```
from cms.app_base import CMSAppExtension

from pink_cms_admin import make_admin_pink


class PinkAdminCMSExtension(CMSAppExtension):

    def configure_app(self, cms_config):
        # Do anything you need to do to each app that wants to be pink
        make_admin_pink(cms_config)
```

The blog_posts app wants to be pink and wants to have pony icons everywhere. So it would define blog_posts/cms_config.py like this:

```
from cms.app_base import CMSAppConfig


class BlogPostsCMSConfig(CMSAppConfig):
    # To enable functionality define an attribute like <app_label>_enabled
    # and set it to True
    pink_cms_admin_enabled = True
    pony_cms_icons_enabled = True

    # pony_cms_icons also has additional settings. These are defined here.
    pony_cms_icons_pony_colours = ['purple', 'pink']
    pony_cms_icons_ponies_with_wings = True
```

The pony_cms_icons app lets other apps have pony icons everywhere, but also wants to have a pink admin. So it would define pony_cms_icons/cms_config.py like this:

```
from django.core.exceptions import ImproperlyConfigured

from cms.app_base import CMSAppConfig, CMSAppExtension

from pony_cms_icons import add_pony_icons
```

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```
class PonyIconsCMSConfig(CMSAppConfig):
    pink_cms_admin_enabled = True


class PonyIconsCMSExtension(CMSAppExtension):

    def configure_app(self, cms_config):
         # Do anything you need to do to each app that wants to have
         # pony icons here

         # As pony icons defines additional settings, you will also need to check
         # for any required settings here
         pony_colours = getattr(cms_config, 'pony_cms_icons_pony_colours', None)
         if not pony_colours:
             raise ImproperlyConfigured(
                 "Apps that use pony_cms_icons, must define pony_cms_icons_pony_colours")
         ponies_with_wings = getattr(cms_config, 'pony_cms_icons_ponies_with_wings',␣
↪False)

         add_pony_icons(cms_config.django_app, pony_colours, ponies_with_wings)
```

The *configure_app()* method, as is already apparent, takes one param - `cms_config`. `cms_config` is an instance of an app's *CMSAppConfig* class. In addition to that you can also access the django app object (as defined in the app's apps.py) by using `cms_config.app_config`. In this way you can access attributes that django provides (such as `label`, `verbose_name` etc.).

The *configure_app()* method is run once for every django cms app that declares a feature as enabled.

If an app asks for a feature of another app that is not installed this feature is simply ignored. This in turn implies that you cannot assume that the feature you request in a *CMSAppConfig* is also available. Therefore, make sure your app's code also runs without that feature or check if your providing app is present in your *CMSAppConfig* and raise an `ImproperlyConfigured` exception if it is missing.

5.2.4 Reference

Technical reference material.

Command Line Interface

You can invoke the django CMS command line interface using the `cms` Django command:

```
python manage.py cms
```

Informational commands

cms list

The `list` command is used to display information about your installation.

It has two sub-commands:

- `cms list plugins` lists all plugins that are used in your project.
- `cms list apphooks` lists all apphooks that are used in your project.

`cms list plugins` will issue warnings when it finds orphaned plugins (see `cms delete-orphaned-plugins` below).

cms check

Checks your configuration and environment.

Plugin and apphook management commands

cms delete-orphaned-plugins

> **Warning:** The `delete-orphaned-plugins` command **permanently deletes** data from your database. You should make a backup of your database before using it!

Identifies and deletes orphaned plugins.

Orphaned plugins are ones that exist in the CMSPlugins table, but:

- have a `plugin_type` that is no longer even installed
- have no corresponding saved instance in that particular plugin type's table

Such plugins will cause problems when trying to use operations that need to copy pages (and therefore plugins), which includes `cms moderator on` as well as page copy operations in the admin.

It is recommended to run `cms list plugins` periodically, and `cms delete-orphaned-plugins` when required.

cms uninstall

The `uninstall` subcommand can be used to make uninstalling a CMS plugin or an apphook easier.

It has two sub-commands:

- `cms uninstall plugins <plugin name> [<plugin name 2> [...]]` uninstalls one or several plugins by **removing** them from all pages where they are used. Note that the plugin name should be the name of the class that is registered in the django CMS. If you are unsure about the plugin name, use the *cms list* to see a list of installed plugins.
- `cms uninstall apphooks <apphook name> [<apphook name 2> [...]]` uninstalls one or several apphooks by **removing** them from all pages where they are used. Note that the apphook name should be the name of the class that is registered in the django CMS. If you are unsure about the apphook name, use the *cms list* to see a list of installed apphooks.

> **Warning:** The uninstall commands **permanently delete** data from your database. You should make a backup of your database before using them!

cms copy

The `copy` command is used to copy content from one language or site to another.

It has two sub-commands:

- `cms copy lang` copy content to a given language.
- `cms copy site` copy pages and content to a given site.

cms copy lang

The `copy lang` subcommand can be used to copy content (titles and plugins) from one language to another. By default the subcommand copy content from the current site (e.g. the value of `SITE_ID`) and only if the target placeholder has no content for the specified language; using the defined options you can change this.

You must provide two arguments:

- `--from-lang`: the language to copy the content from;
- `--to-lang`: the language to copy the content to.

It accepts the following options

- `--force`: set to copy content even if a placeholder already has content; if set, copied content will be appended to the original one;
- `--site`: specify a SITE_ID to operate on sites different from the current one;
- `--verbosity`: set for more verbose output.
- `--skip-content`: if set, content is not copied, and the command will only create titles in the given language.

Example:

```
cms copy lang --from-lang=en --to-lang=de --force --site=2 --verbosity=2
```

cms copy site

The `copy site` subcommand can be used to copy content (pages and plugins) from one site to another. The subcommand copy content from the `from-site` to `to-site`; please note that static placeholders are copied as they are shared across sites. The whole source tree is copied, in the root of the target website. Existing pages on the target website are not modified.

You must provide two arguments:

- `--from-site`: the site to copy the content from;
- `--to-site`: the site to copy the content to.

Example:

```
cms copy site --from-site=1 --to-site=2
```

Maintenance and repair

`fix-tree`

Occasionally, the page tree can become corrupted. Typical symptoms include problems when trying to copy or delete pages.

This command will fix small corruptions by rebuilding the tree.

New in version 4.0: Since django CMS Version 4 this command does not affect the plugin tree.

Configuring django CMS

django CMS has a number of settings to configure its behaviour. These should be available in your `settings.py` file.

The `INSTALLED_APPS` setting

The ordering of items in `INSTALLED_APPS` matters. Entries for applications with plugins should come *after* `cms`.

The `MIDDLEWARE` setting

`cms.middleware.utils.ApphookReloadMiddleware`

Adding `ApphookReloadMiddleware` to the `MIDDLEWARE` tuple will enable automatic server restarts when changes are made to apphook configurations. It should be placed as near to the top of the classes as possible.

Note: This has been tested and works in many production environments and deployment configurations, but we haven't been able to test it with all possible set-ups. Please file an issue if you discover one where it fails.

Custom User Requirements

When using a custom user model (i.e. the `AUTH_USER_MODEL` Django setting), there are a few requirements that must be met.

django CMS expects a user model with at minimum the following fields: `email`, `password`, `is_active`, `is_staff`, and `is_superuser`. Additionally, it should inherit from `AbstractBaseUser` and `PermissionsMixin` (or `AbstractUser`), and must define one field as the `USERNAME_FIELD` (see Django documentation for more details) and define a `get_full_name()` method.

The models must also be editable via Django's admin and have an admin class registered.

Additionally, the application in which the model is defined **must** be loaded before `cms` in `INSTALLED_APPS`.

Note: In most cases, it is better to create a `UserProfile` model with a one to one relationship to `auth.User` rather than creating a custom user model. Custom user models are only necessary if you intended to alter the default behaviour of the User model, not simply extend it.

Additionally, if you do intend to use a custom user model, it is generally advisable to do so only at the beginning of a project, before the database is created.

Required Settings

CMS_TEMPLATES

default
`()` (Not a valid setting!)

A list of templates you can select for a page.

Example:

```
CMS_TEMPLATES = (
    ('base.html', gettext('default')),
    ('2col.html', gettext('2 Column')),
    ('3col.html', gettext('3 Column')),
    ('extra.html', gettext('Some extra fancy template')),
)
```

Note: All templates defined in *CMS_TEMPLATES* **must** contain at least the `js` and `css` sekizai namespaces. For an example, see *Templates*.

Note: Alternatively you can use *CMS_TEMPLATES_DIR* to define a directory containing templates for django CMS.

Warning: django CMS requires some special templates to function correctly. These are provided within `cms/templates/cms`. You are strongly advised not to use `cms` as a directory name for your own project templates.

Basic Customisation

CMS_TEMPLATE_INHERITANCE

default
`True`

Enables the inheritance of templates from parent pages.

When enabled, pages' `Template` options will include a new default: *Inherit from the parent page* (unless the page is a root page).

CMS_TEMPLATES_DIR

default
`None`

Instead of explicitly providing a set of templates via *CMS_TEMPLATES* a directory can be provided using this configuration.

CMS_TEMPLATES_DIR can be set to the (absolute) path of the templates directory, or set to a dictionary with *SITE_ID: template path* items:

```
CMS_TEMPLATES_DIR: {
    1: '/absolute/path/for/site/1/',
    2: '/absolute/path/for/site/2/',
}
```

The provided directory is scanned and all templates in it are loaded as templates for django CMS.

Template loaded and their names can be customised using the templates dir as a python module, by creating a `__init__.py` file in the templates directory. The file contains a single `TEMPLATES` dictionary with the list of templates as keys and template names as values:::

```
from django.utils.translation import gettext_lazy as _
TEMPLATES = {
    'col_two.html': _('Two columns'),
    'col_three.html': _('Three columns'),
}
```

Being a normal python file, templates labels can be passed through gettext for translation.

Note: As templates are still loaded by the Django template loader, the given directory **must** be reachable by the template loading system. Currently **filesystem** and **app_directory** loader schemas are tested and supported.

CMS_PLACEHOLDER_CONF

default

`{}`

Used to configure placeholders. If not given, all plugins will be available in all placeholders.

Example:

```
CMS_PLACEHOLDER_CONF = {
    None: {
        "plugins": ['TextPlugin'],
        'excluded_plugins': ['InheritPlugin'],
    },
    'content': {
        'plugins': ['TextPlugin', 'PicturePlugin'],
        'text_only_plugins': ['LinkPlugin'],
        'extra_context': {"width":640},
        'name': gettext("Content"),
        'language_fallback': True,
        'default_plugins': [
            {
                'plugin_type': 'TextPlugin',
                'values': {
                    'body':'<p>Lorem ipsum dolor sit amet...</p>',
                },
            },
        ],
        'child_classes': {
            'TextPlugin': ['PicturePlugin', 'LinkPlugin'],
```

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```
        },
        'parent_classes': {
            'LinkPlugin': ['TextPlugin'],
        },
    },
    'right-column': {
        "plugins": ['TeaserPlugin', 'LinkPlugin'],
        "extra_context": {"width": 280},
        'name': gettext("Right Column"),
        'limits': {
            'global': 2,
            'TeaserPlugin': 1,
            'LinkPlugin': 1,
        },
        'plugin_modules': {
            'LinkPlugin': 'Extra',
        },
        'plugin_labels': {
            'LinkPlugin': 'Add a link',
        },
    },
    'base.html content': {
        "plugins": ['TextPlugin', 'PicturePlugin', 'TeaserPlugin'],
        'inherit': 'content',
    },
}
```

You can combine template names and placeholder names to define plugins in a granular fashion, as shown above with `base.html content`.

Configuration is retrieved in the following order:

1. CMS_PLACEHOLDER_CONF['template placeholder']
2. CMS_PLACEHOLDER_CONF['placeholder']
3. CMS_PLACEHOLDER_CONF['template']
4. CMS_PLACEHOLDER_CONF[None]

The first `CMS_PLACEHOLDER_CONF` key that matches for the required configuration attribute is used.

E.g: given the example above if the `plugins` configuration is retrieved for the `content` placeholder in a page using the `base.html` template, the value `['TextPlugin', 'PicturePlugin', 'TeaserPlugin']` will be returned as `'base.html content'` matches; if the same configuration is retrieved for the `content` placeholder in a page using `fullwidth.html` template, the returned value will be `['TextPlugin', 'PicturePlugin']`. If `plugins` configuration is retrieved for `sidebar_left` placeholder, `['TextPlugin']` from `CMS_PLACEHOLDER_CONF` key `None` will be returned.

`plugins`
A list of plugins that can be added to this placeholder. If not supplied, all plugins can be selected.

`text_only_plugins`
A list of additional plugins available only in the TextPlugin, these plugins can't be added directly to this placeholder.

`excluded_plugins`
A list of plugins that will not be added to the given placeholder; this takes precedence over `plugins` configu-

ration: if a plugin is present in both lists, it **will not** be available in the placeholder. This is basically a way to **blacklist** a plugin: even if registered, it will not be available in the placeholder. If set on the `None` (default) key, the plugins will not be available in any placeholder (except the `excluded_plugins` configuration is overridden in more specific `CMS_PLACEHOLDER_KEYS`.

extra_context
Extra context that plugins in this placeholder receive.

name
The name displayed in the Django admin. With the gettext stub, the name can be internationalised.

limits
Limit the number of plugins that can be placed inside this placeholder. Dictionary keys are plugin names and the values are their respective limits. Special case: `global` - Limit the absolute number of plugins in this placeholder regardless of type (takes precedence over the type-specific limits).

language_fallback
When `True`, if the placeholder has no plugin for the current language it falls back to the fallback languages as specified in *CMS_LANGUAGES*. Defaults to `True` since version 3.1.

default_plugins
You can specify the list of default plugins which will be automatically added when the placeholder will be created (or rendered). Each element of the list is a dictionary with following keys :

plugin_type
The plugin type to add to the placeholder Example : `TextPlugin`

values
Dictionary to use for the plugin creation. It depends on the `plugin_type`. See the documentation of each plugin type to see which parameters are required and available. Example for a text plugin: `{'body':'<p>Lorem ipsum</p>'}` Example for a link plugin: `{'name':'Django-CMS', 'url':'https://www.django-cms.org'}`

children
It is a list of dictionaries to configure default plugins to add as children for the current plugin (it must accepts children). Each dictionary accepts same args than dictionaries of `default_plugins` : `plugin_type`, `values`, `children` (yes, it is recursive).

Complete example of default_plugins usage:

```
CMS_PLACEHOLDER_CONF = {
    'content': {
        'name' : _('Content'),
        'plugins': ['TextPlugin', 'LinkPlugin'],
        'default_plugins':[
            {
                'plugin_type':'TextPlugin',
                'values':{
                    'body':'<p>Great websites : %(_tag_child_1)s and %(_tag_child_
↪2)s</p>'
                },
                'children':[
                    {
                        'plugin_type':'LinkPlugin',
                        'values':{
                            'name':'django',
                            'url':'https://www.djangoproject.com/'
                        },
```

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```
                    },
                    {
                        'plugin_type':'LinkPlugin',
                        'values':{
                            'name':'django-cms',
                            'url':'https://www.django-cms.org'
                        },
                        # If using LinkPlugin from djangocms-link which
                        # accepts children, you could add some grandchildren :
                        # 'children' : [
                        #     ...
                        # ]
                    },
                ]
            },
        ]
    }
}
```

plugin_modules
A dictionary of plugins and custom module names to group plugin in the toolbar UI.

plugin_labels
A dictionary of plugins and custom labels to show in the toolbar UI.

child_classes
A dictionary of plugin names with lists describing which plugins may be placed inside each plugin. If not supplied, all plugins can be selected.

parent_classes
A dictionary of plugin names with lists describing which plugins may contain each plugin. If not supplied, all plugins can be selected.

require_parent
A Boolean indication whether that plugin requires another plugin as parent or not.

inherit
Placeholder name or template name + placeholder name which inherit. In the example, the configuration for `base.html content` inherits from `content` and just overwrites the `plugins` setting to allow `TeaserPlugin`, thus you have not to duplicate the configuration of `content`.

CMS_PLUGIN_CONTEXT_PROCESSORS

default
`[]`

A list of plugin context processors. Plugin context processors are callables that modify all plugins' context *before* rendering. See /how_to/10-custom_plugins for more information.

CMS_PLUGIN_PROCESSORS

default
`[]`

A list of plugin processors. Plugin processors are callables that modify all plugins' output *after* rendering. See /how_to/10-custom_plugins for more information.

CMS_APPHOOKS

default:
`()`

A list of import paths for *`cms.app_base.CMSApp`* sub-classes.

By default, apphooks are auto-discovered in applications listed in all `INSTALLED_APPS`, by trying to import their `cms_app` module.

When `CMS_APPHOOKS` is set, auto-discovery is disabled.

Example:

```
CMS_APPHOOKS = (
    'myapp.cms_app.MyApp',
    'otherapp.cms_app.MyFancyApp',
    'sampleapp.cms_app.SampleApp',
)
```

Internationalisation and localisation (I18N and L10N)

CMS_LANGUAGES

default
Value of `LANGUAGES` converted to this format

Defines the languages available in django CMS.

Example:

```
CMS_LANGUAGES = {
    1: [
        {
            'code': 'en',
            'name': gettext('English'),
            'fallbacks': ['de', 'fr'],
            'public': True,
            'hide_untranslated': True,
            'redirect_on_fallback': False,
        },
        {
            'code': 'de',
            'name': gettext('Deutsch'),
            'fallbacks': ['en', 'fr'],
            'public': True,
```

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```
        },
        {
            'code': 'fr',
            'name': gettext('French'),
            'public': False,
        },
    ],
    2: [
        {
            'code': 'nl',
            'name': gettext('Dutch'),
            'public': True,
            'fallbacks': ['en'],
        },
    ],
    'default': {
        'fallbacks': ['en', 'de', 'fr'],
        'redirect_on_fallback': True,
        'public': True,
        'hide_untranslated': False,
    }
}
```

Note: Make sure you only define languages which are also in `LANGUAGES`.

Warning: Make sure you use **language codes** (*en-us*) and not **locale names** (*en_US*) here and in `LANGUAGES`. Use *check command* to check for correct syntax.

`CMS_LANGUAGES` has different options where you can define how different languages behave, with granular control.

On the first level you can set values for each `SITE_ID`. In the example above we define two sites. The first site has 3 languages (English, German and French) and the second site has only Dutch.

The `default` node defines default behaviour for all languages. You can overwrite the default settings with language-specific properties. For example we define `hide_untranslated` as `False` globally, but the English language overwrites this behaviour.

Every language node needs at least a `code` and a `name` property. `code` is the ISO 2 code for the language, and `name` is the verbose name of the language.

Note: With a `gettext()` lambda function you can make language names translatable. To enable this add `gettext = lambda s: s` at the beginning of your settings file.

What are the properties a language node can have?

code

String. RFC5646 code of the language.

example
`"en"`.

Note: Is required for every language.

name

String. The verbose name of the language.

Note: Is required for every language.

public

Determines whether this language is accessible in the frontend. You may want for example to keep a language private until your content has been fully translated.

type
Boolean

default
`True`

fallbacks

A list of alternative languages, in order of preference, that are to be used if a page is not translated yet..

example
`['de', 'fr']`

default
`[]`

hide_untranslated

Hides untranslated pages in menus.

When applied to the `default` directive, if `False`, all pages in menus will be listed in all languages, including those that don't yet have content in a particular language. If `True`, untranslated pages will be hidden.

When applied to a particular language, hides that language's pages in menus until translations exist for them.

type
Boolean

default
`True`

redirect_on_fallback

Determines behaviour when the preferred language is not available. If `True`, will redirect to the URL of the same page in the fallback language. If `False`, the content will be displayed in the fallback language, but there will be no redirect.

Note that this applies to the fallback behaviour of *pages*. Starting for 3.1 *placeholders* **will** default to the same behaviour. If you do not want a placeholder to follow a page's fallback behaviour, you must set its `language_fallback` to `False` in *CMS_PLACEHOLDER_CONF*, above.

type
Boolean

default
`True`

Unicode support for automated slugs

If your site has languages which use non-ASCII character sets, *CMS_UNIHANDECODE_HOST* and *CMS_UNIHANDECODE_VERSION* will allow it to automate slug generation for those languages too.

Support for this is provided by the unihandecode.js project.

CMS_UNIHANDECODE_HOST

default
`None`

Must be set to the URL where you host your unihandecode.js files. For licensing reasons, django CMS does not include unihandecode.js.

If set to `None`, the default, unihandecode.js is not used.

Note: Unihandecode.js is a rather large library, especially when loading support for Japanese. It is therefore very important that you serve it from a server that supports gzip compression. Further, make sure that those files can be cached by the browser for a very long period.

CMS_UNIHANDECODE_VERSION

default
`None`

Must be set to the version number (eg `'1.0.0'`) you want to use. Together with *CMS_UNIHANDECODE_HOST* this setting is used to build the full URLs for the javascript files. URLs are built like this: `<CMS_UNIHANDECODE_HOST>-<CMS_UNIHANDECODE_VERSION>.<DECODER>.min.js`.

CMS_UNIHANDECODE_DECODERS

default
`['ja', 'zh', 'vn', 'kr', 'diacritic']`

If you add additional decoders to your *CMS_UNIHANDECODE_HOST*, you can add them to this setting.

CMS_UNIHANDECODE_DEFAULT_DECODER

default
`'diacritic'`

The default decoder to use when unihandecode.js support is enabled, but the current language does not provide a specific decoder in *CMS_UNIHANDECODE_DECODERS*. If set to `None`, failing to find a specific decoder will disable unihandecode.js for this language.

Example

Add these to your project's settings:

```
CMS_UNIHANDECODE_HOST = '/static/unihandecode/'
CMS_UNIHANDECODE_VERSION = '1.0.0'
CMS_UNIHANDECODE_DECODERS = ['ja', 'zh', 'vn', 'kr', 'diacritic']
```

Add the library files from GitHub ojii/unihandecode.js tree/dist to your static folder:

```
project/
    static/
        unihandecode/
            unihandecode-1.0.0.core.min.js
            unihandecode-1.0.0.diacritic.min.js
            unihandecode-1.0.0.ja.min.js
            unihandecode-1.0.0.kr.min.js
            unihandecode-1.0.0.vn.min.js
            unihandecode-1.0.0.zh.min.js
```

More documentation is available on unihandecode.js' Read the Docs.

Media Settings

CMS_MEDIA_PATH

default
`cms/`

The path from `MEDIA_ROOT` to the media files located in `cms/media/`

CMS_MEDIA_ROOT

default
`MEDIA_ROOT` + *CMS_MEDIA_PATH*

The path to the media root of the cms media files.

CMS_MEDIA_URL

default
`MEDIA_URL` + *CMS_MEDIA_PATH*

The location of the media files that are located in `cms/media/cms/`

CMS_PAGE_MEDIA_PATH

default
`'cms_page_media/'`

By default, django CMS creates a folder called `cms_page_media` in your static files folder where all uploaded media files are stored. The media files are stored in sub-folders numbered with the id of the page.

You need to ensure that the directory to which it points is writeable by the user under which Django will be running.

Advanced Settings

CMS_INTERNAL_IPS

default
`[]`

By default `CMS_INTERNAL_IPS` is an empty list (`[]`).

If left as an empty list, this setting does not add any restrictions to the toolbar. However, if set, the toolbar will only appear for client IP addresses that are in this list.

This setting may also be set to an *IpRangeList* from the external package `iptools`. This package allows convenient syntax for defining complex IP address ranges.

The client IP address is obtained via the *CMS_REQUEST_IP_RESOLVER* in the `cms.middleware.toolbar.ToolbarMiddleware` middleware.

CMS_REQUEST_IP_RESOLVER

default
'*cms.utils.request_ip_resolvers.default_request_ip_resolver*'

This setting is used system-wide to provide a consistent and plug-able means of extracting a client IP address from the HTTP request. The default implementation should work for most project architectures, but if not, the administrator can provide their own method to handle the project's specific circumstances.

The supplied method should accept a single argument *request* and return an IP address String.

CMS_PERMISSION

default
`False`

When enabled, 3 new models are provided in Admin:

- Pages global permissions
- User groups - page
- Users - page

In the edit-view of the pages you can now assign users to pages and grant them permissions. In the global permissions you can set the permissions for users globally.

If a user has the right to create new users he can now do so in the "Users - page", but he will only see the users he created. The users he created can also only inherit the rights he has. So if he only has been granted the right to edit a certain page all users he creates can, in turn, only edit this page. Naturally he can limit the rights of the users he creates even further, allowing them to see only a subset of the pages to which he is allowed access.

CMS_RAW_ID_USERS

default
`False`

This setting only applies if *CMS_PERMISSION* is `True`

The `view restrictions` and `page permissions` inlines on the `cms.models.Page` admin change forms can cause performance problems where there are many thousands of users being put into simple select boxes. If set to a positive integer, this setting forces the inlines on that page to use standard Django admin raw ID widgets rather than select boxes if the number of users in the system is greater than that number, dramatically improving performance.

Note: Using raw ID fields in combination with `limit_choices_to` causes errors due to excessively long URLs if you have many thousands of users (the PKs are all included in the URL of the popup window). For this reason, we only apply this limit if the number of users is relatively small (fewer than 500). If the number of users we need to limit to is greater than that, we use the usual input field instead unless the user is a CMS superuser, in which case we bypass the limit. Unfortunately, this means that non-superusers won't see any benefit from this setting.

Changed in version 3.2.1:: CMS_RAW_ID_USERS also applies to `GlobalPagePermission` admin.

CMS_PUBLIC_FOR

default
`all`

Determines whether pages without any view restrictions are public by default or staff only. Possible values are `all` and `staff`.

CMS_CACHE_DURATIONS

This dictionary carries the various cache duration settings.

'content'

default
`60`

Cache expiration (in seconds) for *show_placeholder*, *page_url*, *placeholder* and *static_placeholder* template tags.

Note: This settings was previously called `CMS_CONTENT_CACHE_DURATION`

'menus'

default
`3600`

Cache expiration (in seconds) for the menu tree.

Note: This settings was previously called `MENU_CACHE_DURATION`

'permissions'

default
`3600`

Cache expiration (in seconds) for view and other permissions.

CMS_CACHE_PREFIX

default
`cms-`

The CMS will prepend the value associated with this key to every cache access (set and get). This is useful when you have several django CMS installations, and you don't want them to share cache objects.

Example:

```
CMS_CACHE_PREFIX = 'mysite-live'
```

Note: Django 1.3 introduced a site-wide cache key prefix. See Django's own docs on cache key prefixing

CMS_PAGE_CACHE

default
`True`

Should the output of pages be cached? Takes the language, and time zone into account. Pages for logged in users are not cached. If the toolbar is visible the page is not cached as well.

CMS_PLACEHOLDER_CACHE

default
`True`

Should the output of the various placeholder template tags be cached? Takes the current language and time zone into account. If the toolbar is in edit mode or a plugin with `cache=False` is present the placeholders will not be cached.

CMS_PLUGIN_CACHE

default
`True`

Default value of the `cache` attribute of plugins. Should plugins be cached by default if not set explicitly?

> **Warning:** If you disable the plugin cache be sure to restart the server and clear the cache afterwards.

CMS_TOOLBARS

default
`None`

If defined, specifies the list of toolbar modifiers to be used to populate the toolbar, as import paths. Otherwise, all available toolbars from both the CMS and the third-party apps will be loaded.

Example:

```
CMS_TOOLBARS = [
    # CMS Toolbars
    'cms.cms_toolbars.PlaceholderToolbar',
    'cms.cms_toolbars.BasicToolbar',
    'cms.cms_toolbars.PageToolbar',

    # third-party Toolbar
    'aldryn_blog.cms_toolbars.BlogToolbar',
]
```

CMS_TOOLBAR_ANONYMOUS_ON

default
`True`

This setting controls if anonymous users can see the CMS toolbar with a login form when `?toolbar_on` is appended to a URL. The default behaviour is to show the toolbar to anonymous users.

CMS_TOOLBAR_URL__ENABLE

default
`"toolbar_on`

This setting controls how users can activate the CMS toolbar by appending a query string to the url. The default setting lets `?toolbar_on` activate the toolbar.

Note: This replaces the `?edit` query string of django CMS 3.x

CMS_TOOLBAR_URL__DISABLE

default
`"toolbar_off`

This setting controls how users can deactivate the CMS toolbar by appending a query string to the url. The default setting lets `?toolbar_off` deactivate the toolbar.

CMS_TOOLBAR_HIDE

default
`False`

By default, the django CMS toolbar is displayed to logged-in admin users on all pages that use the `{% cms_toolbar %}` template tag. Its appearance can be optionally restricted to django CMS pages only (technically, pages that are rendered by a django CMS view).

When this is set to `True`, all other pages will no longer display the toolbar. This includes pages with apphooks applied to them, as they are handled by the other application's views, and not django CMS's.

CMS_DEFAULT_X_FRAME_OPTIONS

default
`constants.X_FRAME_OPTIONS_INHERIT`

This setting is the default value for a Page's X Frame Options setting. This should be an integer preferably taken from the `cms.constants` e.g.

- X_FRAME_OPTIONS_INHERIT
- X_FRAME_OPTIONS_ALLOW
- X_FRAME_OPTIONS_SAMEORIGIN
- X_FRAME_OPTIONS_DENY

CMS_PAGE_WIZARD_DEFAULT_TEMPLATE

default
`TEMPLATE_INHERITANCE_MAGIC`

This is the path of the template used to create pages in the wizard. It must be one of the templates in *CMS_TEMPLATES*.

CMS_PAGE_WIZARD_CONTENT_PLACEHOLDER

default
None

When set to an editable, non-static placeholder that is available on the page template, the CMS page wizards will target the specified placeholder when adding any content supplied in the wizards' "Content" field. If this is left unset, then the content will target the first suitable placeholder found on the page's template.

CMS_PAGE_WIZARD_CONTENT_PLUGIN

default
`TextPlugin`

This is the name of the plugin created in the Page Wizard when the "Content" field is filled in. There should be no need to change it, unless you **don't** use `djangocms-text-ckeditor` in your project.

CMS_PAGE_WIZARD_CONTENT_PLUGIN_BODY

default
`body`

This is the name of the body field in the plugin created in the Page Wizard when the "Content" field is filled in. There should be no need to change it, unless you **don't** use `djangocms-text-ckeditor` in your project **and** your custom plugin defined in *CMS_PAGE_WIZARD_CONTENT_PLUGIN* have a body field **different** than `body`.

CMS_ENDPOINT_LIVE_URL_QUERYSTRING_PARAM_ENABLED

default
`False`

New in version 4.0: Setting to enable the appending of a PageContents live url to its preview and edit endpoints as a querystring parameter. This is disabled by default.

CMS_ENDPOINT_LIVE_URL_QUERYSTRING_PARAM

default
`live-url`

New in version 4.0: Setting to configure the query string parameter name used for the live-url of a PageContent edit/preview endpoint.

CMS_REDIRECT_PRESERVE_QUERY_PARAMS

default
`False`

This indicates to the CMS that redirects should preserve the query parameters.

CMS_REDIRECT_TO_LOWERCASE_SLUG

default
`False`

This indicates to the CMS that it should redirect requests with an non-lowercase slug to its lowercase version if no page with that slug is found.

CMS_CONFIRM_VERSION4

default
`False`

New in version 4.1: This setting **has to be set** to `True` for your project to run on django CMS version 4.1 or later.

The reason is that accidentally running a migration command on an existing installation of django CMS v3.x **may corrupt the database**. Upgrading from version 3.x to 4.x is not an automatic process.

API References

cms.api

Python APIs for creating CMS content. This is done in *cms.api* and not on the models and managers, because the direct API via models and managers is slightly counterintuitive for developers. Also the functions defined in this module do sanity checks on arguments.

> **Warning:** None of the functions in this module does any security or permission checks. They verify their input values to be sane wherever possible, however permission checks should be implemented manually before calling any of these functions.

Note: Due to potential circular dependency issues, it's recommended to import the api in the functions that uses its function.

e.g. use:

```
def my_function():
    from cms.api import api_function
    api_function(...)
```

instead of:

```
from cms.api import api_function

def my_function():
    api_function(...)
```

Functions and constants

cms.api.**create_page**(*title*, *template*, *language*, *menu_title=None*, *slug=None*, *apphook=None*, *apphook_namespace=None*, *redirect=None*, *meta_description=None*, *created_by='python-api'*, *parent=None*, *publication_date=None*, *publication_end_date=None*, *in_navigation=False*, *soft_root=False*, *reverse_id=None*, *navigation_extenders=None*, *published=None*, *site=None*, *login_required=False*, *limit_visibility_in_menu=None*, *position='last-child'*, *overwrite_url=None*, *xframe_options=0*)

Creates a `cms.models.Page` instance and returns it. Also creates a `cms.models.Title` instance for the specified language.

> **Warning:** Since version 4 the parameters published, publication_date, and publication_end_date do not change the behaviour of this function. If they are supplied a warning is raised.

Parameters

- **title** (*str*) – Title of the page
- **template** (*str*) – Template to use for this page. Must be in *CMS_TEMPLATES*
- **language** (*str*) – Language code for this page. Must be in `LANGUAGES`
- **menu_title** (*str*) – Menu title for this page
- **slug** (*str*) – Slug for the page, by default uses a slugified version of *title*
- **apphook** (str or *cms.app_base.CMSApp* sub-class) – Application to hook on this page, must be a valid apphook
- **apphook_namespace** (*str*) – Name of the apphook namespace
- **redirect** (*str*) – URL redirect
- **meta_description** (*str*) – Description of this page for SEO
- **created_by** (str of `django.contrib.auth.models.User` instance) – User that is creating this page
- **parent** (`cms.models.Page` instance) – Parent page of this page
- **in_navigation** (*bool*) – Whether this page should be in the navigation or not
- **soft_root** (*bool*) – Whether this page is a soft root or not
- **reverse_id** (*str*) – Reverse ID of this page (for template tags)
- **navigation_extenders** (*str*) – Menu to attach to this page. Must be a valid menu
- **site** (`django.contrib.sites.models.Site` instance) – Site to put this page on
- **login_required** (*bool*) – Whether users must be logged in or not to view this page

- **limit_visibility_in_menu** (VISIBILITY_ALL or VISIBILITY_USERS or VISIBILITY_ANONYMOUS) – Limits visibility of this page in the menu
- **position** (*str*) – Where to insert this node if *parent* is given, must be `'first-child'` or `'last-child'`
- **overwrite_url** (*str*) – Overwritten path for this page
- **xframe_options** (*int*) – X Frame Option value for Clickjacking protection
- **page_title** (*str*) – Overridden page title for HTML title tag

`cms.api.create_page_content`(*language*, *title*, *page*, *menu_title=None*, *slug=None*, *redirect=None*, *meta_description=None*, *parent=None*, *overwrite_url=None*, *page_title=None*, *path=None*, *created_by='python-api'*, *soft_root=False*, *in_navigation=False*, *template='INHERIT'*, *limit_visibility_in_menu=None*, *xframe_options=0*)

Creates a `cms.models.PageContent` instance and returns it.

`parent` is only used if slug=None.

Parameters

- **language** (*str*) – Language code for this page. Must be in `LANGUAGES`
- **title** (*str*) – Title of the page
- **page** (`cms.models.Page` instance) – The page for which to create this title
- **menu_title** (*str*) – Menu title for this page
- **slug** (*str*) – Slug for the page, by default uses a slugified version of *title*
- **redirect** (*str*) – URL redirect
- **meta_description** (*str*) – Description of this page for SEO
- **parent** (`cms.models.Page` instance) – Used for automated slug generation
- **overwrite_url** (*str*) – Overwritten path for this page
- **page_title** (*str*) – Overridden page title for HTML title tag

`cms.api.create_title`(*language*, *title*, *page*, *menu_title=None*, *slug=None*, *redirect=None*, *meta_description=None*, *parent=None*, *overwrite_url=None*, *page_title=None*, *path=None*, *created_by='python-api'*, *soft_root=False*, *in_navigation=False*, *template='INHERIT'*, *limit_visibility_in_menu=None*, *xframe_options=0*)

> **Warning:** `create_title` has been renamed to `create_page_content` as of django CMS version 4.

`cms.api.add_plugin`(*placeholder*, *plugin_type*, *language*, *position='last-child'*, *target=None*, ***data*)

Adds a plugin to a placeholder and returns it.

Parameters

- **placeholder** (*cms.models.placeholdermodel.Placeholder* instance) – Placeholder to add the plugin to
- **plugin_type** (str or *cms.plugin_base.CMSPluginBase* sub-class, must be a valid plugin) – What type of plugin to add
- **language** (*str*) – Language code for this plugin, must be in `LANGUAGES`

- **position** (*str*) – Position to add this plugin to the placeholder. Allowed positions are `"last-child"` (default), `"first-child"`, `"left"`, `"right"`.
- **target** – Parent plugin. Must be plugin instance
- **data** – Data for the plugin type instance

`cms.api.`**`create_page_user`**(*created_by*, *user*, *can_add_page=True*, *can_view_page=True*, *can_change_page=True*, *can_delete_page=True*, *can_recover_page=True*, *can_add_pageuser=True*, *can_change_pageuser=True*, *can_delete_pageuser=True*, *can_add_pagepermission=True*, *can_change_pagepermission=True*, *can_delete_pagepermission=True*, *grant_all=False*)

Creates a page user for the user provided and returns that page user.

Parameters

- **created_by** (`django.contrib.auth.models.User` instance) – The user that creates the page user
- **user** (`django.contrib.auth.models.User` instance) – The user to create the page user from
- **can_*** (*bool*) – Permissions to give the user
- **grant_all** (*bool*) – Grant all permissions to the user

`cms.api.`**`assign_user_to_page`**(*page*, *user*, *grant_on=5*, *can_add=False*, *can_change=False*, *can_delete=False*, *can_change_advanced_settings=False*, *can_publish=None*, *can_change_permissions=False*, *can_move_page=False*, *can_recover_page=True*, *can_view=False*, *grant_all=False*, *global_permission=False*)

Assigns a user to a page and gives them some permissions. Returns the `cms.models.PagePermission` object that gets created.

Parameters

- **page** (`cms.models.Page` instance) – The page to assign the user to
- **user** (`django.contrib.auth.models.User` instance) – The user to assign to the page
- **grant_on** (`cms.models.ACCESS_PAGE`, `cms.models.ACCESS_CHILDREN`,) – Controls which pages are affected

`cms.models.ACCESS_DESCENDANTS` or `cms.models.ACCESS_PAGE_AND_DESCENDANTS` :param can_*: Permissions to grant :param bool grant_all: Grant all permissions to the user

`cms.api.`**`publish_page`**(*page*, *user*, *language*)

> **Warning:** Publishing pages has been removed from django CMS core in version 4 onward.
>
> For publishing functionality see djangocms-versioning:

`cms.api.`**`publish_pages`**(*include_unpublished=False*, *language=None*, *site=None*)

> **Warning:** Publishing pages has been removed from django CMS core in version 4 onward.
>
> For publishing functionality see djangocms-versioning:

`cms.api.get_page_draft(page)`

> **Warning:** The concept of draft pages has been removed from django CMS core in version 4 onward.
>
> For draft functionality see djangocms-versioning:

`cms.api.copy_plugins_to_language(page, source_language, target_language, only_empty=True)`

Copy the plugins to another language in the same page for all the page placeholders.

By default, plugins are copied only if placeholder has no plugin for the target language; use `only_empty=False` to change this.

Parameters

- **page** (*cms.models.pagemodel.Page* instance) – the page to copy
- **source_language** (*string*) – The source language code, must be in `LANGUAGES`
- **target_language** (*string*) – The source language code, must be in `LANGUAGES`
- **only_empty** (*bool*) – if False, plugin are copied even if plugins exists in the target language (on a placeholder basis).

Return int

number of copied plugins

`cms.api.can_change_page(request)`

Check whether a user has the permission to change the page.

This will work across all permission-related setting, with a unified interface to permission checking.

Parameters

request (`HttpRequest` instance) – The request object from which the user will be taken.

Example workflows

Create a page called `'My Page` using the template `'my_template.html'` and add a text plugin with the content `'hello world'`. This is done in English:

```
from cms.api import create_page, add_plugin

page = create_page('My Page', 'my_template.html', 'en')
placeholder = page.placeholders.get(slot='body')
add_plugin(placeholder, 'TextPlugin', 'en', body='hello world')
```

cms.constants

`cms.constants.VISIBILITY_ALL = None`

Used for the `limit_visibility_in_menu` keyword argument to :func: *create_page*.Does not limit menu visibility.

`cms.constants.VISIBILITY_USERS = 1`

Used for the `limit_visibility_in_menu` keyword argument to :func: *create_page*. Limits menu visibility to authenticated users.

`cms.constants.VISIBILITY_ANONYMOUS = 2`

Used for the `limit_visibility_in_menu` keyword argument to :func: *create_page*. Limits menu visibility to anonymous(not authenticated) users.

`cms.constants.TEMPLATE_INHERITANCE_MAGIC = 'INHERIT'`

The token used to identify when a user selects "inherit" as template for a page.

`cms.constants.LEFT`

Used as a position indicator in the toolbar: On the left side.

`cms.constants.RIGHT`

Used as a position indicator in the toolbar: On the right side.

`cms.constants.EXPIRE_NOW = 0`

Used for cache control headers: 0 seconds, i.e. now.

`cms.constants.MAX_EXPIRATION_TTL = 31536000`

Used for cache control headers: 365 * 24 * 3600 seconds, i.e. one year. HTTP specification says max caching should only be up to one year.

Configuring apps to work with django CMS

App Hooks

class `cms.app_base.CMSApp`

Base class for creating apphooks. Apphooks live in a file called `cms_apps.py`. To create an AppHook subclass `CMSApp` in `cms_apps.py`

```
class MyAppHook(CMSApp):
    name = "Problem solver"
```

_urls

list of urlconfs: example: `_urls = ["myapp.urls"]`

_menus

list of menu classes: example: `_menus = [MyAppMenu]`

get_config(*namespace*)

Returns the apphook configuration instance linked to the given namespace

To be implemented by apphook subclass.

get_config_add_url()

Returns the url to add a new apphook configuration instance (usually the model admin add view)

To be implemented by apphook subclass.

get_configs()

Returns all the apphook configuration instances.

To be implemented by apphook subclass.

get_menus(*page=None*, *language=None*, ***kwargs*)

Returns the menus for the apphook instance, eventually selected according to the given arguments.

By default, it returns the menus assigned to *`CMSApp._menus`*.

The method accepts page, language and generic keyword arguments: you can customize this function to return different list of menu classes according to the given arguments.

If no menus are returned, then the user will need to attach menus to pages manually in the admin.

If no page and language are provided, this method **must** return **all the menus used by this apphook**. Example:

```
if page and page.reverse_id == 'page1':
    return [Menu1]
elif page and page.reverse_id == 'page2':
    return [Menu2]
else:
    return [Menu1, Menu2]
```

Parameters

- **page** – page the apphook is attached to
- **language** – current site language

Returns
list of menu classes

get_urls(*page=None*, *language=None*, ***kwargs*)

Returns the urlconfs for the apphook instance, eventually selected according to the given arguments.

By default, it returns the urls assigned to *CMSApp._urls*

The method accepts page, language and generic keyword arguments: you can customize this function to return different list of menu classes according to the given arguments.

This method **must** return a non-empty list of urlconfs, even if no argument is passed.

Parameters

- **page** – page the apphook is attached to
- **language** – current site language

Returns
list of urlconfs strings

app_config = None

configuration model (optional)

app_name = None

Gives the system a unique way to refer to the apphook. This enables Django namespaces support (optional)

exclude_permissions = []

list of application names to exclude from inheriting CMS permissions

name = None

Human-readable name of the apphook (required). This name will be displayed on the admin site.

permissions = True

if set to true, apphook inherits permissions from the current page

App Config

class cms.app_base.**CMSAppConfig**(*django_app_config*)

New in version 4.0.

Base class that all cms app configurations should inherit from.

CMSAppConfig live in a file called `cms_config.py`.

Apps subclassing `CMSAppConfig` can set `cms_enabled = True` for their app config to use django CMS' wizard functionality. Additional wizzwards are listed in the app config's `cms_wizzards` property.

The second functionality that django CMS offers is attaching Model objects to the toolbar. To use this functionality, set list the Model classes in `cms_toolbar_enabled_models` and have *cms_enabled = True* ``

App Extensions

class cms.app_base.**CMSAppExtension**

New in version 4.0.

Base class that all cms app extensions should inherit from. App extensions allow apps to offer their functionality to other apps, e.g., as done by djangocms-versioning.

CMSAppExtensions live in a file called `cms_config.py`.

abstract configure_app(*cms_config*)

Implement this method if the app provides functionality that other apps can use and configure.

This method will be run once for every app that defines an attribute like `<app_label>_enabled` as `True` on its cms app config class.

So for example, if app A with label "app_a" implements this method and app B and app C define `app_a_enabled = True` on their cms config classes, the method app A has defined will run twice, once for app B and once for app C.

Parameters

cms_config (*CMSAppConfig* subclass) – the cms config class of the app registering for additional functionality

ready()

Override this method to run code after all CMS extensions have been configured.

This method will be run once, even if no cms app config sets its `<app_label>_enabled` attribute to `True`

Form and model fields

Model fields

class cms.models.fields.**PageField**(***kwargs*)

Bases: `ForeignKey`

This is a foreign key field to the *cms.models.pagemodel.Page* model that defaults to the *PageSelectFormField* form field when rendered in forms. It has the same API as the *django.db.models.ForeignKey* but does not require the `othermodel` argument.

default_form_class

alias of *PageSelectFormField*

formfield(***kwargs*)

Pass `limit_choices_to` to the field being constructed.

Only passes it if there is a type that supports related fields. This is a similar strategy used to pass the `queryset` to the field being constructed.

class cms.models.fields.**PlaceholderRelationField**(*checks=None*, ***kwargs*)

Bases: `GenericRelation`

`GenericForeignKey` to placeholders.

If you create a model which contains placeholders you first create the `PlaceHolderRelationField`:

```
from cms.utils.placeholder import get_placeholder_from_slot

class Post(models.Model):
    ...
    placeholders = PlaceholderRelationField()  # Generic relation

    @cached_property
    def content(self):
        return get_placeholder_from_slot(self.placeholders, "content")  # A␣
↪specific placeholder
```

class cms.models.fields.**PlaceholderField**(*slotname*, *default_width=None*, *actions=None*, ***kwargs*)

> **Warning:** This field is for django CMS versions below 4 only. It may only used for migrations.

The `PlaceholderField` has been replaced by the *`PlaceholderRelationField`*, the built-in migrations will automatically take care of the replacement.

See documentation of *`PlaceholderRelationField`* for how to replace the code.

Form fields

class cms.forms.fields.**PageSelectFormField**(*queryset=None*, *empty_label='---------'*, *cache_choices=False*, *required=True*, *widget=None*, *to_field_name=None*, *limit_choices_to=None*, **args*, ***kwargs*)

Behaves like a `django.forms.ModelChoiceField` field for the *`cms.models.pagemodel.Page`* model, but displays itself as a split field with a select drop-down for the site and one for the page. It also indents the page names based on what level they're on, so that the page select drop-down is easier to use. This takes the same arguments as `django.forms.ModelChoiceField`.

widget

alias of `PageSelectWidget`

compress(*data_list*)

Return a single value for the given list of values. The values can be assumed to be valid.

For example, if this MultiValueField was instantiated with fields=(DateField(), TimeField()), this might return a datetime object created by combining the date and time in data_list.

has_changed(*initial*, *data*)

Return True if data differs from initial.

class cms.forms.fields.**PageSmartLinkField**(*max_length=None*, *min_length=None*, *placeholder_text=None*, *ajax_view=None*, **args*, ***kwargs*)

A field making use of `cms.forms.widgets.PageSmartLinkWidget`. This field will offer you a list of matching internal pages as you type. You can either pick one or enter an arbitrary URL to create a non-existing entry. Takes a *placeholder_text* argument to define the text displayed inside the input before you type.

The widget uses an ajax request to try to find pages match. It will try to find case-insensitive matches amongst public and published pages on the *title*, *path*, *page_title*, *menu_title* fields.

widget

alias of `PageSmartLinkWidget`

clean(*value*)

Validate the given value and return its "cleaned" value as an appropriate Python object. Raise ValidationError for any errors.

widget_attrs(*widget*)

Given a Widget instance (*not* a Widget class), return a dictionary of any HTML attributes that should be added to the Widget, based on this Field.

User site navigation

There are four template tags for use in the templates that are connected to the menu:

- *show_menu*
- *show_menu_below_id*
- *show_sub_menu*
- *show_breadcrumb*

To use any of these template tags, you need to have `{% load menu_tags %}` in your template before the line on which you call the template tag.

Note: Please note that menus live in the `menus` application, which though tightly coupled to the `cms` application exists independently of it. Menus are usable by any application, not just by django CMS.

show_menu

The `show_menu` tag renders the navigation of the current page. You can overwrite the appearance and the HTML if you add a `menu/menu.html` template to your project or edit the one provided with django CMS. `show_menu` takes six optional parameters: `start_level`, `end_level`, `extra_inactive`, `extra_active`, `namespace` and `root_id`.

The first two parameters, `start_level` (default=0) and `end_level` (default=100) specify from which level the navigation should be rendered and at which level it should stop. If you have home as a root node (i.e. level 0) and don't want to display the root node(s), set `start_level` to 1.

The third parameter, `extra_inactive` (default=0), specifies how many levels of navigation should be displayed if a node is not a direct ancestor or descendant of the current active node.

The fourth parameter, `extra_active` (default=100), specifies how many levels of descendants of the currently active node should be displayed.

The fifth parameter, `namespace`, is currently not implemented.

The sixth parameter `root_id` specifies the id of the root node.

You can supply a `template` parameter to the tag.

Some Examples

Complete navigation (as a nested list):

```
{% load menu_tags %}
<ul>
    {% show_menu 0 100 100 100 %}
</ul>
```

Navigation with active tree (as a nested list):

```
<ul>
    {% show_menu 0 100 0 100 %}
</ul>
```

Navigation with only one active extra level:

```
<ul>
    {% show_menu 0 100 0 1 %}
</ul>
```

Level 1 navigation (as a nested list):

```
<ul>
    {% show_menu 1 %}
</ul>
```

Navigation with a custom template:

```
{% show_menu 0 100 100 100 "myapp/menu.html" %}
```

show_menu_below_id

If you have set an id in the advanced settings of a page, you can display the sub-menu of this page with a template tag. For example, we have a page called meta that is not displayed in the navigation and that has the id "meta":

```
<ul>
    {% show_menu_below_id "meta" %}
</ul>
```

You can give it the same optional parameters as `show_menu`:

```
<ul>
    {% show_menu_below_id "meta" 0 100 100 100 "myapp/menu.html" %}
</ul>
```

Unlike *`show_menu`*, however, soft roots will not affect the menu when using *`show_menu_below_id`*.

show_sub_menu

Displays the sub menu of the current page (as a nested list).

The first argument, `levels` (`default=100`), specifies how many levels deep the sub menu should be displayed.

The second argument, `root_level` (`default=None`), specifies at what level, if any, the menu should have its root. For example, if root_level is 0 the menu will start at that level regardless of what level the current page is on.

The third argument, `nephews` (`default=100`), specifies how many levels of nephews (children of siblings) are shown.

Fourth argument, `template` (`default=menu/sub_menu.html`), is the template used by the tag; if you want to use a different template you **must** supply default values for `root_level` and `nephews`.

Examples:

```
<ul>
    {% show_sub_menu 1 %}
</ul>
```

Rooted at level 0:

```
<ul>
    {% show_sub_menu 1 0 %}
</ul>
```

Or with a custom template:

```
<ul>
    {% show_sub_menu 1 None 100 "myapp/submenu.html" %}
</ul>
```

show_breadcrumb

Show the breadcrumb navigation of the current page. The template for the HTML can be found at `menu/breadcrumb.html`.:

```
{% show_breadcrumb %}
```

Or with a custom template and only display level 2 or higher:

```
{% show_breadcrumb 2 "myapp/breadcrumb.html" %}
```

Usually, only pages visible in the navigation are shown in the breadcrumb. To include *all* pages in the breadcrumb, write:

```
{% show_breadcrumb 0 "menu/breadcrumb.html" 0 %}
```

If the current URL is not handled by the CMS or by a navigation extender, the current menu node can not be determined. In this case you may need to provide your own breadcrumb via the template. This is mostly needed for pages like login, logout and third-party apps. This can easily be accomplished by a block you overwrite in your templates.

For example in your `base.html`:

```
<ul>
    {% block breadcrumb %}
    {% show_breadcrumb %}
    {% endblock %}
<ul>
```

And then in your app template:

```
{% block breadcrumb %}
<li><a href="/">home</a></li>
<li>My current page</li>
{% endblock %}
```

Properties of Navigation Nodes in templates

```
{{ node.is_leaf_node }}
```

Is it the last in the tree? If true it doesn't have any children.

```
{{ node.level }}
```

The level of the node. Starts at 0.

```
{{ node.menu_level }}
```

The level of the node from the root node of the menu. Starts at 0. If your menu starts at level 1 or you have a "soft root" (described in the next section) the first node would still have 0 as its `menu_level`.

```
{{ node.get_absolute_url }}
```

The absolute URL of the node, without any protocol, domain or port.

```
{{ node.title }}
```

The title in the current language of the node.

```
{{ node.selected }}
```

If true this node is the current one selected/active at this URL.

```
{{ node.ancestor }}
```

If true this node is an ancestor of the current selected node.

```
{{ node.sibling }}
```

If true this node is a sibling of the current selected node.

```
{{ node.descendant }}
```

If true this node is a descendant of the current selected node.

```
{{ node.soft_root }}
```

If true this node is a *soft root*. A page can be marked as a *soft root* in its 'Advanced Settings'.

Menu system classes and function

class menus.base.**Menu**(*renderer*)

The base class for all menu-generating classes.

get_nodes(*request*)

Each subclass of Menu should return a list of `menus.base.NavigationNode` instances.

class menus.base.**Modifier**(*renderer*)

The base class for all menu-modifying classes. A modifier add, removes or changes `menus.base.NavigationNode` in the list.

modify(*request*, *nodes*, *namespace*, *root_id*, *post_cut*, *breadcrumb*)

Each subclass of `Modifier` should implement a `modify()` method.

class menus.base.**NavigationNode**(*title*, *url*, *id*, *parent_id=None*, *parent_namespace=None*, *attr=None*, *visible=True*)

Each node in a menu tree is represented by a `NavigationNode` instance.

get_absolute_url()

Utility method to return the URL associated with this menu item, primarily to follow naming convention asserted by Django.

get_ancestors()

Returns a list of all parent items, excluding the current menu item.

get_attribute(*name*)

Retrieves a dictionary item from `attr`. Returns `None` if it does not exist.

get_descendants()

Returns a list of all children beneath the current menu item.

get_menu_title()

Utility method to return the associated title, using the same naming convention used by `cms.models.pagemodel.Page`.

attr

A dictionary, provided in order that arbitrary attributes may be added to the node - placing them directly on the node itself could cause a clash with an existing or future attribute.

An important key in this dictionary is `is_page`: if `True`, the node represents a django CMS `Page` object.

Nodes that represent CMS pages have the following keys in `attr`:

- **auth_required** (*bool*) – is authentication required to access this page
- **is_page** (*bool*) – Always True
- **navigation_extenders** (*list*) – navigation extenders connected to this node
- **redirect_url** (*str*) – redirect URL of page (if any)
- **reverse_id** (*str*) – unique identifier for the page
- **soft_root** (*bool*) – whether page is a soft root

- **visible_for_authenticated** (*bool*) – visible for authenticated users
- **visible_for_anonymous** (*bool*) – visible for anonymous users

class menus.menu_pool.**MenuPool**

clear(*site_id=None*, *language=None*, *all=False*)

This invalidates the cache for a given menu (site_id and language)

get_menus_by_attribute(*name*, *value*)

Returns the list of menus that match the name/value criteria provided.

get_registered_menus(*for_rendering=False*)

Returns all registered menu classes.

Parameters

for_rendering – Flag that when True forces us to include all CMSAttachMenu subclasses, even if they're not attached.

class menus.menu_pool.**MenuPool**

get_nodes()

discover_menus()

apply_modifiers()

_build_nodes()

_mark_selected()

menus.menu_pool.**_build_nodes_inner_for_one_menu**()

menus.templatetags.menu_tags.**cut_levels**()

class menus.templatetags.menu_tags.**ShowMenu**

get_context()

class menus.base.**NavigationNode**(*title*, *url*, *id*, *parent_id=None*, *parent_namespace=None*, *attr=None*, *visible=True*)

Each node in a menu tree is represented by a `NavigationNode` instance.

__init__(*title*, *url*, *id*, *parent_id=None*, *parent_namespace=None*, *attr=None*, *visible=True*)

Parameters

- **title** (*str*) – The title to display this menu item with.
- **url** (*str*) – The URL associated with this menu item.
- **id** – Unique (for the current tree) ID of this item.
- **parent_id** – Optional, ID of the parent item.
- **parent_namespace** – Optional, namespace of the parent.
- **attr** (*dict*) – Optional, dictionary of additional information to store on this node.
- **visible** (*bool*) – Optional, defaults to `True`, whether this item is visible or not.

get_absolute_url()

Utility method to return the URL associated with this menu item, primarily to follow naming convention asserted by Django.

get_ancestors()

Returns a list of all parent items, excluding the current menu item.

get_attribute(*name*)

Retrieves a dictionary item from *attr*. Returns `None` if it does not exist.

get_descendants()

Returns a list of all children beneath the current menu item.

get_menu_title()

Utility method to return the associated title, using the same naming convention used by *cms.models.pagemodel.Page*.

attr

A dictionary, provided in order that arbitrary attributes may be added to the node - placing them directly on the node itself could cause a clash with an existing or future attribute.

An important key in this dictionary is `is_page`: if `True`, the node represents a django CMS `Page` object.

Nodes that represent CMS pages have the following keys in `attr`:

- **auth_required** (*bool*) – is authentication required to access this page
- **is_page** (*bool*) – Always True
- **navigation_extenders** (*list*) – navigation extenders connected to this node
- **redirect_url** (*str*) – redirect URL of page (if any)
- **reverse_id** (*str*) – unique identifier for the page
- **soft_root** (*bool*) – whether page is a soft root
- **visible_for_authenticated** (*bool*) – visible for authenticated users
- **visible_for_anonymous** (*bool*) – visible for anonymous users

class menus.modifiers.Marker(*renderer*)

searches the current selected node and marks them. current_node: selected = True siblings: sibling = True descendants: descendant = True ancestors: ancestor = True

class menus.modifiers.AuthVisibility(*renderer*)

Remove nodes that are login required or require a group

class menus.modifiers.Level(*renderer*)

marks all node levels

CMS menus

class cms.cms_menus.**CMSMenu**(*renderer*)

Subclass of *menus.base.Menu*. Its *get_nodes()* creates a list of NavigationNodes based on a site's *cms.models.pagemodel.Page* objects.

get_nodes(*request*)

Each subclass of Menu should return a list of *menus.base.NavigationNode* instances.

class cms.cms_menus.**NavExtender**(*renderer*)

modify(*request*, *nodes*, *namespace*, *root_id*, *post_cut*, *breadcrumb*)

Each subclass of `Modifier` should implement a *modify()* method.

class cms.cms_menus.**SoftRootCutter**(*renderer*)

A soft root is a page that acts as the root for a menu navigation tree.

Typically, this will be a page that is the root of a significant new section on your site.

When the soft root feature is enabled, the navigation menu for any page will start at the nearest soft root, rather than at the real root of the site's page hierarchy.

This feature is useful when your site has deep page hierarchies (and therefore multiple levels in its navigation trees). In such a case, you usually don't want to present site visitors with deep menus of nested items.

For example, you're on the page -Introduction to Bleeding-?, so the menu might look like this:

- **School of Medicine**
  - Medical Education
  - **Departments**
    - Department of Lorem Ipsum
    - Department of Donec Imperdiet
    - Department of Cras Eros
    - **Department of Mediaeval Surgery**
      - Theory
      - Cures
      - **Bleeding**

        Introduction to Bleeding <this is the current page>

        Bleeding - the scientific evidence

        Cleaning up the mess

        Cupping

        Leaches

        Maggots
      - Techniques
      - Instruments
    - Department of Curabitur a Purus
    - Department of Sed Accumsan

        - Department of Etiam
    - Research
    - Administration
    - Contact us
    - Impressum

which is frankly overwhelming.

By making "Department of Mediaeval Surgery" a soft root, the menu becomes much more manageable:

- **Department of Mediaeval Surgery**
    - Theory
    - **Cures**
        - **Bleeding**
            - Introduction to Bleeding <current page>
            - Bleeding - the scientific evidence
            - Cleaning up the mess
        - Cupping
        - Leaches
        - Maggots
    - Techniques
    - Instruments

find_ancestors_and_remove_children(*node*, *nodes*)

Check ancestors of node for soft roots

modify(*request*, *nodes*, *namespace*, *root_id*, *post_cut*, *breadcrumb*)

Each subclass of `Modifier` should implement a *modify()* method.

class cms.menu_bases.**CMSAttachMenu**(**args*, ***kwargs*)

Base class that can be subclassed to allow your app to attach its oqn menus.

classmethod get_apphooks()

Returns a list of apphooks to which this CMSAttachMenu is attached.

Calling this does **not** produce DB queries.

classmethod get_instances()

Return a queryset of all CMS Page objects (in this case) that are currently using this CMSAttachMenu either directly as a navigation_extender, or, as part of an apphook.

Calling this **does** perform a DB query.

Pages

class cms.models.pagemodel.**Page**(**args*, ***kwargs*)

Bases: Model

A Page is the basic unit of site structure in django CMS. The CMS uses a hierarchical page model: each page stands in relation to other pages as parent, child or sibling. This hierarchy is managed by the django-treebeard library.

A Page also has language-specific properties - for example, it will have a title and a slug for each language it exists in. These properties are managed by the PageContent model.

copy_with_descendants(*target_node=None*, *position=None*, *copy_permissions=True*, *target_site=None*, *user=None*)

Copy a page [and all its descendants to a new location]

get_application_urls(*language=None*, *fallback=True*, *force_reload=False*)

get application urls conf for application hook

get_changed_by(*language=None*, *fallback=True*, *force_reload=False*)

get user who last changed this page

get_changed_date(*language=None*, *fallback=True*, *force_reload=False*)

get when this page was last updated

get_content_obj(*language=None*, *fallback=True*, *force_reload=False*)

Helper function for accessing wanted / current title. If wanted title doesn't exist, EmptyPageContent instance will be returned.

get_media_path(*filename*)

Returns path (relative to MEDIA_ROOT/MEDIA_URL) to directory for storing page-scope files. This allows multiple pages to contain files with identical names without namespace issues. Plugins such as Picture can use this method to initialise the 'upload_to' parameter for File-based fields. For example:

image = models.ImageField(
_("image"), upload_to=CMSPlugin.get_media_path)

where CMSPlugin.get_media_path calls self.page.get_media_path

This location can be customised using the CMS_PAGE_MEDIA_PATH setting

get_menu_title(*language=None*, *fallback=True*, *force_reload=False*)

get the menu title of the page depending on the given language

get_meta_description(*language=None*, *fallback=True*, *force_reload=False*)

get content for the description meta tag for the page depending on the given language

get_page_content_obj_attribute(*attrname*, *language=None*, *fallback=True*, *force_reload=False*)

Helper function for getting attribute or None from wanted/current page content.

get_page_title(*language=None*, *fallback=True*, *force_reload=False*)

get the page title of the page depending on the given language

get_path(*language*, *fallback=True*)

Get the path of the page depending on the given language

get_redirect(*language=None*, *fallback=True*, *force_reload=False*)

get redirect

get_template_name()

get the textual name (2nd parameter in get_cms_setting('TEMPLATES')) of the template of this page or of the nearest ancestor. failing to find that, return the name of the default template.

get_title(*language=None*, *fallback=True*, *force_reload=False*)

get the title of the page depending on the given language

has_add_permission(*user*)

Has user ability to add page under current page?

has_change_permissions_permission(*user*)

Has user ability to change permissions for current page?

has_move_page_permission(*user*)

Has user ability to move current page?

is_potential_home()

Encapsulates logic for determining if this page is eligible to be set as *is_home*. This is a public method so that it can be accessed in the admin for determining whether to enable the "Set as home" menu item. :return: Boolean

move_page(*target_node*, *position='first-child'*)

Called from admin interface when page is moved. Should be used on all the places which are changing page position. Used like an interface to django-treebeard, but after move is done page_moved signal is fired.

Note for issue #1166: url conflicts are handled by updated check_title_slugs, overwrite_url on the moved page don't need any check as it remains the same regardless of the page position in the tree

reload()

Reload a page from the database

save(***kwargs*)

Save the current instance. Override this in a subclass if you want to control the saving process.

The 'force_insert' and 'force_update' parameters can be used to insist that the "save" must be an SQL insert or update (or equivalent for non-SQL backends), respectively. Normally, they should not be set.

set_as_homepage(*user=None*)

Sets the given page as the homepage. Updates the url paths for all affected pages. Returns the old home page (if any).

class cms.models.pagemodel.**PageUrl**(*id*, *slug*, *path*, *language*, *page*, *managed*)

Bases: `Model`

class cms.models.pagemodel.**PageType**(*id*, *created_by*, *changed_by*, *creation_date*, *changed_date*, *reverse_id*, *navigation_extenders*, *login_required*, *is_home*, *application_urls*, *application_namespace*, *languages*, *is_page_type*, *node*)

Bases: *Page*

is_potential_home()

Encapsulates logic for determining if this page is eligible to be set as *is_home*. This is a public method so that it can be accessed in the admin for determining whether to enable the "Set as home" menu item. :return: Boolean

.

Page contents

class cms.models.contentmodels.**PageContent**(*id*, *language*, *title*, *page_title*, *menu_title*, *meta_description*, *redirect*, *page*, *creation_date*, *created_by*, *changed_by*, *changed_date*, *in_navigation*, *soft_root*, *template*, *limit_visibility_in_menu*, *xframe_options*)

content_indicator()

returns the content indicator status. Without additional packages like djangocms-versioning page content always is public.

Return type

str

get_absolute_url(*language=None*)

Get the absolute url for the page content. If language is specified it will return the absolute url of the corresponding "sister" content.

get_template()

get the template of this page if defined or if closer parent if defined or DEFAULT_PAGE_TEMPLATE otherwise

get_template_name()

get the textual name (2nd parameter in get_cms_setting('TEMPLATES')) of the template of this title. failing to find that, return the name of the default template.

get_xframe_options()

Finds X_FRAME_OPTION from tree if inherited

is_editable(*request*)

returns True if page content object itself can be edited. Does not check user permissions to do that.

Return type

bool

rescan_placeholders()

Rescan and if necessary create placeholders in the current template.

save(***kwargs*)

Save the current instance. Override this in a subclass if you want to control the saving process.

The 'force_insert' and 'force_update' parameters can be used to insist that the "save" must be an SQL insert or update (or equivalent for non-SQL backends), respectively. Normally, they should not be set.

toggle_in_navigation(*set_to=None*)

Toggles (or sets) in_navigation and invalidates the cms page cache

admin_manager = <cms.models.managers.ContentAdminManager object>

Admin_manager does lack additional functionality of objects and must only be used inside admin objects or admin forms. One of its key properties is that it can access all objects of type PageContent (irrespevtively of some objects being hidden by third-party packages, e.g. due to viewing rights, publication or moderation status.

class cms.models.contentmodels.**EmptyPageContent**(*language*, *page=None*)

Empty title object, can be returned from `cms.models.pagemodel.Page.get_content_obj()` if required title object doesn't exist.

content_indicator()

returns the content indicator status. Empty page content always is empty

Return type

str

is_editable(*request*)

returns True if empty page content object itself can be edited. Since editing creates a new page content object this should always be True

Return type

bool

Page extensions and page content extensions

Extensions

class cms.extensions.models.**PageExtension**(**args*, ***kwargs*)

class cms.extensions.models.**PageContentExtension**(**args*, ***kwargs*)

Admin

class cms.extensions.admin.**PageExtensionAdmin**(*model*, *admin_site*)

add_view(*request*, *form_url=''*, *extra_context=None*)

Check if the page already has an extension object. If so, redirect to edit view instead.

delete_model(*request*, *obj*)

Given a model instance delete it from the database.

get_model_perms(*request*)

Return empty perms dict thus hiding the model from admin index.

save_model(*request*, *obj*, *form*, *change*)

Given a model instance save it to the database.

class cms.extensions.admin.**PageContentExtensionAdmin**(*model*, *admin_site*)

add_view(*request*, *form_url=''*, *extra_context=None*)

Check if the page already has an extension object. If so, redirect to edit view instead.

delete_model(*request*, *obj*)

Given a model instance delete it from the database.

get_model_perms(*request*)

Return empty perms dict thus hiding the model from admin index.

save_model(*request*, *obj*, *form*, *change*)

Given a model instance save it to the database.

Toolbar

class cms.extensions.toolbar.**ExtensionToolbar**(*request*, *toolbar*, *is_current_app*, *app_path*)

Offers simplified API for providing the user access to the admin of page extensions and page content extensions through the toolbar.

get_page_content_extension_admin(*page_content_obj=None*)

Get the admin url for the page content extensions menu item, depending on whether a *PageContentExtension* instance exists for the *PageContent* displayed.

Return a tuple of the page content extension and the url; the extension is None if no instance exists, the url is None is no admin is registered for the extension.

get_page_extension_admin()

Get the admin url for the page extension menu item, depending on whether a PageExtension instance exists for the current page or not.

Return a tuple of the current extension and the url; the extension is None if no instance exists, the url is None is no admin is registered for the extension.

get_title_extension_admin(*language=None*)

Deprecated.

Reflects now obsolete behavior in django CMS 3.x:

Get the admin urls for the page content extensions menu items, depending on whether a *PageContentExtension* instance exists for each *PageContent* in the current page. A single language can be passed to only work on a single page content object.

Return a list of tuples of the page content extension and the url; the extension is None if no instance exists, the url is None is no admin is registered for the extension.

Permissions

class cms.models.permissionmodels.**PagePermission**(**args*, ***kwargs*)

Page permissions for a single page

cms.models.permissionmodels.**ACCESS_PAGE = 1**

Access to the page itself

cms.models.permissionmodels.**ACCESS_CHILDREN = 2**

Access to immediate children (1 level)

cms.models.permissionmodels.**ACCESS_DESCENDANTS = 4**

Access to all children (first level and also their children)

cms.models.permissionmodels.**ACCESS_PAGE_AND_DESCENDANTS = 5**

Access to page itself and all children (first level and also their children)

Placeholders

class cms.models.placeholdermodel.**Placeholder**(**args*, ***kwargs*)

Bases: Model

Placeholders can be filled with plugins, which store or generate content.

add_plugin(*instance*)

New in version 4.0.

Adds a plugin to the placeholder. The plugin's position field must be set to the target position. Positions are enumerated from the start of the palceholder's plugin tree (1) to the last plugin (*n*, where *n* is the number of plugins in the placeholder).

Parameters

instance (*cms.models.pluginmodel.CMSPlugin* instance) – Plugin to add. It's position parameter needs to be set.

Note: As of version 4 of django CMS the position counter does not re-start at 1 for the first child plugin. The position field and language field are unique for a placeholder.

Example:

```
new_child = MyCoolPlugin()
new_child.position = parent_plugin.position + 1  # add as first child:␣
↪directly after parent
parent_plugin.placeholder.add(new_child)
```

clear(*language=None*)

Deletes all plugins from the placeholder

delete_plugin(*instance*)

New in version 4.0.

Removes a plugin and its descendants from the placeholder and database.

Parameters

instance (*cms.models.pluginmodel.CMSPlugin* instance) – Plugin to add. It's position parameter needs to be set.

get_cache_expiration(*request*, *response_timestamp*)

Returns the number of seconds (from «response_timestamp») that this placeholder can be cached. This is derived from the plugins it contains.

This method must return: EXPIRE_NOW <= int <= MAX_EXPIRATION_IN_SECONDS

Return type

int

get_filled_languages()

Returns language objects for every language for which the placeholder has plugins.

This is not cached as it's meant to be used in the frontend editor.

get_next_plugin_position(*language*, *parent=None*, *insert_order='first'*)

New in version 4.0.

Helper to calculate plugin positions correctly.

Parameters

- **language** (*str*) – language for which the position is to be calculated

- **parent** (*cms.models.pluginmodel.CMSPlugin* instance) – Parent plugin or None (if position is on top level)
- **insert_order** (*str*) – Either "first" (default) or "last"

get_plugin_tree_order(*language*, *parent_id=None*)

Returns a list of plugin ids matching the given language ordered by plugin position.

get_plugins(*language=None*)

Returns a queryset of plugins attached to this placeholder. If language is given only plugins in the given language are returned.

get_plugins_list(*language=None*)

Returns a list of plugins attached to this placeholder. If language is given only plugins in the given language are returned.

get_vary_cache_on(*request*)

Returns a list of VARY headers.

has_add_plugin_permission(*user*, *plugin_type*)

Returns True if user has permission to add plugin_type to this placeholder.

has_add_plugins_permission(*user*, *plugins*)

Returns True if user has permission to add **all** plugins in plugins to this placeholder.

has_change_permission(*user*)

Returns True if user has permission to change all models attached to this placeholder.

has_change_plugin_permission(*user*, *plugin*)

Returns True if user has permission to change plugin to this placeholder.

has_clear_permission(*user*, *languages*)

Returns True if user has permission to delete all plugins in this placeholder

has_delete_plugin_permission(*user*, *plugin*)

Returns True if user has permission to delete plugin to this placeholder.

has_delete_plugins_permission(*user*, *languages*)

Returns True if user has permission to delete all plugins in this placeholder

has_move_plugin_permission(*user*, *plugin*, *target_placeholder*)

Returns True if user has permission to move plugin to the target_placeholder.

has_plugins(*language=None*)

Checks if placeholder is empty (False) or populated (True)

move_plugin(*plugin*, *target_position*, *target_placeholder=None*, *target_plugin=None*)

New in version 4.0.

Moves a plugin within the placeholder (target_placeholder=None) or to another placeholder.

Parameters

- **plugin** (*cms.models.pluginmodel.CMSPlugin* instance) – Plugin to move
- **target_position** (*int*) – The plugin's new position
- **target_placeholder** (*cms.models.placeholdermodel.Placeholder* instance) – Placeholder to move plugin to (or None)

- **target_plugin** (*cms.models.pluginmodel.CMSPlugin* instance) – New parent plugin (or `None`). The target plugin must be in the same placeholder or in the `target_placeholder` if one is given.

The `target_position` is enumerated from the start of the palceholder's plugin tree (1) to the last plugin (*n*, where *n* is the number of plugins in the placeholder).

cache_placeholder = True

Flag caching the palceholder's content

default_width

A default width is passed to the templace context as `width`

is_editable = True

If False the content of the placeholder is not editable in the frontend

is_static = False

Set to "True" for static placeholders (by the template tag)

property page

Gives the page object if the placeholder belongs to a `cms.models.titlemodels.PageContent` object (and not to some other model.) If the placeholder is not attached to a page it returns `None`

slot

slot name that appears in the frontend

class cms.admin.placeholderadmin.**FrontendEditableAdminMixin**

Adding `FrontendEditableAdminMixin` to models admin class allows to open that admin in the frontend by double-clicking on fields rendered with the `render_model` template tag.

get_urls()

Register the url for the single field edit view

class cms.admin.placeholderadmin.**PlaceholderAdminMixin**

> **Warning:** PlaceholderAdminMixin is deprecated. It is no longer needed and thus will be removed

Plugins

class cms.plugin_base.**CMSPluginBase**(*model=None*, *admin_site=None*)

Inherits `django.contrib.admin.ModelAdmin` and in most respects behaves like a normal subclass.

Note however that some attributes of `ModelAdmin` simply won't make sense in the context of a Plugin.

get_render_template(*self*, *context*, *instance*, *placeholder*)

If you need to determine the plugin render model at render time you can implement the *get_render_template()* method on the plugin class; this method takes the same arguments as `render`.

The method **must** return a valid template file path.

Example:

```
def get_render_template(self, context, instance, placeholder):
    if instance.attr = 'one':
        return 'template1.html'
    else:
        return 'template2.html'
```

See also: *render_plugin()* , *render_template()*

model

If the plugin requires per-instance settings, then this setting must be set to a model that inherits from *CMSPlugin*. See also: *Storing configuration*.

alias of *CMSPlugin*

get_cache_expiration(*request*, *instance*, *placeholder*)

Provides hints to the placeholder, and in turn to the page for determining the appropriate Cache-Control headers to add to the HTTPResponse object.

Parameters

- **request** – Relevant `HTTPRequest` instance.
- **instance** – The `CMSPlugin` instance that is being rendered.

Return type

`None` or `datetime` or `` `time_delta `` or `int`

Must return one of:

None

This means the placeholder and the page will not even consider this plugin when calculating the page expiration;

Datetime

A specific date and time (timezone-aware) in the future when this plugin's content expires;

Important: The returned `datetime` must be timezone-aware or the plugin will be ignored (with a warning) during expiration calculations.

Datetime.timedelta

A timedelta instance indicating how long, relative to the response timestamp that the content can be cached;

Int

An integer number of seconds that this plugin's content can be cached.

There are constants are defined in `cms.constants` that may be useful: *EXPIRE_NOW* and *MAX_EXPIRATION_TTL*.

An integer value of 0 (zero) or *EXPIRE_NOW* effectively means "do not cache". Negative values will be treated as *EXPIRE_NOW*. Values exceeding the value *~cms.constants.MAX_EXPIRATION_TTL* will be set to that value.

Negative *timedelta* values or those greater than *MAX_EXPIRATION_TTL* will also be ranged in the same manner.

Similarly, *datetime* values earlier than now will be treated as *EXPIRE_NOW*. Values greater than *MAX_EXPIRATION_TTL* seconds in the future will be treated as *MAX_EXPIRATION_TTL* seconds in the future.

classmethod get_child_class_overrides(*slot*, *page*)

Returns a list of plugin types that are allowed as children of this plugin.

classmethod get_child_classes(*slot*, *page*, *instance=None*)

Returns a list of plugin types that can be added as children to this plugin.

classmethod get_child_plugin_candidates(*slot*, *page*)

Returns a list of all plugin classes that will be considered when fetching all available child classes for this plugin.

classmethod get_empty_change_form_text(*obj=None*)

Returns the text displayed to the user when editing a plugin that requires no configuration.

classmethod get_extra_placeholder_menu_items(*request*, *placeholder*)

Extends the placeholder context menu for all placeholders.

To add one or more custom context menu items that are displayed in the context menu for all placeholders when in structure mode, override this method in a related plugin to return a list of *cms.plugin_base.PluginMenuItem* instances.

classmethod get_extra_plugin_menu_items(*request*, *plugin*)

Extends the plugin context menu for all plugins.

To add one or more custom context menu items that are displayed in the context menu for all plugins when in structure mode, override this method in a related plugin to return a list of *cms.plugin_base.PluginMenuItem* instances.

get_fieldsets(*request*, *obj=None*)

Same as from base class except if there are no fields, show an info message.

get_plugin_urls()

Returns the URL patterns the plugin wants to register views for. They are included under django CMS's page admin URLS in the plugin path (e.g.: `/admin/cms/page/plugin/<plugin-name>/` in the default case).

`get_plugin_urls()` is useful if your plugin needs to talk asynchronously to the admin.

get_vary_cache_on(*request*, *instance*, *placeholder*)

Returns an HTTP VARY header string or a list of them to be considered by the placeholder and in turn by the page to caching behaviour.

Overriding this method is optional.

Must return one of:

None
: This means that this plugin declares no headers for the cache to be varied upon. (default)

String
: The name of a header to vary caching upon.

List of strings
: A list of strings, each corresponding to a header to vary the cache upon.

Note: This only makes sense to use with caching. If this plugin has `cache = False` or plugin.get_cache_expiration(...) returns 0, get_vary_cache_on() will have no effect.

---

icon_alt(*instance*)

Overwrite this if necessary if `text_enabled = True` Return the 'alt' text to be used for an icon representing the plugin object in a text editor.

Parameters
: **instance** (*cms.models.pluginmodel.CMSPlugin* instance) – The instance of the plugin model to provide specific information for the 'alt' text.

By default *icon_alt()* will return a string of the form: "[plugin type] - [instance]", but can be modified to return anything you like.

This function accepts the `instance` as a parameter and returns a string to be used as the `alt` text for the plugin's preview or icon.

Authors of text-enabled plugins should consider overriding this function as it will be rendered as a tooltip in most browser. This is useful, because if the same plugin is used multiple times, this tooltip can provide information about its configuration.

See also: *text_enabled*, *icon_src()*.

icon_src(*instance*)

By default, this returns an empty string, which, if left un-overridden would result in no icon rendered at all, which, in turn, would render the plugin un-editable by the operator inside a parent text plugin.

Therefore, this should be overridden when the plugin has text_enabled set to True to return the path to an icon to display in the text of the text plugin.

Since djangocms-text-ckeditor introduced inline previews of plugins, the icon will not be rendered in TextPlugins anymore.

Parameters

instance (*cms.models.pluginmodel.CMSPlugin* instance) – The instance of the plugin model.

Example:

```
def icon_src(self, instance):
    return settings.STATIC_URL + "cms/img/icons/plugins/link.png"
```

See also: *text_enabled*, *icon_alt()*

log_addition(*request*, *obj*, *bypass=None*)

Log that an object has been successfully added.

The default implementation creates an admin LogEntry object.

log_change(*request*, *obj*, *message*, *bypass=None*)

Log that an object has been successfully changed.

The default implementation creates an admin LogEntry object.

log_deletion(*request*, *obj*, *object_repr*, *bypass=None*)

Log that an object will be deleted. Note that this method must be called before the deletion.

The default implementation creates an admin LogEntry object.

render(*context*, *instance*, *placeholder*)

This method returns the context to be used to render the template specified in *render_template*.

Parameters

- **context** (*dict*) – The context with which the page is rendered.
- **instance** (*cms.models.pluginmodel.CMSPlugin* instance) – The instance of your plugin that is rendered.
- **placeholder** (*str*) – The name of the placeholder that is rendered.

Return type

dict or `django.template.Context`

This method must return a dictionary or an instance of `django.template.Context`, which will be used as context to render the plugin template.

By default, this method will add `instance` and `placeholder` to the context, which means for simple plugins, there is no need to overwrite this method.

If you overwrite this method it's recommended to always populate the context with default values by calling the render method of the super class:

```
def render(self, context, instance, placeholder):
    context = super().render(context, instance, placeholder)
    ...
    return context
```

render_change_form(*request*, *context*, *add=False*, *change=False*, *form_url=''*, *obj=None*)

We just need the popup interface here

response_add(*request*, *obj*, ***kwargs*)

Determine the HttpResponse for the add_view stage.

response_change(*request*, *obj*)

Determine the HttpResponse for the change_view stage.

save_form(*request*, *form*, *change*)

Given a ModelForm return an unsaved instance. `change` is True if the object is being changed, and False if it's being added.

save_model(*request*, *obj*, *form*, *change*)

Override original method, and add some attributes to obj This has to be made, because if the object is newly created, it must know where it lives.

admin_preview = False

If True, displays a preview in the admin.

allow_children = False

Allows this plugin to have child plugins - other plugins placed inside it?

If `True` you need to ensure that your plugin can render its children in the plugin template. For example:

```
{% load cms_tags %}
<div class="myplugin">
    {{ instance.my_content }}
    {% for plugin in instance.child_plugin_instances %}
        {% render_plugin plugin %}
    {% endfor %}
</div>
```

`instance.child_plugin_instances` provides access to all the plugin's children. They are pre-filled and ready to use. The child plugins should be rendered using the `{% render_plugin %}` template tag.

See also: *child_classes*, *parent_classes*, *require_parent*.

cache = True

Is this plugin cacheable? If your plugin displays content based on the user or request or other dynamic properties set this to `False`.

If present and set to `False`, the plugin will prevent the caching of the resulting page.

Important: Setting this to `False` will effectively disable the CMS page cache and all upstream caches for pages where the plugin appears. This may be useful in certain cases but for general cache management, consider using the much more capable *get_cache_expiration()*.

> **Warning:** If you disable a plugin cache be sure to restart the server and clear the cache afterwards.

change_form_template = 'admin/cms/page/plugin/change_form.html'

The template used to render the form when you edit the plugin.

Example:

```
class MyPlugin(CMSPluginBase):
    model = MyModel
    name = _("My Plugin")
    render_template = "cms/plugins/my_plugin.html"
    change_form_template = "admin/cms/page/plugin_change_form.html"
```

See also: `frontend_edit_template`.

child_classes = None

A list of Plugin Class Names. If this is set, only plugins listed here can be added to this plugin. See also: *parent_classes*.

disable_child_plugins = False

Disables *dragging* of child plugins in structure mode.

form = None

Custom form class to be used to edit this plugin.

module = 'Generic'

Modules collect plugins of similar type

name = ''

Name of the plugin needs to be set in child classes

page_only = False

Set to `True` if this plugin should only be used in a placeholder that is attached to a django CMS page, and not other models with `PlaceholderFields`. See also: *child_classes*, *parent_classes*, *require_parent*.

parent_classes = None

A list of the names of permissible parent classes for this plugin. See also: *child_classes*, *require_parent*.

render_plugin = True

If set to `False`, this plugin will not be rendered at all. If `True`, *render_template()* must also be defined. See also: *render_template*, *get_render_template()*.

render_template = None

The path to the template used to render the template. If `render_plugin` is `True` either this or `get_render_template` **must** be defined. See also: *render_plugin* , *get_render_template()*.

require_parent = False

Is it required that this plugin is a child of another plugin? Or can it be added to any placeholder, even one attached to a page. See also: *child_classes*, *parent_classes*.

text_enabled = False

This attribute controls whether your plugin will be usable (and rendered) in a text plugin. When you edit a text plugin on a page, the plugin will show up in the *CMS Plugins* dropdown and can be configured and inserted. The output will even be previewed in the text editor.

Of course, not all plugins are usable in text plugins. Therefore the default of this attribute is `False`. If your plugin *is* usable in a text plugin:

1. set this to `True`
2. make sure your plugin provides its own `icon_alt()`, this will be used as a tooltip in

   the text-editor and comes in handy when you use multiple plugins in your text.

See also: `icon_alt()`, `icon_src()`.

class `cms.plugin_base.`**`PluginMenuItem`**(*name*, *url*, *data=None*, *question=None*, *action='ajax'*, *attributes=None*)

Creates an item in the plugin / placeholder menu

Parameters

- **`name`** – Item name (label)
- **`url`** – URL the item points to. This URL will be called using POST
- **`data`** – Data to be POSTed to the above URL
- **`question`** – Confirmation text to be shown to the user prior to call the given URL (optional)
- **`action`** – Custom action to be called on click; currently supported: 'ajax', 'ajax_add'
- **`attributes`** – Dictionary whose content will be added as data-attributes to the menu item

class `cms.models.pluginmodel.`**`CMSPlugin`**(**args*, ***kwargs*)

The base class for a CMS plugin model. When defining a new custom plugin, you should store plugin-instance specific information on a subclass of this class. (An example for this would be to store the number of pictures to display in a gallery.)

Two restrictions apply when subclassing this to use in your own models:

1. Subclasses of CMSPlugin **cannot be further subclassed**
2. Subclasses of CMSPlugin cannot define a "text" field.

`exception DoesNotExist`

`exception MultipleObjectsReturned`

`copy_relations`(*old_instance*)

Handle copying of any relations attached to this plugin. Custom plugins have to do this themselves.

See also: *Handling Relations*, `post_copy()`.

Parameters

`old_instance` (`CMSPlugin` instance) – Source plugin instance

`get_action_urls`(*js_compat=True*)

Returns

dict of action urls for edit, add, delete, copy, and move plugin.

This method replaces the set of legacy methods *get_add_url*, ``get_edit_url`, *get_move_url*, *get_delete_url*, *get_copy_url*.

`get_bound_plugin`()

Returns an instance of the plugin model configured for this plugin type.

`get_instance_icon_alt`()

Get alt text for instance's icon

`get_instance_icon_src`()

Get src URL for instance's icon

get_plugin_instance(*admin=None*)

For a plugin instance (usually as a CMSPluginBase), this method returns the downcasted (i.e., correctly typed subclass of CMSPluginBase) instacnce and the plugin class

Returns

Tuple (instance, plugin)

instance: The instance AS THE APPROPRIATE SUBCLASS OF CMSPluginBase and not necessarily just 'self', which is often just a CMSPluginBase,

plugin: the associated plugin class instance (subclass of CMSPlugin)

notify_on_autoadd(*request*, *conf*)

Method called when we auto add this plugin via default_plugins in CMS_PLACEHOLDER_CONF.

Some specific plugins may have some special stuff to do when they are auto added.

notify_on_autoadd_children(*request*, *conf*, *children*)

Method called when we auto add children to this plugin via default_plugins/<plugin>/children in CMS_PLACEHOLDER_CONF.

Some specific plugins may have some special stuff to do when we add children to them. ie : TextPlugin must update its content to add HTML tags to be able to see his children in WYSIWYG.

post_copy(*old_instance*, *new_old_ziplist*)

Can (should) be overridden to handle the copying of plugins which contain children plugins after the original parent has been copied.

E.g., TextPlugins use this to correct the references in the text to child plugins. copied

refresh_from_db(**args*, ***kwargs*)

Reload field values from the database.

By default, the reloading happens from the database this instance was loaded from, or by the read router if this instance wasn't loaded from any database. The using parameter will override the default.

Fields can be used to specify which fields to reload. The fields should be an iterable of field attnames. If fields is None, then all non-deferred fields are reloaded.

When accessing deferred fields of an instance, the deferred loading of the field will call this method.

changed_date

django:django.db.models.DateTimeField: Datetime the plugin was last changed

creation_date

django:django.db.models.DateTimeField: Datetime the plugin was created

language

`django.db.models.CharField`: Language of the plugin

parent

`django.db.models.ForeignKey`: Parent plugin or `None` for plugins at root level in the placeholder

placeholder

`django.db.models.ForeignKey`: Placeholder the plugin belongs to

plugin_type

django:django.db.models.CharField: Plugin type (name of the class as string)

position

`django.db.models.SmallIntegerField`: Position (unique for placeholder and language) starting with 1 for the first plugin in the placeholder

class cms.plugin_pool.**PluginPool**

get_plugin(*name*)

Retrieve a plugin from the cache.

register_plugin(*plugin*)

Registers the given plugin(s).

Static sanity checks is also performed.

If a plugin is already registered, this will raise PluginAlreadyRegistered.

unregister_plugin(*plugin*)

Unregisters the given plugin(s).

If a plugin isn't already registered, this will raise PluginNotRegistered.

validate_templates(*plugin=None*)

Plugins templates are validated at this stage

Plugin utility functions

cms.utils.plugins.**assign_plugins**(*request*, *placeholders*, *template=None*, *lang=None*)

Fetch all plugins for the given `placeholders` and cast them down to the concrete instances in one query per type.

cms.utils.plugins.**copy_plugins_to_placeholder**(*plugins*, *placeholder*, *language=None*, *root_plugin=None*, *start_positions=None*)

Copies an iterable of plugins to a placeholder

Parameters

- **plugins** (*iterable*) – Plugins to be copied
- **placeholder** (*cms.models.pluginmodel.CMSPlugin* instance) – Target placeholder
- **language** (*str*) – target language (if no root plugin is given)
- **root_plugin** –
- **start_positions** (*int*) – Cache for start positions by language

The logic of this method is the following:

1. Get bound plugins for each source plugin
2. Get the parent plugin (if it exists)
3. then get a copy of the source plugin instance
4. Set the id/pk to None to it the id of the generic plugin instance above; this will effectively change the generic plugin created above into a concrete one
5. find the position in the new plalceholder
6. save the concrete plugin (which creates a new plugin in the database)
7. trigger the copy relations
8. return the plugin ids

cms.utils.plugins.**downcast_plugins**(*plugins*, *placeholders=None*, *select_placeholder=False*, *request=None*)

cms.utils.plugins.**get_bound_plugins**(*plugins*)

cms.utils.plugins.**get_plugin_class**(*plugin_type: str*) → *CMSPluginBase*

Returns the plugin class for a given plugin_type (str)

`cms.utils.plugins.get_plugin_model(plugin_type: str) → CMSPlugin`

Returns the plugin model class for a given plugin_type (str)

`cms.utils.plugins.get_plugin_restrictions(plugin, page=None, restrictions_cache=None)`

`cms.utils.plugins.get_plugins(request, placeholder, template, lang=None)`

`cms.utils.plugins.get_plugins_as_layered_tree(plugins)`

Given an iterable of plugins ordered by position, returns a deque of root plugins with their respective children set in the child_plugin_instances attribute.

`cms.utils.plugins.has_reached_plugin_limit(placeholder, plugin_type, language, template=None)`

Checks if placeholder has reached its global plugin limit, if not then it checks if it has reached its plugin_type limit.

Sitemaps

`class cms.sitemaps.CMSSitemap`

Template Tags

CMS template tags

To use any of the following template tags you first need to load them at the top of your template:

```
{% load cms_tags %}
```

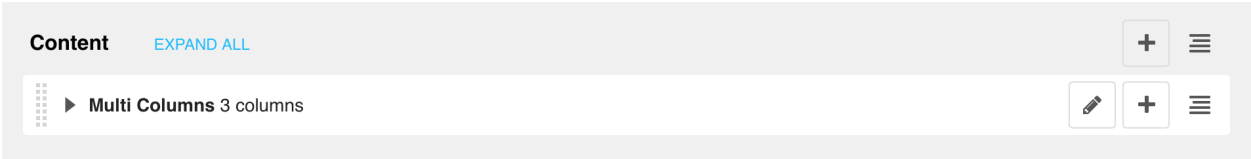
Placeholders

placeholder

The `placeholder` template tag defines a placeholder on a page. All placeholders in a template will be auto-detected and can be filled with plugins when editing a page that is using said template. When rendering, the content of these plugins will appear where the `placeholder` tag was.

Example:

```
{% placeholder "content" %}
```



If you want additional content to be displayed in case the placeholder is empty, use the `or` argument and an additional `{% endplaceholder %}` closing tag. Everything between `{% placeholder "..." or %}` and `{% endplaceholder %}` is rendered in the event that the placeholder has no plugins or the plugins do not generate any output.

Example:

```
{% placeholder "content" or %}There is no content.{% endplaceholder %}
```

If you want to add extra variables to the context of the placeholder, you should use Django's `with` tag. For instance, if you want to re-size images from your templates according to a context variable called `width`, you can pass it as follows:

```
{% with 320 as width %}{% placeholder "content" %}{% endwith %}
```

If you want the placeholder to inherit the content of a placeholder with the same name on parent pages, simply pass the `inherit` argument:

```
{% placeholder "content" inherit %}
```

This will walk up the page tree up until the root page and will show the first placeholder it can find with content.

It's also possible to combine this with the `or` argument to show an ultimate fallback if the placeholder and none of the placeholders on parent pages have plugins that generate content:

```
{% placeholder "content" inherit or %}There is no spoon.{% endplaceholder %}
```

See also the *CMS_PLACEHOLDER_CONF* setting where you can also add extra context variables and change some other placeholder behaviour.

Important: `{% placeholder %}` will only work inside the template's `<body>`.

static_placeholder

Changed in version 4.0.

The `static_placeholder` template tag does **not** work with django CMS 4. It will be removed in a future version.

Note: As a replacement use django CMS Alias instead. Once installed use `{% load djangocms_alias_tags %}` and `{% static_alias "footer" %}` as a replacement for `static_placeholder`

In connection with django CMS Versioning you can better manage versions of page parts that appear at several instances on your pages.

render_placeholder

`{% render_placeholder %}` is used if you have a PlaceholderField in your own model and want to render it in the template.

The *render_placeholder* tag takes the following parameters:

- *Placeholder* instance
- `width` parameter for context sensitive plugins (optional)
- `language` keyword plus `language-code` string to render content in the specified language (optional)
- `as` keyword followed by `varname` (optional): the template tag output can be saved as a context variable for later use.

The following example renders the `my_placeholder` field from the `mymodel_instance` and will render only the English (`en`) plugins:

```
{% load cms_tags %}

{% render_placeholder mymodel_instance.my_placeholder language 'en' %}
```

New in version 3.0.2: This template tag supports the `as` argument. With this you can assign the result of the template tag to a new variable that you can use elsewhere in the template.

Example:

```
{% render_placeholder mymodel_instance.my_placeholder as placeholder_content %}
<p>{{ placeholder_content }}</p>
```

When used in this manner, the placeholder will not be displayed for editing when the CMS is in edit mode.

See *How to use placeholders outside the CMS* or `PlaceholderRelationField` on how to get a specific placeholder instance.

render_uncached_placeholder

The same as `render_placeholder`, but the placeholder contents will not be cached or taken from the cache.

Arguments:

- `PlaceholderField` instance
- `width` parameter for context sensitive plugins (optional)
- `language` keyword plus `language-code` string to render content in the specified language (optional)
- `as` keyword followed by `varname` (optional): the template tag output can be saved as a context variable for later use.

Example:

```
{% render_uncached_placeholder mymodel_instance.my_placeholder language 'en' %}
```

show_placeholder

Displays a specific placeholder from a given page. This is useful if you want to have some more or less static content that is shared among many pages, such as a footer.

Arguments:

- `placeholder_name`
- `page_lookup` (see *page_lookup* for more information)
- `language` (optional)
- `site` (optional)

Examples:

```
{% show_placeholder "footer" "footer_container_page" %}
{% show_placeholder "content" request.current_page.parent_id %}
{% show_placeholder "teaser" request.current_page.get_root %}
```

show_uncached_placeholder

The same as *show_placeholder*, but the placeholder contents will not be cached or taken from the cache.

Arguments:

- `placeholder_name`
- `page_lookup` (see *page_lookup* for more information)
- `language` (optional)
- `site` (optional)

Example:

```
{% show_uncached_placeholder "footer" "footer_container_page" %}
```

page_lookup

The `page_lookup` argument, passed to several template tags to retrieve a page, can be of any of the following types:

- `str`: interpreted as the `reverse_id` field of the desired page, which can be set in the "Advanced" section when editing a page.
- `int`: interpreted as the primary key (`pk` field) of the desired page
- `dict`: a dictionary containing keyword arguments to find the desired page (for instance: `{'pk': 1}`)
- `Page`: you can also pass a page object directly, in which case there will be no database lookup.

If you know the exact page you are referring to, it is a good idea to use a `reverse_id` (a string used to uniquely name a page) rather than a hard-coded numeric ID in your template. For example, you might have a help page that you want to link to or display parts of on all pages. To do this, you would first open the help page in the admin interface and enter an ID (such as `help`) under the 'Advanced' tab of the form. Then you could use that `reverse_id` with the appropriate template tags:

```
{% show_placeholder "right-column" "help" %}
<a href="{% page_url "help" %}">Help page</a>
```

If you are referring to a page *relative* to the current page, you'll probably have to use a numeric page ID or a page object. For instance, if you want the content of the parent page to display on the current page, you can use:

```
{% show_placeholder "content" request.current_page.parent_id %}
```

Or, suppose you have a placeholder called `teaser` on a page that, unless a content editor has filled it with content specific to the current page, should inherit the content of its root-level ancestor:

```
{% placeholder "teaser" or %}
    {% show_placeholder "teaser" request.current_page.get_root %}
{% endplaceholder %}
```

page_url

Displays the URL of a page in the current language.

Arguments:

- `page_lookup` (see *page_lookup* for more information)
- `language` (optional)
- `site` (optional)
- `as var_name` (version 3.0 or later, optional; page_url can now be used to assign the resulting URL to a context variable `var_name`)

Example:

```
<a href="{% page_url "help" %}">Help page</a>
<a href="{% page_url request.current_page.parent %}">Parent page</a>
```

If a matching page isn't found and `DEBUG` is `True`, an exception will be raised. However, if `DEBUG` is `False`, an exception will not be raised.

New in version 3.0: page_url now supports the `as` argument. When used this way, the tag emits nothing, but sets a variable in the context with the specified name to the resulting value.

When using the `as` argument PageNotFound exceptions are always suppressed, regardless of the setting of `DEBUG` and the tag will simply emit an empty string in these cases.

Example:

```
{# Emit a 'canonical' tag when the page is displayed on an alternate url #}
{% page_url request.current_page as current_url %}{% if current_url and current_url !=␣
↪request.get_full_path %}<link rel="canonical" href="{% page_url request.current_page %}
↪">{% endif %}
```

page_attribute

This template tag is used to display an attribute of the current page in the current language.

Arguments:

- `attribute_name`
- `page_lookup` (optional; see *page_lookup* for more information)

Possible values for `attribute_name` are: `"title"`, `"menu_title"`, `"page_title"`, `"slug"`, `"meta_description"`, `"changed_date"`, `"changed_by"` (note that you can also supply that argument without quotes, but this is deprecated because the argument might also be a template variable).

Example:

```
{% page_attribute "page_title" %}
```

If you supply the optional `page_lookup` argument, you will get the page attribute from the page found by that argument.

Example:

```
{% page_attribute "page_title" "my_page_reverse_id" %}
{% page_attribute "page_title" request.current_page.parent_id %}
{% page_attribute "slug" request.current_page.get_root %}
```

New in version 2.3.2: This template tag supports the `as` argument. With this you can assign the result of the template tag to a new variable that you can use elsewhere in the template.

Example:

```
{% page_attribute "page_title" as title %}
<title>{{ title }}</title>
```

It even can be used in combination with the `page_lookup` argument.

Example:

```
{% page_attribute "page_title" "my_page_reverse_id" as title %}
<a href="/mypage/">{{ title }}</a>
```

New in version 2.4.

render_plugin

This template tag is used to render child plugins of the current plugin and should be used inside plugin templates.

Arguments:

- `plugin`

Plugin needs to be an instance of a plugin model.

Example:

```
{% load cms_tags %}
<div class="multicolumn">
{% for plugin in instance.child_plugin_instances %}
    <div style="width: {{ plugin.width }}00px;">
        {% render_plugin plugin %}
    </div>
{% endfor %}
</div>
```

Normally the children of plugins can be accessed via the `child_plugins` attribute of plugins. Plugins need the `allow_children` attribute to set to *True* for this to be enabled.

New in version 3.0.

render_plugin_block

This template tag acts like the template tag `render_model_block` but with a plugin instead of a model as its target. This is used to link from a block of markup to a plugin's change form in edit/preview mode.

This is useful for user interfaces that have some plugins hidden from display in edit/preview mode, but the CMS author needs to expose a way to edit them. It is also useful for just making duplicate or alternate means of triggering the change form for a plugin.

This would typically be used inside a parent-plugin's render template. In this example code below, there is a parent container plugin which renders a list of child plugins inside a navigation block, then the actual plugin contents inside a `DIV.contentgroup-items` block. In this example, the navigation block is always shown, but the items are only shown once the corresponding navigation element is clicked. Adding this `render_plugin_block` makes it significantly more intuitive to edit a child plugin's content, by double-clicking its navigation item in edit mode.

Arguments:

- `plugin`

Example:

```
{% load cms_tags l10n %}

{% block section_content %}
<div class="contentgroup-container">
  <nav class="contentgroup">
    <div class="inner">
      <ul class="contentgroup-items">{% for child in children %}
      {% if child.enabled %}
        <li class="item{{ forloop.counter0|unlocalize }}">
          {% render_plugin_block child %}
          <a href="#item{{ child.id|unlocalize }}">{{ child.title|safe }}</a>
          {% endrender_plugin_block %}
        </li>{% endif %}
      {% endfor %}
      </ul>
    </div>
  </nav>

  <div class="contentgroup-items">{% for child in children %}
    <div class="contentgroup-item item{{ child.id|unlocalize }}{% if not forloop.
↪counter0 %} active{% endif %}">
      {% render_plugin child  %}
    </div>{% endfor %}
  </div>
</div>
{% endblock %}
```

New in version 3.0.

render_model

`render_model` is the way to add frontend editing to any Django model. It both renders the content of the given attribute of the model instance and makes it clickable to edit the related model.

If the toolbar is not enabled, the value of the attribute is rendered in the template without further action.

If the toolbar is enabled, click to call frontend editing code is added.

By using this template tag you can show and edit page titles as well as fields in standard django models, see *How to enable frontend editing for Page and Django models* for examples and further documentation.

Example:

```
<h1>{% render_model my_model "title" "title,abstract" %}</h1>
```

This will render to:

```
<!-- The content of the H1 is the active area that triggers the frontend editor -->
<h1><cms-plugin class="cms-plugin cms-plugin-myapp-mymodel-title-1">{{ my_model.title }}
↪</cms-plugin></h1>
```

Arguments:

- `instance`: instance of your model in the template
- `attribute`: the name of the attribute you want to show in the template; it can be a context variable name; it's possible to target field, property or callable for the specified model; when used on a page object this argument accepts the special `titles` value which will show the page **title** field, while allowing editing **title**, **menu title** and **page title** fields in the same form;
- `edit_fields` (optional): a comma separated list of fields editable in the popup editor; when template tag is used on a page object this argument accepts the special `changelist` value which allows editing the pages **changelist** (items list);
- `language` (optional): the admin language tab to be linked. Useful only for django-hvad enabled models.
- `filters` (optional): a string containing chained filters to apply to the output content; works the same way as `filter` template tag;
- `view_url` (optional): the name of a URL that will be reversed using the instance `pk` and the `language` as arguments;
- `view_method` (optional): a method name that will return a URL to a view; the method must accept `request` as first parameter.
- `varname` (optional): the template tag output can be saved as a context variable for later use.

Note: By default this template tag escapes the content of the rendered model attribute. This helps prevent a range of security vulnerabilities stemming from HTML, JavaScript, and CSS Code Injection.

To change this behaviour, the project administrator should carefully review each use of this template tag and ensure that all content which is rendered to a page using this template tag is cleansed of any potentially harmful HTML markup, CSS styles or JavaScript.

Once the administrator is satisfied that the content is clean, he or she can add the "safe" filter parameter to the template tag if the content should be rendered without escaping.

Warning: `render_model` is only partially compatible with django-hvad: using it with hvad-translated fields (say {% render_model object 'translated_field' %} return error if the hvad-enabled object does not exists in the current language. As a workaround `render_model_icon` can be used instead.

New in version 3.0.

render_model_block

`render_model_block` is the block-level equivalent of `render_model`:

```
{% render_model_block my_model %}
    <h1>{{ instance.title }}</h1>
    <div class="body">
        {{ instance.date|date:"d F Y" }}
        {{ instance.text }}
    </div>
{% endrender_model_block %}
```

This will render to:

```
<!-- This whole block is the active area that triggers the frontend editor -->
<template class="cms-plugin cms-plugin-start cms-plugin-myapp-mymodel-1"></template>
    <h1>{{ my_model.title }}</h1>
    <div class="body">
        {{ my_model.date|date:"d F Y" }}
        {{ my_model.text }}
    </div>
<template class="cms-plugin cms-plugin-end cms-plugin-myapp-mymodel-1"></template>
```

In the block the `my_model` is aliased as `instance` and every attribute and method is available; also template tags and filters are available in the block.

Warning: If the `{% render_model_block %}` contains template tags or template code that rely on or manipulate context data that the `{% render_model_block %}` also makes use of, you may experience some unexpected effects. Unless you are sure that such conflicts will not occur it is advised to keep the code within a `{% render_model_block %}` as simple and short as possible.

Arguments:

- `instance`: instance of your model in the template
- `edit_fields` (optional): a comma separated list of fields editable in the popup editor; when template tag is used on a page object this argument accepts the special `changelist` value which allows editing the pages **changelist** (items list);
- `language` (optional): the admin language tab to be linked. Useful only for django-hvad enabled models.
- `view_url` (optional): the name of a URL that will be reversed using the instance `pk` and the `language` as arguments;
- `view_method` (optional): a method name that will return a URL to a view; the method must accept `request` as first parameter.
- `varname` (optional): the template tag output can be saved as a context variable for later use.

Note: By default this template tag escapes the content of the rendered model attribute. This helps prevent a range of security vulnerabilities stemming from HTML, JavaScript, and CSS Code Injection.

To change this behaviour, the project administrator should carefully review each use of this template tag and ensure that all content which is rendered to a page using this template tag is cleansed of any potentially harmful HTML markup, CSS styles or JavaScript.

Once the administrator is satisfied that the content is clean, he or she can add the "safe" filter parameter to the template tag if the content should be rendered without escaping.

New in version 3.0.

render_model_icon

`render_model_icon` is intended for use where the relevant object attribute is not available for user interaction (for example, already has a link on it, think of a title in a list of items and the titles are linked to the object detail view); when in edit mode, it renders an **edit** icon, which will trigger the editing change form for the provided fields.

```
<h3><a href="{{ my_model.get_absolute_url }}">{{ my_model.title }}</a> {% render_model_
↪icon my_model %}</h3>
```

It will render to something like:

```
<h3>
    <a href="{{ my_model.get_absolute_url }}">{{ my_model.title }}</a>
    <template class="cms-plugin cms-plugin-start cms-plugin-myapp-mymodel-1 cms-render-
↪model-icon"></template>
        <!-- The image below is the active area that triggers the frontend editor -->
        <img src="/static/cms/img/toolbar/render_model_placeholder.png">
    <template class="cms-plugin cms-plugin-end cms-plugin-myapp-mymodel-1 cms-render-
↪model-icon"></template>
</h3>
```

Note: Icon and position can be customised via CSS by setting a background to the `.cms-render-model-icon img` selector.

Arguments:

- `instance`: instance of your model in the template
- `edit_fields` (optional): a comma separated list of fields editable in the popup editor; when template tag is used on a page object this argument accepts the special `changelist` value which allows editing the pages **changelist** (items list);
- `language` (optional): the admin language tab to be linked. Useful only for django-hvad enabled models.
- `view_url` (optional): the name of a URL that will be reversed using the instance `pk` and the `language` as arguments;
- `view_method` (optional): a method name that will return a URL to a view; the method must accept `request` as first parameter.
- `varname` (optional): the template tag output can be saved as a context variable for later use.

Note: By default this template tag escapes the content of the rendered model attribute. This helps prevent a range of security vulnerabilities stemming from HTML, JavaScript, and CSS Code Injection.

To change this behaviour, the project administrator should carefully review each use of this template tag and ensure that all content which is rendered to a page using this template tag is cleansed of any potentially harmful HTML markup, CSS styles or JavaScript.

Once the administrator is satisfied that the content is clean, he or she can add the "safe" filter parameter to the template tag if the content should be rendered without escaping.

New in version 3.0.

render_model_add

`render_model_add` is similar to `render_model_icon` but it will enable to create instances of the given instance class; when in edit mode, it renders an **add** icon, which will trigger the editing add form for the provided model.

```
<h3><a href="{{ my_model.get_absolute_url }}">{{ my_model.title }}</a> {% render_model_
↪add my_model %}</h3>
```

It will render to something like:

```
<h3>
    <a href="{{ my_model.get_absolute_url }}">{{ my_model.title }}</a>
    <template class="cms-plugin cms-plugin-start cms-plugin-myapp-mymodel-1 cms-render-
↪model-add"></template>
        <!-- The image below is the active area that triggers the frontend editor -->
        <img src="/static/cms/img/toolbar/render_model_placeholder.png">
    <template class="cms-plugin cms-plugin-end cms-plugin-myapp-mymodel-1 cms-render-
↪model-add"></template>
</h3>
```

Note: Icon and position can be customised via CSS by setting a background to the `.cms-render-model-add img` selector.

Arguments:

- `instance`: instance of your model, or model class to be added
- `edit_fields` (optional): a comma separated list of fields editable in the popup editor;
- `language` (optional): the admin language tab to be linked. Useful only for django-hvad enabled models.
- `view_url` (optional): the name of a url that will be reversed using the instance `pk` and the `language` as arguments;
- `view_method` (optional): a method name that will return a URL to a view; the method must accept `request` as first parameter.
- `varname` (optional): the template tag output can be saved as a context variable for later use.

Note: By default this template tag escapes the content of the rendered model attribute. This helps prevent a range of security vulnerabilities stemming from HTML, JavaScript, and CSS Code Injection.

To change this behaviour, the project administrator should carefully review each use of this template tag and ensure that all content which is rendered to a page using this template tag is cleansed of any potentially harmful HTML markup, CSS styles or JavaScript.

Once the administrator is satisfied that the content is clean, he or she can add the "safe" filter parameter to the template tag if the content should be rendered without escaping.

Warning: If passing a class, instead of an instance, and using `view_method`, please bear in mind that the method will be called over an **empty instance** of the class, so attributes are all empty, and the instance does not exists on the database.

New in version 3.1.

render_model_add_block

`render_model_add_block` is similar to `render_model_add` but instead of emitting an icon that is linked to the add model form in a modal dialog, it wraps arbitrary markup with the same "link". This allows the developer to create front-end editing experiences better suited to the project.

All arguments are identical to `render_model_add`, but the template tag is used in two parts to wrap the markup that should be wrapped.

```
{% render_model_add_block my_model_instance %}<div>New Object</div>{% endrender_model_
↪add_block %}
```

It will render to something like:

```
<template class="cms-plugin cms-plugin-start cms-plugin-myapp-mymodel-1 cms-render-model-
↪add"></template>
    <div>New Object</div>
<template class="cms-plugin cms-plugin-end cms-plugin-myapp-mymodel-1 cms-render-model-
↪add"></template>
```

Warning: You **must** pass an *instance* of your model as instance parameter. The instance passed could be an existing models instance, or one newly created in your view/plugin. It does not even have to be saved, it is introspected by the template tag to determine the desired model class.

Arguments:

- `instance`: instance of your model in the template
- `edit_fields` (optional): a comma separated list of fields editable in the popup editor;
- `language` (optional): the admin language tab to be linked. Useful only for django-hvad enabled models.
- `view_url` (optional): the name of a URL that will be reversed using the instance `pk` and the `language` as arguments;
- `view_method` (optional): a method name that will return a URL to a view; the method must accept `request` as first parameter.
- `varname` (optional): the template tag output can be saved as a context variable for later use.

page_language_url

Returns the URL of the current page in an other language:

```
{% page_language_url "de" %}
{% page_language_url "fr" %}
{% page_language_url "en" %}
```

If the current URL has no CMS Page and is handled by a navigation extender and the URL changes based on the language, you will need to set a `language_changer` function with the `set_language_changer` function in `menus.utils`.

For more information, see /topics/i18n.

language_chooser

The `language_chooser` template tag will display a language chooser for the current page. You can modify the template in `menu/language_chooser.html` or provide your own template if necessary.

Example:

```
{% language_chooser %}
```

or with custom template:

```
{% language_chooser "myapp/language_chooser.html" %}
```

The language_chooser has three different modes in which it will display the languages you can choose from: "raw" (default), "native", "current" and "short". It can be passed as the last argument to the `language_chooser tag` as a string. In "raw" mode, the language will be displayed like its verbose name in the settings. In "native" mode the languages are displayed in their actual language (eg. German will be displayed "Deutsch", Japanese as "" etc). In "current" mode the languages are translated into the current language the user is seeing the site in (eg. if the site is displayed in German, Japanese will be displayed as "Japanisch"). "Short" mode takes the language code (eg. "en") to display.

If the current URL has no CMS Page and is handled by a navigation extender and the URL changes based on the language, you will need to set a `language_changer` function with the `set_language_changer` function in `menus.utils`.

For more information, see /topics/i18n.

Toolbar template tags

The `cms_toolbar` template tag is included in the `cms_tags` library and will add the required CSS and javascript to the sekizai blocks in the base template. The template tag must be placed before any `{% placeholder %}` occurrences within your HTML.

Important: `{% cms_toolbar %}` will only work correctly inside the template's <body>.

Example:

```
<body>
{% cms_toolbar %}
{% placeholder "home" %}
...
```

Note: Be aware that you cannot surround the `cms_toolbar` tag with block tags. The toolbar tag will render everything below it to collect all plugins and placeholders, before it renders itself. Block tags interfere with this.

Toolbar

The toolbar can contain various items, some of which in turn can contain other items. These items are represented by the classes listed in `cms.toolbar.items`, and created using the various APIs described below.

Do not instantiate these classes manually

These classes are described here for reference purposes only. It is strongly recommended that you do not create instances yourself, but use the methods listed here.

Classes and methods

Common parameters (`key`, `verbose_name`, `position`, `on_close`, `disabled`, `active`) and options are described at the end of this document.

class `cms.toolbar.toolbar.`**`CMSToolbar`**(*request*, *request_path=None*, *_async=False*)

Bases: `CMSToolbarBase`

`add_ajax_item`(*name*, *action*, *active=False*, *disabled=False*, *extra_classes=None*, *data=None*, *question=None*, *side=<object object>*, *position=None*, *on_success=None*, *method='POST'*)

Adds `AjaxItem` that sends a POST request to `action` with `data`, and returns it. `data` should be `None` or a dictionary. The CSRF token will automatically be added to the item.

If a string is provided for `question`, it will be presented to the user to allow confirmation before the request is sent.

`add_button`(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *extra_wrapper_classes=None*, *side=<object object>*, *position=None*)

Adds a `Button` to the toolbar.

`add_button_list`(*identifier=None*, *extra_classes=None*, *side=<object object>*, *position=None*)

Adds an (empty) `ButtonList` to the toolbar and returns it.

`add_item`(*item*, *position=None*)

Adds an item (which must be a subclass of `BaseItem`), and returns it. This is a low-level API, and you should always use one of the built-in object-specific methods to add items in preference if possible, using this method **only** for custom item classes.

`add_link_item`(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *side=<object object>*, *position=None*)

Adds a `LinkItem` that opens `url`, and returns it.

add_modal_button(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *extra_wrapper_classes=None*, *side=<object object>*, *position=None*, *on_close='REFRESH_PAGE'*)

Adds a `ModalButton` to the toolbar.

add_modal_item(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close='REFRESH_PAGE'*, *side=<object object>*, *position=None*)

Similar to `add_sideframe_item()`, but adds a `ModalItem` that opens the `url` in a modal dialog instead of the sideframe, and returns it.

add_sideframe_button(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *extra_wrapper_classes=None*, *side=<object object>*, *position=None*, *on_close=None*)

Adds a `SideframeButton` to the toolbar.

add_sideframe_item(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close=None*, *side=<object object>*, *position=None*)

Adds a `SideframeItem` that opens `url` in the sideframe and returns it.

find_first(*item_type*, ***attributes*)

Returns the first `ItemSearchResult` that matches the search, or `None`. The search strategy is the same as in `find_items()`. The return value of this method is safe to use as the `position` argument of the various APIs to add items.

find_items(*item_type*, ***attributes*)

Returns a list of `ItemSearchResult` objects matching all items of `item_type` (e.g. `LinkItem`).

get_item_count()

Returns the number of items in the menu.

get_menu(*key*, *verbose_name=None*, *side=<object object>*, *position=None*)

Will return the `Menu` identified with `key`, or `None`.

get_or_create_menu(*key*, *verbose_name=None*, *disabled=False*, *side=<object object>*, *position=None*)

If a `Menu` with `key` already exists, this method will return that menu. Otherwise it will create a menu with the `key` identifier.

populate()

Populates the toolbar with the CMS items.

content_mode_active

`True` if content mode is active.

edit_mode_active

`True` if the structure board editing mode is active.

preview_mode_active

`True` if preview mode is active.

watch_models = []

Property; a list of models that the toolbar *watches for URL changes*, so it can redirect to the new URL on saving.

class cms.toolbar.items.**Menu**(*name*, *csrf_token*, *disabled=False*, *side=<object object>*)

Bases: `SubMenu`

Provides a menu in the toolbar. Use a `CMSToolbar.get_or_create_menu` method to create a `Menu` instance. Can be added to `CMSToolbar`.

add_ajax_item(*name*, *action*, *active=False*, *disabled=False*, *extra_classes=None*, *data=None*, *question=None*, *side=<object object>*, *position=None*, *on_success=None*, *method='POST'*)

Adds `AjaxItem` that sends a POST request to `action` with `data`, and returns it. `data` should be `None` or a dictionary. The CSRF token will automatically be added to the item.

If a string is provided for `question`, it will be presented to the user to allow confirmation before the request is sent.

add_break(*identifier=None*, *position=None*)

Adds a visual break in the menu, at `position`, and returns it. `identifier` may be used to make this item searchable.

add_item(*item*, *position=None*)

Adds an item (which must be a subclass of `BaseItem`), and returns it. This is a low-level API, and you should always use one of the built-in object-specific methods to add items in preference if possible, using this method **only** for custom item classes.

add_link_item(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *side=<object object>*, *position=None*)

Adds a `LinkItem` that opens `url`, and returns it.

add_modal_item(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close='REFRESH_PAGE'*, *side=<object object>*, *position=None*)

Similar to `add_sideframe_item()`, but adds a `ModalItem` that opens the `url` in a modal dialog instead of the sideframe, and returns it.

add_sideframe_item(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close=None*, *side=<object object>*, *position=None*)

Adds a `SideframeItem` that opens `url` in the sideframe and returns it.

find_first(*item_type*, ***attributes*)

Returns the first `ItemSearchResult` that matches the search, or `None`. The search strategy is the same as in `find_items()`. The return value of this method is safe to use as the `position` argument of the various APIs to add items.

find_items(*item_type*, ***attributes*)

Returns a list of `ItemSearchResult` objects matching all items of `item_type` (e.g. `LinkItem`).

get_context()

Returns the context (as dictionary) for this item.

get_item_count()

Returns the number of items in the menu.

get_or_create_menu(*key*, *verbose_name*, *disabled=False*, *side=<object object>*, *position=None*)

Adds a new sub-menu, at `position`, and returns a `SubMenu`.

render()

Renders the item and returns it as a string. By default, calls `get_context()` and renders `template` with the context returned.

template = 'cms/toolbar/items/menu.html'

Must be set by subclasses and point to a Django template

class cms.toolbar.items.**SubMenu**(*name*, *csrf_token*, *disabled=False*, *side=<object object>*)

Bases: `ToolbarAPIMixin`, `BaseItem`

A child of a `Menu`. Use a `Menu.get_or_create_menu` method to create a `SubMenu` instance. Can be added to `Menu`.

add_ajax_item(*name*, *action*, *active=False*, *disabled=False*, *extra_classes=None*, *data=None*, *question=None*, *side=<object object>*, *position=None*, *on_success=None*, *method='POST'*)

Adds *AjaxItem* that sends a POST request to `action` with `data`, and returns it. `data` should be `None` or a dictionary. The CSRF token will automatically be added to the item.

If a string is provided for `question`, it will be presented to the user to allow confirmation before the request is sent.

add_break(*identifier=None*, *position=None*)

Adds a visual break in the menu, at *position*, and returns it. `identifier` may be used to make this item searchable.

add_item(*item*, *position=None*)

Adds an item (which must be a subclass of *BaseItem*), and returns it. This is a low-level API, and you should always use one of the built-in object-specific methods to add items in preference if possible, using this method **only** for custom item classes.

add_link_item(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *side=<object object>*, *position=None*)

Adds a *LinkItem* that opens `url`, and returns it.

add_modal_item(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close='REFRESH_PAGE'*, *side=<object object>*, *position=None*)

Similar to *add_sideframe_item()*, but adds a *ModalItem* that opens the `url` in a modal dialog instead of the sideframe, and returns it.

add_sideframe_item(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close=None*, *side=<object object>*, *position=None*)

Adds a *SideframeItem* that opens `url` in the sideframe and returns it.

find_first(*item_type*, ***attributes*)

Returns the first *ItemSearchResult* that matches the search, or `None`. The search strategy is the same as in *find_items()*. The return value of this method is safe to use as the *position* argument of the various APIs to add items.

find_items(*item_type*, ***attributes*)

Returns a list of *ItemSearchResult* objects matching all items of `item_type` (e.g. `LinkItem`).

get_context()

Returns the context (as dictionary) for this item.

get_item_count()

Returns the number of items in the menu.

render()

Renders the item and returns it as a string. By default, calls *get_context()* and renders *template* with the context returned.

template = 'cms/toolbar/items/menu.html'

Must be set by subclasses and point to a Django template

class cms.toolbar.items.**LinkItem**(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *side=<object object>*)

Bases: *BaseItem*

Sends a GET request. Use an *add_link_item* method to create a `LinkItem` instance. Can be added to *CMSToolbar*, *Menu*, *SubMenu*.

get_context()

Returns the context (as dictionary) for this item.

template = 'cms/toolbar/items/item_link.html'

Must be set by subclasses and point to a Django template

class cms.toolbar.items.**SideframeItem**(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close=None*, *side=<object object>*)

Bases: FrameItem

Sends a GET request; loads response in a sideframe. Use an *add_sideframe_item* method to create a SideframeItem instance. Can be added to *CMSToolbar*, *Menu*, *SubMenu*.

template = 'cms/toolbar/items/item_sideframe.html'

Must be set by subclasses and point to a Django template

class cms.toolbar.items.**ModalItem**(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close=None*, *side=<object object>*)

Bases: FrameItem

Sends a GET request; loads response in a modal window. Use an *add_modal_item* method to create a ModalItem instance. Can be added to *CMSToolbar*, *Menu*, *SubMenu*.

template = 'cms/toolbar/items/item_modal.html'

Must be set by subclasses and point to a Django template

class cms.toolbar.items.**AjaxItem**(*name*, *action*, *csrf_token*, *data=None*, *active=False*, *disabled=False*, *extra_classes=None*, *question=None*, *side=<object object>*, *on_success=None*, *method='POST'*)

Bases: *BaseItem*

Sends a POST request. Use an *add_ajax_item* method to create a AjaxItem instance. Can be added to *CMSToolbar*, *Menu*, *SubMenu*.

get_context()

Returns the context (as dictionary) for this item.

template = 'cms/toolbar/items/item_ajax.html'

Must be set by subclasses and point to a Django template

class cms.toolbar.items.**Break**(*identifier=None*)

Bases: *BaseItem*

A visual break in a menu. Use an *add_break* method to create a Break instance. Can be added to *Menu*, *SubMenu*.

template = 'cms/toolbar/items/break.html'

Must be set by subclasses and point to a Django template

class cms.toolbar.items.**ButtonList**(*identifier=None*, *extra_classes=None*, *side=<object object>*)

Bases: *BaseItem*

A visually-connected list of one or more buttons. Use an *add_button_list()* method to create a ButtonList instance. Can be added to *CMSToolbar*.

add_button(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*)

Adds a *Button* to the list of buttons and returns it.

add_modal_button(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close='REFRESH_PAGE'*)

Adds a *ModalButton* to the button list and returns it.

add_sideframe_button(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close=None*)

Adds a *SideframeButton* to the button list and returns it.

get_buttons()

Yields all buttons in the button list

get_context()

Returns the context (as dictionary) for this item.

template = 'cms/toolbar/items/button_list.html'

Must be set by subclasses and point to a Django template

class cms.toolbar.items.**Button**(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*)

Bases: BaseButton

Sends a GET request. Use a *CMSToolbar.add_button* or *ButtonList.add_button()* method to create a Button instance. Can be added to *CMSToolbar*, *ButtonList*.

class cms.toolbar.items.**SideframeButton**(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close=None*)

Bases: *ModalButton*

Sends a GET request. Use a *CMSToolbar.add_sideframe_button* or *ButtonList.add_sideframe_button()* method to create a SideframeButton instance. Can be added to *CMSToolbar*, *ButtonList*.

class cms.toolbar.items.**ModalButton**(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close=None*)

Bases: *Button*

Sends a GET request. Use a *CMSToolbar.add_modal_button* or *ButtonList.add_modal_button()* method to create a ModalButton instance. Can be added to *CMSToolbar*, *ButtonList*.

class cms.toolbar.items.**BaseItem**(*side=<object object>*)

Bases: object

All toolbar items inherit from BaseItem. If you need to create a custom toolbar item, subclass BaseItem.

get_context()

Returns the context (as dictionary) for this item.

render()

Renders the item and returns it as a string. By default, calls *get_context()* and renders *template* with the context returned.

template = None

Must be set by subclasses and point to a Django template

class cms.toolbar.items.**ToolbarAPIMixin**

Provides APIs used by *CMSToolbar* and *Menu*.

add_ajax_item(*name*, *action*, *active=False*, *disabled=False*, *extra_classes=None*, *data=None*, *question=None*, *side=<object object>*, *position=None*, *on_success=None*, *method='POST'*)

Adds `AjaxItem` that sends a POST request to `action` with `data`, and returns it. `data` should be `None` or a dictionary. The CSRF token will automatically be added to the item.

If a string is provided for `question`, it will be presented to the user to allow confirmation before the request is sent.

add_item(*item*, *position=None*)

Adds an item (which must be a subclass of `BaseItem`), and returns it. This is a low-level API, and you should always use one of the built-in object-specific methods to add items in preference if possible, using this method **only** for custom item classes.

add_link_item(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *side=<object object>*, *position=None*)

Adds a `LinkItem` that opens `url`, and returns it.

add_modal_item(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close='REFRESH_PAGE'*, *side=<object object>*, *position=None*)

Similar to `add_sideframe_item()`, but adds a `ModalItem` that opens the `url` in a modal dialog instead of the sideframe, and returns it.

add_sideframe_item(*name*, *url*, *active=False*, *disabled=False*, *extra_classes=None*, *on_close=None*, *side=<object object>*, *position=None*)

Adds a `SideframeItem` that opens `url` in the sideframe and returns it.

find_first(*item_type*, ***attributes*)

Returns the first `ItemSearchResult` that matches the search, or `None`. The search strategy is the same as in `find_items()`. The return value of this method is safe to use as the `position` argument of the various APIs to add items.

find_items(*item_type*, ***attributes*)

Returns a list of `ItemSearchResult` objects matching all items of `item_type` (e.g. `LinkItem`).

get_item_count()

Returns the number of items in the menu.

class cms.toolbar.items.**ItemSearchResult**(*item*, *index*)

Bases: `object`

Returned by the find APIs in `ToolbarAPIMixin`.

An `ItemSearchResult` will have two useful attributes:

item

The item found.

index

The index of the item (its position amongst the other items).

The `ItemSearchResult` itself can be cast to an integer, and supports addition and subtraction of numbers. See the `position` parameter for more details, and *Control the position of items in the toolbar* for examples.

Parameters

The methods described below for creating/modifying toolbar items share a number of common parameters:

key

a unique identifier (typically a string)

verbose_name

the displayed text in the item

position

The position index of the new item in the list of items. May be:

1. `None` - appends the item to the list
2. an integer - inserts the item at that index in the list
3. an object already in the list - Inserts the item into the list immediately before the object; must be a sub-class of *BaseItem*, and must exist in the list
4. an *ItemSearchResult* - inserts the item into the list immediately before the `ItemSearchResult`. `ItemSearchResult` may be treated as an integer.

on_close:

Determines what happens after closing a frame (sideframe or modal) that has been opened by a menu item. May be:

1. `None` - does nothing when the sideframe closes
2. *REFRESH_PAGE* - refreshes the page when the frame closes
3. a URL - opens the URLS when the frame is closed.

disabled

Greys out the item and renders it inoperable.

active

Applies to buttons only; renders the button it its 'activated' state.

side

Either *cms.constants.LEFT* or *cms.constants.RIGHT* (both unique objects denoted above as <object object>). Decides to which side of the toolbar the item should be added.

django CMS constants used in toolbars

`cms.constants.`**REFRESH_PAGE**

Supplied to `on_close` arguments to refresh the current page when the frame is closed, for example:

```
from cms.constants import REFRESH_PAGE

self.toolbar.add_modal_item(
    'Modal item',
    url=modal_url,
    on_close=REFRESH_PAGE
    )
```

`cms.cms_toolbars.`**ADMIN_MENU_IDENTIFIER**

The *Site* menu (that usually shows the project's domain name, *example.com* by default). `ADMIN_MENU_IDENTIFIER` allows you to get hold of this object easily using *cms.toolbar.toolbar.CMSToolbar.get_menu()*.

`cms.cms_toolbars.LANGUAGE_MENU_IDENTIFIER`

The *Language* menu. `LANGUAGE_MENU_IDENTIFIER` allows you to get hold of this object easily using *cms.toolbar.toolbar.CMSToolbar.get_menu()*.

`cms.cms_toolbars.PAGE_MENU_IDENTIFIER`

The *Page* menu. `PAGE_MENU_IDENTIFIER` allows you to get hold of this object easily using *cms.toolbar.toolbar.CMSToolbar.get_menu()*.

Utility functions

Utility functions provide functionality that is regularly used within the django CMS core and are also available to third party packages.

Model admin

Action buttons

class `cms.admin.utils.ChangeListActionsMixin`

Bases: `object`

ChangeListActionsMixin is a mixin for the ModelAdmin class. It adds the ability to have action buttons and a burger menu in the admin's change list view. Unlike actions that affect multiple listed items the list action buttons only affect one item at a time.

Use `get_action_list()` to register actions and *admin_action_button()* to define the button behavior.

To activate the actions make sure `"admin_list_actions"` is in the admin classes **:prop:`~django.contrib.admin.ModelAdmin.list_display`** property.

static `admin_action_button`(*url: str, icon: str, title: str, burger_menu: bool = False, action: str = 'get', disabled: bool = False, keepsideframe: bool = True, name: str = ''*) → str

Returns a generic button supported by the ChangeListActionsMixin.

Parameters

- **url** (*str*) – Url of the action as string, typically generated by **:func:`~cms.utils.urlutils.admin_reverse`**_
- **icon** (*str*) – Name of the icon shown in the button or before the title in the burger menu.
- **title** (*str*) – Human-readable string describing the action.
- **burger_menu** (*bool*) – If `True` the action item will be part of a burger menu right og all buttons.
- **action** (*str*) – Either `"get"` or `"post"` defining the html method used for the url. Some urls require a post method.
- **disabled** (*bool*) – If `True` the item is grayed out and cannot be selected.
- **keepsideframe** (*bool*) – If `False` the side frame (if open) will be closed before executing the action.
- **name** (*str*) – A string that will be added to the class list of the button/menu item: `cms-action-{{ name }}`

To add an action button to the change list use the following pattern in your admin class:

```
def my_custom_button(self, obj, request, disabled=False):
    # do preparations, e.g., check permissions, get url, ...
    url = admin_reverse("...", args=[obj.pk])
    if permissions_ok:
        return self.admin_action_button(url, "info",  _("View usage"),␣
↪disabled=disabled)
    return ""  # No button
```

get_actions_list() → List[Callable[[Model, HttpRequest], str]]

Collect list actions from implemented methods and return as list. Make sure to call it's `super()` instance when overwriting:

```
class MyModelAdmin(admin.ModelAdmin):
    ...

    def get_actions_list(self):
        return super().get_actions_list() + [self.my_first_action, self.my_
↪second_action]
```

get_admin_list_actions(*request: HttpRequest*) → Callable[[Model], str]

Method to register the admin action menu with the admin's list display

Usage (in your model admin):

```
class MyModelAdmin(AdminActionsMixin, admin.ModelAdmin):
    ...
    list_display = ('name', ..., 'admin_list_actions')
```

Grouper admin

class cms.admin.utils.**GrouperModelAdmin**(*model*, *admin_site*)

Bases: *ChangeListActionsMixin*, `ModelAdmin`

Easy-to-use ModelAdmin for grouper models. Usage example:

```
class MyGrouperAdmin(GrouperModelAdmin):
    # Add language tabs to change and add views
    extra_grouping_fields = ("language",)
    # Add grouper and content fields to change list view
    # Add preview and settings action to change list view
    list_display = ("field_in_grouper_model", "content__field_in_content_model",
↪"admin_list_actions")

    # Automatically add content fields to change form (either the standard form or␣
↪any form given
    form = MyChangeForm

    ...
```

Using `GrouperModelAdmin` instead of `ModelAdmin` adds a view standard functions to your admin class to make it more easily and more consistently customizable.

1. **By adding "admin_list_actions" to the admin's `list_display`**
   attribute the change list view gets an action column as described by *ChangeListActionsMixin*.

2. **The admin class automatically creates a method for each field of the content model form (default: all fields)**
   named `content__{content_model_field_name}`. Those fields can be used in `list_display` just as grouper model fields. Currently, they are not sortable, however.
3. **The change form is amended with exactly those content fields also named `content__{content_model_field_name}`.**
   As a result, the change form can (but does not have to) contain both grouper model fields and content model fields. The admin takes care of creating the necessary model instances.

changeform_view(*request: HttpRequest*, *object_id: Optional[str] = None*, *form_url: str = ''*, *extra_context: dict = None*) → HttpResponse

Update grouping field properties for both add and change views

clear_content_cache() → None

Clear cache, e.g., for a new request

delete_view(*request: HttpRequest*, *object_id: str*, *extra_context: Optional[dict] = None*) → HttpResponse

Update grouping field properties for delete view

get_actions_list() → list

Collect list actions from implemented methods and return as list. Make sure to call it's `super()` instance when overwriting:

```
class MyModelAdmin(admin.ModelAdmin):
    ...

    def get_actions_list(self):
        return super().get_actions_list() + [self.my_first_action, self.my_
↪second_action]
```

get_changelist(*request: HttpRequest*, ***kwargs*) → type

Allow for extra grouping fields as a non-filter parameter

get_changelist_instance(*request: HttpRequest*) → GrouperChangeListBase

Update grouping field properties and get changelist instance

get_content_field(*obj: Model*, *field_name: str*, *request: Optional[HttpRequest] = None*) → Any

Retrieves the content of a field stored in the content model. If request is given extra grouping fields are processed before.

get_extra_context(*request: HttpRequest*, *object_id: Optional[str] = None*) → Dict[str, Any]

Provide the grouping fields to the change view.

get_form(*request: HttpRequest*, *obj: Optional[Model] = None*, ***kwargs*) → type

Adds the language from the request to the form class

get_grouper_obj(*obj: Model*) → Model

Get the admin object. If obj is a content object assume that the admin object resides in the field named after the admin model. The admin model name must be the same as the content model name minus "Content" at the end.

get_grouping_from_request(*request: HttpRequest*) → None

Retrieves the current grouping selectors from the request

get_language() → str

Hook on how to get the current language. By default, Django provides it.

get_language_from_request(*request: HttpRequest*) → str

Hook for get_language_from_request which by default uses the cms utility

get_language_tuple() → Tuple[Tuple[str, str], ...]

Hook on how to get all available languages for the language selector.

get_preserved_filters(*request: HttpRequest*) → str

Always preserve grouping get parameters! Also, add them to changelist filters: * Save and continue will keep the grouping parameters * Save and returning to changelist will keep the grouping parameters

get_queryset(*request: HttpRequest*) → QuerySet

Annotates content fields with the name "content__{field_name}" to the grouper queryset if for all content fields that appear in the

get_readonly_fields(*request: HttpRequest*, *obj: Optional[Model] = None*)

Allow access to content fields to be controlled by a method "can_change_content": This allows versioned content to be protected if needed

history_view(*request: HttpRequest*, *object_id: str*, *extra_context: Optional[dict] = None*) → HttpResponse

Update grouping field properties for history view

save_model(*request: HttpRequest*, *obj: Model*, *form: Form*, *change: bool*) → None

Save/create both grouper and content object

view_on_site(*obj: Model*) → Optional[str]

bool(x) -> bool

Returns True when the argument x is true, False otherwise. The builtins True and False are the only two instances of the class bool. The class bool is a subclass of the class int, and cannot be subclassed.

content_model: Optional[Model] = None

The content model class to be used. Defaults to the model class named like the grouper model class plus `"Content"` at the end from the same app as the grouper model class, e.g., `BlogPostContent` if the grouper is `BlogPost`.

content_related_field: Optional[str] = None

Name of the inverse relation field giving the set of content models belonging to a grouper model. Defaults to the first field found as an inverse relation. If you have more than one inverse relation please make sure to specify this field. An example would be if the blog post content model contained a many-to-many relationship to the grouper model for, say, related blog posts.

property current_content_filters: Dict[str, Any]

Filters needed to get the correct content model instance

extra_grouping_fields: Tuple[str, ...] = ()

Indicates additional grouping fields such as `"language"` for example. Additional grouping fields create tabs in the change form and a dropdown menu in the change list view.

Note: All fields serving as extra grouping fields must be part of the admin's `fieldsets` setting for `GrouperModelAdmin` to work properly. In the change form the fields will be invisible.

---

grouper_field_name: Optional[str] = None

The name of the `ForeignKey` in the content model that points to the grouper instance. If not given it is assumed to be the snake case name of the grouper model class, e.g. `"blog_post"` for the `"BlogPost"` model.

Placeholders

`cms.utils.placeholder.get_placeholder_from_slot(placeholder_relation: Manager, slot: str, template_obj=None) → Placeholder`

Retrieves the placeholder instance for a PlaceholderRelationField either by scanning the template of the template_obj (if given) or by creating or getting a Placeholder in the database

`cms.utils.placeholder.get_declared_placeholders_for_obj(obj)`

Returns declared placeholders for an object. The object is supposed to have a method `get_template` which returns the template path as a string that renders the object. `get_declared_placeholders` returns a list of placeholders used in the template by the `{% placeholder %}` template tag.

Plugins

`cms.utils.plugins.assign_plugins(request, placeholders, template=None, lang=None)`

Fetch all plugins for the given `placeholders` and cast them down to the concrete instances in one query per type.

`cms.utils.plugins.has_reached_plugin_limit(placeholder, plugin_type, language, template=None)`

Checks if placeholder has reached its global plugin limit, if not then it checks if it has reached its plugin_type limit.

`cms.utils.plugins.get_plugin_class(plugin_type: str) → CMSPluginBase`

Returns the plugin class for a given plugin_type (str)

`cms.utils.plugins.get_plugin_model(plugin_type: str) → CMSPlugin`

Returns the plugin model class for a given plugin_type (str)

`cms.utils.plugins.get_plugins_as_layered_tree(plugins)`

Given an iterable of plugins ordered by position, returns a deque of root plugins with their respective children set in the child_plugin_instances attribute.

`cms.utils.plugins.copy_plugins_to_placeholder(plugins, placeholder, language=None, root_plugin=None, start_positions=None)`

Copies an iterable of plugins to a placeholder

Parameters

- **plugins** (*iterable*) – Plugins to be copied
- **placeholder** (*cms.models.pluginmodel.CMSPlugin* instance) – Target placeholder
- **language** (*str*) – target language (if no root plugin is given)
- **root_plugin** –
- **start_positions** (*int*) – Cache for start positions by language

The logic of this method is the following:

1. Get bound plugins for each source plugin
2. Get the parent plugin (if it exists)
3. then get a copy of the source plugin instance
4. Set the id/pk to None to it the id of the generic plugin instance above; this will effectively change the generic plugin created above into a concrete one
5. find the position in the new plalceholder
6. save the concrete plugin (which creates a new plugin in the database)
7. trigger the copy relations
8. return the plugin ids

New in version 3.2.

Content creation wizards

See the *How-to section on wizards* for an introduction to creating wizards.

Wizard classes are sub-classes of `cms.wizards.wizard_base.Wizard`.

Before making a wizard available to the CMS it needs to be instantiated, for example:

```
my_app_wizard = MyAppWizard(
    title="New MyApp",
    weight=200,
    form=MyAppWizardForm,
    description="Create a new MyApp instance",
)
```

When instantiating a Wizard object, use the keywords:

class cms.wizards.wizard_base.**WizardBase**(*title*, *weight*, *form*, *model=None*, *template_name=None*, *description=None*)

title
The title of the wizard. This will appear in a large font size on the wizard "menu"

weight
The "weight" of the wizard when determining the sort-order.

form
The form to use for this wizard. This is mandatory, but can be sub-classed from *django.forms.form* or *django.forms.ModelForm*.

model
If a Form is used above, this keyword argument must be supplied and should contain the model class. This is used to determine the unique wizard "signature" amongst other things.

template_name
An optional template can be supplied.

description
The description is optional, but if it is not supplied, the CMS will create one from the pattern: "Create a new «model.verbose_name» instance."

edit_mode_on_success
Whether the user will get redirected to object edit url after a successful creation or not. This only works if the object is registered for toolbar enabled models.

Important: As of version 4 of django CMS wizards are no longer registered with the `wizard_pool`. Instead you need to create a app config in `cms_config.py` to register wizards.

New in version 4.0.

Wizards are made available to the CMS by adding a `cms.app_base.CMSAppConfig` subclass to your apps's *cms_config.py*. As an example, here's how the CMS itself registers its wizards:

```
class CMSCoreConfig(CMSAppConfig):
    cms_enabled = True  # Use cms core's functionality
    cms_wizards = [cms_page_wizard, cms_subpage_wizard]   # Namely, those wizards
```

For the above example the configuration might look like this:

```
from .cms_wizards import my_app_wizard

class MyAppConfig(CMSAppConfig):
    cms_enabled = True
    cms_wizards = [my_app_wizard]
```

Wizard class

class cms.wizards.wizard_base.**Wizard**(*title*, *weight*, *form*, *model=None*, *template_name=None*, *description=None*)

All wizard classes should inherit from `cms.wizards.wizard_base.Wizard`. This class implements a number of methods that may be overridden as required.

get_description(***kwargs*)

Simply returns the `description` property assigned during instantiation or one derived from the model if description is not provided during instantiation. Override this method if this needs to be determined programmatically.

get_success_url(*obj*, ***kwargs*)

Once the wizard has completed, the user will be redirected to the URL of the new object that was created. By default, this is done by return the result of calling the `get_absolute_url` method on the object. This may then be modified to force the user into edit mode if the wizard property `edit_mode_on_success` is True.

In some cases, the created content will not implement `get_absolute_url` or that redirecting the user is undesirable. In these cases, simply override this method. If `get_success_url` returns `None`, the CMS will just redirect to the current page after the object is created.

Parameters

- **obj** (*object*) – The created object
- **kwargs** (*dict*) – Arbitrary keyword arguments

get_title(***kwargs*)

Simply returns the `title` property assigned during instantiation. Override this method if this needs to be determined programmatically.

get_weight(***kwargs*)

Simply returns the `weight` property assigned during instantiation. Override this method if this needs to be determined programmatically.

user_has_add_permission(*user*, ***kwargs*)

Returns boolean reflecting whether the given «user» has permission to add instances of this wizard's associated model. Can be overridden as required for more complex situations.

Parameters

user – The current user using the wizard.

Returns

True if the user should be able to use this wizard.

property id

To construct a unique ID for each wizard, we start with the module and class name for uniqueness, we hash it because a wizard's ID is displayed in the form's markup, and we'd rather not expose code paths there.

Helpers

`cms.wizards.helpers.get_entry(entry_key)`

Returns a wizard object based on its *id*.

`cms.wizards.helpers.get_entries()`

Returns a list of (wizard.id, wizard) tuples (for all registered wizards) ordered by weight

`get_entries()` is useful if it is required to have a list of all registered wizards. Typically, this is used to iterate over them all. Note that they will be returned in the order of their `weight`: smallest numbers for weight are returned first.:

```
for wizard_id, wizard in get_entries():
    # do something with a wizard...
```

wizard_pool

Warning: The wizard pool is deprecated since version 4.0 and will be removed in a future version.

`cms.wizards.wizard_pool.wizard_pool`

Warning: Deprecated since version 4.0.

Using wizard_pool is deprecated. Use *cms.wizards.helper* functions instead. Since django CMS version 4 wizards are registered with the cms using *cms.app_base.CMSAppConfig* in `cms_config.py`.

class `cms.wizards.wizard_pool.WizardPool`

Deprecated since version 4.0.

`get_entry(entry)`

Deprecated since version 4.0: use *cms.wizards.helpers.get_entry()* instead

Returns the wizard from the pool identified by «entry», which may be a Wizard instance or its "id" (which is the PK of its underlying content-type).

`is_registered(entry, **kwargs)`

Deprecated since version 4.0.

Returns True if the provided entry is registered.

`register(entry)`

Deprecated since version 4.0.

You may notice from the example above that the last line in the sample code is:

```
wizard_pool.register(my_app_wizard)
```

This sort of thing should look very familiar, as a similar approach is used for cms_apps, template tags and even Django's admin.

Calling the wizard pool's `register` method will register the provided wizard into the pool, unless there is already a wizard of the same module and class name. In this case, the register method will raise a `cms.wizards.wizard_pool.AlreadyRegisteredException`.

unregister(*entry*)

Deprecated since version 4.0.

If «entry» is registered into the pool, remove it.

Returns True if the entry was successfully registered, else False.

Icons reusable for plugins

django CMS comes with a set of icons stored in its own icon font. The icons are based on FontAwesome4 and Bootstrap Icons.

They are available in the frontend editor (i.e. if the toolbar is available). To use them on the admin site where all the plugin editing etc. happens, you will have to load them explicitly.

```
from cms.utils.urlutils import static_with_version


class MyAdmin(admin.Admin):
    class Media:
        css = {"all": (static_with_version("cms/cms.icons.css"),)}

    ...
```

Icons are used by adding snippets like this to your templates

```
<span class="cms-icon cms-icon-<iconname>"></span>
```

The following icons are available:

- advanced-settings
- alias
- apphook
- archive
- bin
- comment
- compare
- copy
- cut
- edit
- edit-new
- highlight
- home
- info
- lock
- manage-versions
- moderate

- paste
- plugins
- publish
- redo
- rename
- search
- settings
- sitemap
- undo
- unlock
- unpublish
- view

Example:

```
<span class="cms-icon cms-icon-edit-new me-2"></span>{% translate "Edit new..." %}
```

5.2.5 Release notes & upgrade information

Some versions of django CMS present more complex upgrade paths than others, and some **require** you to take action. It is strongly recommended to read the release notes carefully when upgrading.

It goes without saying that you should **backup your database** before embarking on any process that makes changes to your database.

4.1.0 release notes

December 20, 2022

> **Warning:** Upgrading from previous versions
>
> django CMS 4.1.0 is the **first community release** of django CMS 4. Django CMS 4 introduces changes that **require** action if you are upgrading from a 3.x version. Please read the step-by-step guide to the process of upgrading from 3.5+ to 4 here: *4.0.0 release notes*

Welcome to django CMS 4.1!

These release notes cover the new features, as well as some backwards incompatible changes you'll want to be aware of when upgrading from django CMS 4.0. If you are upgrading from django CMS 3.11 or earlier please urgently read the release notes of django CMS 4.0.

Django and Python compatibility

django CMS supports **Django 3.2 to 5.0**. We highly recommend and only support the latest release of each series.

It supports **Python 3.8, 3.9, 3.10, and 3.11**. As for Django we highly recommend and only support the latest release of each series.

What's new in 4.1

Status indicators in page tree

- Status indicators are shown in the page tree. For django CMS core only two states are available: public and empty.
- Django CMS core provides hooks to allow other packages to patch the status indicators, e.g., djangocms-versioning.
- Djangocms-versioning will add more functionality to the indicators (e.g., publish from page tree).

Bug Fixes

- In rare cases moving plugins from one placeholder to another could result in a server error and an inconsistent plugin tree.
- Empty page contents (e.g., due to a missing translation of a page) will now render correctly in the page tree.
- Adding a page will trigger the form in the language viewd not in the browser language
- The "Empty all" menus for placeholders now works.

Backward incompatible changes in 4.1

TitleExtension

`TitleExtension` in `cms.extensions.models` has been renamed to `PageContentExtension` to keep a consistent language in the page models.

Any packages using `TitleExtension` will need to adapt the name change in their code base.

In `ExtensionToolbar` the method `get_title_extension_admin(language=None)` has been deprecated. It is recommended to switch to the new `get_page_content_extension_admin(page_content=None)`.

Monkey patching

This is a purely internal change: django CMS v4.1 does not support monkey patching as for djangocms-versioning before version 2.0. Please only use djangocms-versioning >= 2.0

Miscellaneous

- The Django setting `SEND_BROKEN_LINK_EMAILS` (removed from Django since version 1.8) was used as a signal to send an email to the site managers if `page_url` could not reverse the url name. Since this version the outdated setting is ignored. If managers want to receive mails add `django.middleware.common.BrokenLinkEmailsMiddleware` to the project's `settings.MIDDLEWARE`.
- `cms.api.create_title` has been renamed to *`create_page_content`*. A compatibility shim remains and issues a deprecation warning.
- `cms.models.pluginmodel.CMSPlugin.copy_plugin` was removed.

4.0.0 release notes

Note: Version 4.1 is the first **community release of django CMS 4**. It includes all of the changes mentioned in this section and those mentioned in *4.1.0 release notes*. django CMS 3 users seeking to upgrade **should immediately go to version 4.1**.

Version 4.0 has never been released on pypi but is available on github.

This release of django CMS is a complete rewrite of the core, hugely simplifying what django-cms does out of the box. The main reasons for the changes:

- Limitations with publishing, where only 2 versions can ever exist
- Too many "opinions" of how parts of the CMS should work baked in

> **Warning:** Upgrading from previous versions
>
> 4.0.0 introduces some changes that **require** action if you are upgrading from a previous version. Please read below for a step-by-step guide to the process of upgrading from 3.5+ to 4.0.0

The core principles of django-cms 4.0+

- The CMS core such be simplified
- The core should not force any opinions
- The app registry, plugin and wizard pools should be simplified and allow easy registration
- Allow third parties to define how publishing should work, if anyone needs the feature to work differently they can. This is why publishing was moved to djangocms-versioning.

How to upgrade to 4.0.0

It is currently recommended to start new projects on django-cms 4.0.0. The changes from django-cms 3.x to 4.x are so different that only 3rd party utilities can assist with the migration such as *djangocms-4-migration* https://pypi.org/project/djangocms-4-migration/.

Please refer to the guidance within the aforementioned package to perform a migration between projects.

What's new in 4.0.0

New features at a glance

- A revised model structure, delivering huge performance improvements
- Powerful versioning functionality
- A new app configuration facility that allows other apps to customise / control other apps by enhancing features.
- Dedicated Edit, Preview and Structure endpoints. Allows the editing interface to be used by custom models and not just pages.
- New and improved plugin architecture
- New Alias Placeholders that are versioned and provide more control (replaces Static placeholders)

Improvements and new features

Do we comment on changes that have already happened in previous v3 versions, such as Github actions etc??

- Feat Added pre-migrate hook to check version 4 is intentional (https://github.com/django-cms/django-cms/commit/ff6cb9b5dced92eadef62694e989d601e9475b30)
- Feat Added live-url querystring parameter option for PageContent edit and preview endpoints (https://github.com/django-cms/django-cms/commit/ee89fe4f44fb0675bbdb85a2804de5328450a184)
- Fix Structure mode disappearing from the toolbar (https://github.com/django-cms/django-cms/commit/7dafe846a94e50e96e29f0d8909fc25f43cbcaab)
- Fix pagetree and status alignment (https://github.com/django-cms/django-cms/commit/914558d283c197b4035ae7e1a084860f486c9429)
- Feat Upgrade the FE bundle to Node 16 (https://github.com/django-cms/django-cms/commit/f110ddb25083a19263508ccbecfb0c692204245a)
- Feat Allow showing the toolbar for anonymous users (https://github.com/django-cms/django-cms/commit/2008ca8a85eaf5f875d37c2fbca6ce03b2c7b2d8)
- Ported Django 3.2 support (https://github.com/django-cms/django-cms/commit/b0deaedd7d5e11086d10799445b3cd6df47c11a4)
- Ported Django 3.1 support (https://github.com/django-cms/django-cms/commit/fb0d4f235b3b80610356e9a0c89fb361ea5e27c5)
- Ported Django 3.0 support (https://github.com/django-cms/django-cms/commit/c44b6beda941b29cf964c2a2fe28f012d9b6c83f)
- Ported Split database packages so that tests can be run with sqlite (https://github.com/django-cms/django-cms/commit/c77b5e08a1cd2074789cbe461392bc7ac01e11d6)
- Fix being able to reset the setting PageContent.limit_visibility_in_menu (https://github.com/django-cms/django-cms/commit/66c70394c9e144281a0b47d93e3784d06318acf9)
- Ported Replace Travis CI with Github actions (https://github.com/django-cms/django-cms/commit/29ae26eafa0abf4ec27160ba59d890e4497043f6)
- Feat Add CMSAppExtension.ready which is called after all cms app configs are loaded (https://github.com/django-cms/django-cms/commit/c02308fc52610eaeec9ea6b663c89b08614e4317)
- Feat Deprecate the core Alias plugin (https://github.com/django-cms/django-cms/commit/0fec81224889a94bdb7fce6c9f1da2fb7c886ec8)

- Feat Replace deprecated Jquery .load() call with .on('load', … (https://github.com/django-cms/django-cms/commit/c9cd9fbf26804f74b4df884ae67e8f90603af583)
- Feat Refactor *page.get_title_cache* to be more straightforward (https://github.com/django-cms/django-cms/commit/80911296bba8d263f5150cb481e925cdf307a363)
- Feat Added Prevent JS injection in the admin add plugin url (https://github.com/django-cms/django-cms/commit/72025947d8d3757977f0efab75bda70504a3b6c4)
- Ported Fix 'urls.W001' warning with custom apphook urls (https://github.com/django-cms/django-cms/commit/75978fb1c3ad25d1efba39a5d32215314358ba71)
- Ported Override urlconf_module so that Django system checks don't crash (https://github.com/django-cms/django-cms/commit/f1226a57b767d4b9f66a0cfec4374b5157c49e4e)
- Feat Added raise a 404 when EmptyPageContent is returned (https://github.com/django-cms/django-cms/commit/8e7cdb12d20e63e552ea2cc010f586c3dfbb396a)
- Feat Added the ability to disable the sideframe with the setting *CMS_SIDEFRAME_ENABLED* (https://github.com/django-cms/django-cms/commit/a1ac04d3f81777f6404af62a9c31ff74715b7028)
- Feat Added dedicated edit and preview toolbar buttons (https://github.com/django-cms/django-cms/commit/5005cd933e12332e9296cdda3e0a9eeaea3fc9a2)
- Feat Added expose the sideframe in CMS.API (https://github.com/django-cms/django-cms/commit/4dadf9f1e1f2cf4da6bc68f8367236b040255fbc)
- Feat Removed resolve View (https://github.com/django-cms/django-cms/commit/e3a23a7fc757892c7d58e4af6b78e853ddecab87)
- Feat Removed resolve Page (https://github.com/django-cms/django-cms/commit/0e885ca9e27367c7154cb33406725ac3b67eb170)
- Feat Added toolbar persist setting *CMS_TOOLBAR_URL__PERSIST* (https://github.com/django-cms/django-cms/commit/fb27c34e2a4aebd2e10e1262ef1c43b69c79a132)
- Feat Added front end editing and rendering registry (https://github.com/django-cms/django-cms/commit/db4ff4162cf4ecd36caa8bba066ec28f75b472d8)
- Feat Added Placeholder checks framework (https://github.com/django-cms/django-cms/commit/53171cf2ba7e6aaeca6b2a86df6ad3ffde80e965)
- Feat Registered PageContent with the django admin (https://github.com/django-cms/django-cms/commit/2e090d6c2fd9768f1e8e871dfa9f17ddb2154f7a)
- Feat Added a new source field to PageContent to the Placeholder model (https://github.com/django-cms/django-cms/commit/b075f44d3384b765c74a55947b82ba3c885b0bb1)
- Feat Renamed the Title model to PageContent (https://github.com/django-cms/django-cms/commit/2894ae8bcf92092d947a097499c01ab2bbb0e6df)
- Feat create_page API warning added for no longer accepting a published argument (https://github.com/django-cms/django-cms/commit/f48b8698f239881cc4ca0d593ecae20628486a04)
- Feat Dedicated Edit and Preview endpoints (https://github.com/django-cms/django-cms/commit/bf1af91bf5cc6dba4b19b476201f398cf58e768f, https://github.com/django-cms/django-cms/commit/685361d475fc4718bf0b1e3444a27be8505a7390, https://github.com/django-cms/django-cms/commit/0f12156c8ed85914d4e3b14b30bce87becefe92b, https://github.com/django-cms/django-cms/commit/39562aeb9e61d5d3c08b1031757be11bc5934dff)
- Feat Refactored the plugin tree, replacing django-treebeard with custom CTE queries (https://github.com/django-cms/django-cms/commit/83d38dbb2e51b4cb65aff5726a1c415de7a1c376, https:

//github.com/django-cms/django-cms/commit/4dfaa1c360c2a15f6572b89fc994a254be9e961d, https://github.com/django-cms/django-cms/commit/90bb064fa794c3cc3decd547dc9ddcc5cb89d100)

- Feat Registered the Placeholder model with the django admin (https://github.com/django-cms/django-cms/commit/5a1c89316f3b58c92910520000d87dbe37b3132a)
- Feat Removed Placeholder content fallbacks (https://github.com/django-cms/django-cms/commit/a9947fed11275bae833d1efdee3e8fa4bc1e0eaf)
- Feat Added Generic Foreignkey to Placeholder model (https://github.com/django-cms/django-cms/commit/0aedfbbd1a1eafb750607a3d0f784fcf118c9532)
- Feat Removed publisher_publish management command (https://github.com/django-cms/django-cms/commit/cb19c60697bbd042b973f7df88f85d2b2a22753b)
- Feat Placeholders moved from Page to the Title model (https://github.com/django-cms/django-cms/commit/37082d074a4e37a9d2114c4236d526529daa1219, https://github.com/django-cms/django-cms/commit/d7e2d26a6c7c6991a8edf2883092ddff6b87c0aa)
- Feat Wizards integrated into the app registration system (https://github.com/django-cms/django-cms/commit/c8f56a969b30b70a8795fc5c15a0aa70b2fe1ae9)
- Feat Page and Placeholder signals rewritten to group Page and Placeholder plugin operations (https://github.com/django-cms/django-cms/commit/03941533670ee9f8c5c078bda8e5cfdd9a639f53, https://github.com/django-cms/django-cms/commit/ca16415b1022c984ce0525336beafacfed14bb31)
- Feat Added new cms app registration and configuration system (https://github.com/django-cms/django-cms/commit/97515c81da2d883055098c0a5c3d033629ea5b15)
- Feat Removed publishing from the core (https://github.com/django-cms/django-cms/commit/41c4ab0dc72e2a3015cd789657924ade09797f0a, https://github.com/django-cms/django-cms/commit/14110d06779399ee90631dc45c21fa419fbeeb9f, https://github.com/django-cms/django-cms/commit/cf442f756f41d0447def9cd2a2bb41d7b8a53cf3, https://github.com/django-cms/django-cms/commit/9905ca6ec986942f3acc692d10deabbc0ca5768d, https://github.com/django-cms/django-cms/commit/1d789468403f50301e413856a925b15f020a71b1, https://github.com/django-cms/django-cms/commit/9f25075455595b11a75ae5574aa4a7ad0c791670)

Bug Fixes

Removal of deprecated functionality

- Removed *Page.get_draft()*
- Removed *Page.get_published()*
- Removed *StaticPlaceholders*

Main differences to django CMS 3.x

The main differences to note in the core CMS which is now extremely simplified are:

- No concept of publishing, removed because it was limited to just draft and live. An opinionated implementation is now accomplished through djangocms_versioning. Many new concepts exist in this application. The reason that the publishing is external is due to the fact that it is an opinionated implementation. If it is agreed as the way forward by the community it could potentially be brought in as an internal app that compliments the core codebase, similar to how Django is organised internally.
- CMS app config, allows other apps to customise / control other apps by enabling or disabling features.

- Dedicated Edit, Preview and Structure endpoints, this allows any applications using Placeholders inside or outside of the CMS (djangocms_alias) to use the same editing experience.
- New plugin architecture, simplified and no reliance on treebeard which was problematic in the past.
- Static placeholders are being replaced by djangocms_alias because static placeholders cannot be versioned or allow moderation.

Model changes

Page, Title (now PageContent) and Placeholder refactor

There are various changes to the model structure for the Page and PageContents (formerly Title). The most notable is the fact that plugins from different Title instances were all saved in the same Placeholder instance. This has now changed in DjangoCMS 4, a PageContent (formerly Title) instance now contains a dedicated set of Placeholder instances.

The model structure was changed to allow flexibility in the core of the cms, this allowed a package such as djangocms-versioning to create infinite PageContent models.

Data model of CMS < 4

- **Page (x1 for Draft and x1 for Live)**
  - Title Language: "EN"
  - Title Language: "DE"
  - Placeholder Slot: "header"
  - **Placeholder Slot: "contents"**
    - Plugin 1 Language "EN"
    - Plugin 2 Language "DE"

Data model of CMS >= 4

- **Page**
  - **PageContents Language: "EN"**
    - Placeholder Slot: "header"
    - **Placeholder Slot: "contents"**
      - Plugin 1 Language "EN"
  - **PageContents Language: "DE"**
    - Placeholder Slot: "header"
    - **Placeholder Slot: "contents"**
      - Plugin 2 Language "DE"

Page, PageContents (Title) and Placeholder relation refactor: https://github.com/django-cms/django-cms/commit/37082d074a4e37a9d2114c4236d526529daa1219

Moving Title to PageContent

The model structure was changed to allow the core of the cms to be flexible and un-opinionated.

To handle the fact that the Title model is renamed in the CMS you will need to import the PageContent model.

For a djangocms 4.0 only project:

```
from cms.models import PageContent
```

For a djangocms 3.x and 4.0 compatible project:

```
# To handle the fact that the Title model is renamed in the CMS you will need to import␣
↪the PageContent model.
try:
    from cms.models import PageContent
# django CMS 3.x
except ImportError:
    from cms.models import Title as PageContent
```

For a djangocms 4.x+ only project:

```
from cms.models import PageContent
```

Settings

New or changed settings added.

CMS_TOOLBAR_ANONYMOUS_ON

default
`False`

This setting controls if anonymous users can see the CMS toolbar with a login button when `?toolbat_on` is appended to a URL. The default behaviour is to not show the toolbar to anonymous users.

CMS_TOOLBAR_URL__ENABLE

default
`toolbar_on`

This setting is used to force the toolbar to show on a page.

CMS_TOOLBAR_URL__DISABLE

default
`toolbar_off`

This setting is used to force the toolbar to be hidden on a page.

App registration

https://github.com/django-cms/django-cms/pull/6421 app registration docs in the description of the PR

- Add-ons now make use of a new config system; this is to be migrated to all pools. Add-ons can now define whether they support other addons (such as versioning) as well as provide configuration. This is useful in telling features like versioning how to version an add-on.
- Previously all add-ons would manage their own pool, now it is moving to an app registry based system that will allow centralised control. Although all new add-ons should implement this system the new system will not be depreciated at this time.
- CMSApp is an existing term from v2.5, it is how apphooks are declared in the newer versions of the cms.
- CMSAPPConfig is a class, which defines the configuration for a specific add-on, this is then passed to CMSAppExtension. It provides a way of telling the core that an app wants to access something from another app config (the centralized way of handling app config). For example: Alias wants to tell versioning to version it. This requires two components, versioning must define CMSAppExtension, all it needs to do is implement one method, called *configure_app*, which takes an instance of the CMSAppConfig. In order for an alias app to be linked to it set *app_name_enabled=True*. When the extension is configured like this the cms will take all the config settings and pass them to the relevant extension, specify models that need to be versioned and which apps need to access this config. CMSAppExtension is the way to register the add-ons and in the future plugins (or plugin_pools) with have their configs defined in CMSAPPConfig.

App configuration example

An application that defines an app extension can be used by other apps by registering as "enabled" in the CMSAppConfig by adding: "package_with_extension_enabled":

```
# A package that defines an app extension for other apps to register with
# myapp/cms_config.py
class MyappCMSExtension(CMSAppExtension):
    def __init__(self):
        self.mylist = []

    def configure_app(self, cms_config):
        if hasattr(cms_config, "myapp_attribute"):
            self.mylist.append(cms_config.myapp_attribute)


# A package that defines a value to add to the extension
# someotherapp/cms_config.py
class SomeotherappCMSConfig(CMSAppConfig):
    # By enabling the someotherapp with myapp, the extension will be used for the␣
↪someotherapp
    myapp_enabled = True
```

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```
    # Supply a value to `myapp_attribute` to be added to the myapp cms_config.mylist␣
↪attribute.
    myapp_attribute = "A string value"
```

App configuration usage examples in djangocms-url-manager and djangocms-alias

It is configurable in v4 so you can have another Content Type that you want to work with url manager. here is an example of how url does this for the cms Page, shows you the power of the cms config: https://github.com/django-cms/djangocms-url-manager/blob/acffbeedd3950b9d91f971e7a190b2789d2fe9d9/djangocms_url_manager/cms_config.py#L14

If you had a new Content Type and a new application , you can add the config entry in your third party application and url manager would start to use your model.

Here is an example of djangocms-alias configuring itself for versioning: https://github.com/django-cms/djangocms-alias/blob/7d90b7763278ff74ebe49f70420ecb9f0e2dc4c6/djangocms_alias/cms_config.py#L26 versioning knows nothing about Alias, Alias tells versioning how to use it. No more other apps embedding logic. Obviously Page is configured in url manager by default because it depends on django-cms.

Publishing has been moved to djangocms-versioning

- There is no longer the concept of publishing baked into the core of the CMS. By default any content changes are instantly live with no option to unpublish other than to remove altogether.
- To enable publishing the package djangocms-versioning or other similar package that is Django CMS 4.0+ compatible should be installed.
- The reason that publishing was removed from the core is because the solution baked in made a lot of assumptions that enforced various limitations on developers. By not providing a publishing method it allows developers to provide their own solutions to the publishing paradigm.
- Goal is to migrate the monkey patching of versioning into the core to allow a "simple" mode in djangocms-versioning that replaces the 3.x draft/live mode when installing (default option).

See here for the djangocms-versioning documentation.

djangocms-versioning overrides queries from PageContent

- django CMS Versioning overrides the standard query manager for PageContent by adding the query manager: PublishedContentManagerMixin. https://github.com/django-cms/djangocms-versioning/blob/429e50d4de6d14f1088cbdba2be63b20c2885be9/djangocms_versioning/managers.py#L4
- By default only published versions are returned from *PageContents.objects.all()*.

To get all versions regardless of versioning state you can use the "_base_manager":
***PageContent._base_manager.all()*::**

Get only published PageContents PageContent.objects.all()

Get all PageContents regardless of the versioning status, be careful with this as it can return archived, draft and published versions! PageContent._base_manager.all()

Get only draft PageContents from djangcms-versioning.constants import DRAFT PageContent._base_manager.filter(versions__state=DRAFT)

Disabling the admin sideframe

- The CMS sideframe in the Django admin caused many issues when navigating through different plugins admin views, the experience it offered left the user confused at the page they were currently on after making various changes, it was also buggy at times. Disable the sideframe by adding the following setting in the settings.py file, it is enabled by default. CMS_SIDEFRAME_ENABLED = False

Plugin refactor

- Plugins used to utilise Treebeard. The Treebeard implementation was not coping with this, it was prone to breakage and tree corruption. The refactor simplifies and avoids this by utilising a parent child relationship with plugins. The main issue when replacing the Treebeard implementation was performance, here the standard Django ORM could not provide the query complexity and performance required, individual implementations for the different SQL dialects was implemented to aid performance of plugin queries.
- Initial plugin refactor: https://github.com/django-cms/django-cms/commit/83d38dbb2e51b4cb65aff5726a1c415de7a1c376
- Support for other SQL dialects for the plugin tree structure: https://github.com/django-cms/django-cms/commit/4dfaa1c360c2a15f6572b89fc994a254be9e961d

Signals

Page signals have been merged into pre_obj and post_obj signals for operations on Page. Publishing signals have been removed as of DjangoCMS 4.0 but are available in djangocms-versioning: https://github.com/django-cms/django-cms/commit/03941533670ee9f8c5c078bda8e5cfdd9a639f53

Log Operations

Previously the logs created were inconsistent and were not created for all page and placeholder operations. Now all page and placeholder operations are logged in the Django Admin model LogEntry. The logs can also be triggered by external apps via using the signals provided in the CMS. https://github.com/django-cms/django-cms/commit/03941533670ee9f8c5c078bda8e5cfdd9a639f53

Placeholder Admin

The placeholder is now responsible for the edit, structure and preview endpoints. This was previously taken care of by appending *?edit*, *?structure* and *?preview*, This change was made to allow objects that weren't pages to be viewed and edited in their own way (Alias is an example of this).

- The views to render the endpoints: render_object_structure, render_object_edit, render_object_preview located at: https://github.com/django-cms/django-cms/blob/release/4.0.x/cms/views.py#L195 The endpoint is determined by using a reverse look up to the registered admin instance using the toolbar utils: (get_object_preview_url, get_object_structure_url, get_object_edit_url) https://github.com/django-cms/django-cms/blob/release/4.0.x/cms/toolbar/utils.py#L122 This is due to the addition of versioning. Previously every add-on was responsible for their edit end points which made it impossible for versioning to bring the correct end point for a specific version. You need to specify cms_toolbar_enabled_models attribute, which is a list of tuples in the following format: (model, render function). model - model you want to be editable
- render function - a function that takes django.http.HttpRequest object and an object of the model specified above, and returns a django.http.HttpResponse (or any subclass, like TemplateResponse) object based on provided data. Please note that the preview/edit endpoint has changed. Appending ?edit no longer works. There's a separate

endpoint for editing (that the toolbar is aware of and links to when clicking Edit button). One also needs to include *cms_enabled = True* in the cms config, otherwise that cms_toolbar_enabled_models config won't be passed to the cms.

- PlaceholderAdminMixin is deprecated and has a deprecation notice that it will be removed in the next major release: CMS 5.0. https://github.com/django-cms/django-cms/blob/release/4.0.x/cms/admin/placeholderadmin.py#L178

Placeholder relations

The *PlaceholderField* has been replaced by the *PlaceholderRelationField*, the built-in migrations will automatically take care of the replacement, but it can't however replace the code.

You need to replace your fields such as:

```
class Post(models.Model):
    ...
    media = PlaceholderField("media", related_name="media")
```

with:

```
class Post(models.Model):
    ...
    placeholders = PlaceholderRelationField()
```

The above you may think is very strange, and you are completely correct. This is because the placeholder relationship is now a GenericForeignKey relationship, so it can handle many different placeholders at once.

To be able to use *media* again, we can create a property like the below example:

```
class Post(models.Model):
    ...
    def _get_placeholder_from_slotname(self, slotname):
        try:
            return self.placeholders.get(slot=slotname)
        except Placeholder.DoesNotExist:
            from cms.utils.placeholder import rescan_placeholders_for_obj
            rescan_placeholders_for_obj(self)
            return self.placeholders.get(slot=slotname)

    @cached_property
    def media(self):
        return self._get_placeholder_from_slotname("media")
```

Placeholder endpoints

The Placeholder endpoints are designed in a way that allows other third party packages to reuse the edit and preview modes. The major benefit of the reuse is that a third party package can use the views to manage plugins.

Preview end-point

The preview endpoint replaces what was the *?preview* feature in django-cms 3.x

To generate a preview url you can reuse the following snippet, replacing my_page_content_instance with an instance of PageContent:

```
from cms.toolbar.utils import get_object_preview_url

edit_url = get_object_preview_url(my_page_content_instance)
```

Edit end-point

The edit endpoint replaces what was the *?edit* feature in django-cms 3.x

To generate an edit url you can reuse the following snippet, replacing my_page_content_instance with an instance of PageContent:

```
from cms.toolbar.utils import get_object_edit_url

edit_url = get_object_edit_url(my_page_content_instance)
```

Structure end-point

The structure endpoint is a endpoint used by the plugin sidebar used when viewing the edit endpoint. It's where the plugins are rendered and can be dragged & dropped, added and removed.

Configuring you application to use Placeholder endpoint

We can use djangocms-alias as an example here because this is a very good example of a package that "reuses" the django-cms placeholder endpoints.

Your app should have a placeholder field, djangocms-alias adds this manually. The core CMS has a more advanced technique of adding placeholders by the templates, for django-cms alias we only need one placeholder. Please refer to how the core django-cms package implements this for PageContent if you need more advanced control of Placeholder creation.

It is important that your app uses the concept for djangocms-versioning of a grouper and content model:

```
# models.py

class AliasContent(models.Model):
    ...
    placeholders = PlaceholderRelationField()
    placeholder_slotname = 'content'
```

Within your packages cms_config add the following entry:

```
# cms_config.py

class AliasCMSConfig(CMSAppConfig):
```

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```
    cms_enabled = True
    cms_toolbar_enabled_models = [(AliasContent, render_alias_content)]
```

Static Placeholders

Static Placeholders have been superseded by djangocms-alias, because they cannot be versioned.

3.11.1 release notes

This release focuses on support for django 4 and dark mode.

What's new in 3.11.1

Features:

- add Python 3.11 support for Django CMS (#7422) (3fe1449e6) – Vinit Kumar
- Support for Django 4.1 (#7404) (777864af3) – Fabian Braun
- Add support for tel: and mailto: URIs in Advanced Page Settings redirect field (#7370) (0fd058ed3) – Mark Walker
- Improved dutch translations – Stefan van den Eertwegh

Bug Fixes:

- Prefer titles matching request language (#7144) (06c9a85df) – Micah Denbraver
- Adds a deprecation warning for SEND_BROKEN_LINK_EMAILS (#7420) (d38f4a1cc) – Fabian Braun
- Added deprecation warning to *get_current_language()* (#7410) (2788f75e6) – Mark Walker
- CMS check management command fixed [#7412] (#7413) (dcf394bd5) – ton77v
- Changing color scheme resets session settings to defaults (#7407) (fcfe77f63) – Fabian Braun
- Clear page permission cache on page create (#6866) (e59c179dd) – G3RB3N
- Unlocalize page and node ids when rendering the page tree in the admin (#7188) (9e3c57946) – Marco Bonetti
- Allow partially overriding CMS_CACHE_DURATIONS (#7339) (162ff8dd8) – Qijia Liu
- CMS check management command fixed [#7386] (cdcf260aa) – Marco Bonetti
- default light mode (#7381) (abc6e6c5b) – viliammihalik
- Added language to page cache key (#7354) (d5a9f49e6) – Mark Walker

Refactoring and Cleanups:

- Move js API functions to CMS.Helpers to make them available also to the admin site (#7384) (a7f8cd44f) – Fabian Braun

Statistics:

This release includes 40 pull requests, and was created with the help of the following contributors (in alphabetical order):

- Cage Johnson (1 pull request)
- Christian Clauss (1 pull request)
- Dapo Adedire (1 pull request)
- Fabian Braun (11 pull requests)
- G3RB3N (1 pull request)
- Hussein Srour (1 pull request)
- Marco Bonetti (2 pull requests)
- Mark Walker (10 pull requests)
- Micah Denbraver (1 pull request)
- Qijia Liu (1 pull request)
- Shivan Sivakumaran (1 pull request)
- Vinit Kumar (1 pull request)
- code-review-doctor (1 pull request)
- dependabot[bot] (0 pull request)
- ton77v (1 pull request)
- viliammihalik (1 pull request)
- wesleysima (1 pull request)

With the review help of the following contributors:

- Christian Clauss
- Conrad
- Fabian Braun
- Florian Delizy
- Marco Bonetti
- Mark Walker
- Pankrat
- Patrick Mazulo
- Simon Krull
- Vinit Kumar
- dependabot[bot]

- jefe

Thanks to all contributors for their efforts!

How to upgrade to

We assume you are upgrading from django CMS 3.11.0.

Please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Check your settings of *CMS_LANGUAGES* (if used), as it was ignored by default in preceding versions. For more information, please see: https://github.com/django-cms/django-cms/pull/6795

Then run:

```
python manage.py migrate  # to ensure that your database is up-to-date with migrations
python manage.py cms fix-tree
```

Check custom code and third-party applications for use of deprecated or removed functionality or APIs (see above). Some third-party components may need to be updated.

Install the new version of django CMS from GitHub or via pip.

Run:

```
python manage.py migrate
```

to apply the new migrations.

3.11.0 release notes

This release focuses on support for django 4 and dark mode.

What's new in 3.11.0

Features:

- Add pre commit functionality (#7204) (d1ecb6359) – Mark Walker
- Run workflows in concurrency groups (#7211) (04e843337) – Mark Walker
- Added concurrency option to github workflows (#7205) (546b36827) – Mark Walker
- Add support for django 4 (#7268) (9e8eb17) – Vinit Kumar
- Make Plugin Confirm Template configurable (#7267) (bab1e6e) – Jacob Rief
- Add support for dark mode for toolbar, page tree, structure tree, modals (#7245) (b2d9a08) – Fabian Braun

Bug Fixes:

- release script version number (#7322) (8ffc6488d) – Mark Walker
- add support for custom user model in cms permission signals (#7281) (c10b8ffc3) – Vinit Kumar
- publishing static placeholders outside of CMS (#7253) (bdb50b650) – Adrien Delhorme
- Toolbar bug in 3.10 (#7232) (b12d07989) – Mark Walker
- Disable workflow concurrency to bring stability back to the CI (#7209) (fdad05756) – Mark Walker

How to upgrade to 3.11.0

We assume you are upgrading from django CMS 3.10.0.

Please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Check your settings of *CMS_LANGUAGES* (if used), as it was ignored by default in preceding versions. For more information, please see: https://github.com/django-cms/django-cms/pull/6795

Then run:

```
python manage.py migrate  # to ensure that your database is up-to-date with migrations
python manage.py cms fix-tree
```

Check custom code and third-party applications for use of deprecated or removed functionality or APIs (see above). Some third-party components may need to be updated.

Install the new version of django CMS from GitHub or via pip.

Run:

```
python manage.py migrate
```

to apply the new migrations.

3.10.1 release notes

This release focuses on Python 3.10, node 16 (for build system), and bug fixes.

What's new in 3.10.1

Features:

- Add support for Django 3.2 LTS version
- Page changed_date added to the Page tree admin actions dropdown template #6701 (#7046) (73cbbdb00) – Vladimir Kuvandjiev
- Allow recursive template extending in placeholders (#6564) (fed6fe54d) – Stefan Wehrmeyer
- Added ability to set placeholder global limit on children only (#6847) (18e146495) – G3RB3N
- Replaced Travis.CI with Github Actions (#7000) (0f33b5839) – Vinit Kumar
- Added support for Github Actions based CI.

- Added Support for testing frontend, docs, test and linting in different/parallel CI pipelines.
- Added django-treebeard 4.5.1 support, previously pinned django-treebeard<4.5 to avoid breaking changes introduced
- Improved performance of `cms list plugins` command
- Page changed date added to the Page tree admin actions dropdown

Bug Fixes:

- using .nvmrc to target the right nvm version (3e5227def) – Florian Delizy
- Fixed an issue where the wrong page title was returned (#6466) (3a0c4d26e) – Alexandre Joly
- Add toolbar fix for broken CMS in the release 3.10.x – Vinit Kumar
- Fixed #6413: migrations 0019 and 0020 on multi db setups (#6708) (826d57f0f) – Petr Glotov
- Added fix to migrations to handle multi database routing (#6721) (98658a909) – Michael Anckaert
- Fixed issue where default fallbacks is not used when it's an empty list (#6795) (5d21fa5eb) – Arjan de Pooter
- Fixed prefix_default_language = False redirect behavior (#6851) (34a26bd1b) – Radek Stępień
- Fix not checking slug uniqueness on page move (#6958) (5976d393a) – Iacopo Spalletti
- Fixed DontUsePageAttributeWarning message (#6734) (45383888e) – carmenkow
- Fixed Cache not invalidated when using a PlaceholderField outside the CMS #6912 (#6956) (3ce63d7d3) – Benjamin PIERRE
- Fixed unexpected behavior get_page_from_request (#6974) (#6073) (52f926e0d) – Yuriy Mamaev
- Fixed django treebeard 4.5.1 compatibility (#6988) (eeb86fd70) – Aiky30
- Fixed bad Title.path in Multilanguage sites if parent slug is created or modified (#6968) (6e7b0ae48) – fp4code
- Fixed redirect issues when i18n_patterns had prefix_default_language = False
- Fixed not checking slug uniqueness when moving a page
- Fixed builds on RTD
- Fixed the cache not being invalidated when updating a PlaceholderField in a custom model
- Fixed 66622 bad Title.path in multilingual sites when parent slug is created or modified
- Fixed 6973 bag with unexpected behavior `get_page_from_request`
- Fixed migrations with multiple databases
- Fix styles issues, caused by switching to the `display: flex` on the page tree renderer.
- Fixed missing builtin arguments on main `cms` management command causing it to crash
- Fixed template label nested translation
- Fixed a bug where the fallback page title would be returned instead of the one from the current language
- Fixed an issue when running migrations on a multi database project

How to upgrade to 3.10.1

We assume you are upgrading from django CMS 3.10.0.

Please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Check your settings of *CMS_LANGUAGES* (if used), as it was ignored by default in preceding versions. For more information, please see: https://github.com/django-cms/django-cms/pull/6795

Then run:

```
python manage.py migrate  # to ensure that your database is up-to-date with migrations
python manage.py cms fix-tree
```

Check custom code and third-party applications for use of deprecated or removed functionality or APIs (see above). Some third-party components may need to be updated.

Install the new version of django CMS from GitHub or via pip.

Run:

```
python manage.py migrate
```

to apply the new migrations.

3.10.0 release notes

This release focuses on Python 3.10, node 16 (for build system), and bug fixes.

What's new in 3.10.0

Features:

- Add support for Django 3.2 LTS version
- Page changed_date added to the Page tree admin actions dropdown template #6701 (#7046) (73cbbdb00) – Vladimir Kuvandjiev
- Allow recursive template extending in placeholders (#6564) (fed6fe54d) – Stefan Wehrmeyer
- Added ability to set placeholder global limit on children only (#6847) (18e146495) – G3RB3N
- Replaced Travis.CI with Github Actions (#7000) (0f33b5839) – Vinit Kumar
- Added support for Github Actions based CI.
- Added Support for testing frontend, docs, test and linting in different/parallel CI pipelines.
- Added django-treebeard 4.5.1 support, previously pinned django-treebeard<4.5 to avoid breaking changes introduced
- Improved performance of `cms list plugins` command
- Page changed date added to the Page tree admin actions dropdown

Bug Fixes:

- using .nvmrc to target the right nvm version (3e5227def) – Florian Delizy
- Fixed an issue where the wrong page title was returned (#6466) (3a0c4d26e) – Alexandre Joly
- Add toolbar fix for broken CMS in the release 3.10.x – Vinit Kumar
- Fixed #6413: migrations 0019 and 0020 on multi db setups (#6708) (826d57f0f) – Petr Glotov
- Added fix to migrations to handle multi database routing (#6721) (98658a909) – Michael Anckaert
- Fixed issue where default fallbacks is not used when it's an empty list (#6795) (5d21fa5eb) – Arjan de Pooter
- Fixed prefix_default_language = False redirect behavior (#6851) (34a26bd1b) – Radek Stępień
- Fix not checking slug uniqueness on page move (#6958) (5976d393a) – Iacopo Spalletti
- Fixed DontUsePageAttributeWarning message (#6734) (45383888e) – carmenkow
- Fixed Cache not invalidated when using a PlaceholderField outside the CMS #6912 (#6956) (3ce63d7d3) – Benjamin PIERRE
- Fixed unexpected behavior get_page_from_request (#6974) (#6073) (52f926e0d) – Yuriy Mamaev
- Fixed django treebeard 4.5.1 compatibility (#6988) (eeb86fd70) – Aiky30
- Fixed Bad Title.path in Multilanguage sites if parent slug is created or modified (#6968) (6e7b0ae48) – fp4code
- Fixed redirect issues when i18n_patterns had prefix_default_language = False
- Fixed not checking slug uniqueness when moving a page
- Fixed builds on RTD
- Fixed the cache not being invalidated when updating a PlaceholderField in a custom model
- Fixed 66622 bad Title.path in multilingual sites when parent slug is created or modified
- Fixed 6973 bag with unexpected behavior `get_page_from_request`
- Fixed migrations with multiple databases
- Fix styles issues, caused by switching to the `display: flex` on the page tree renderer.
- Fixed missing builtin arguments on main `cms` management command causing it to crash
- Fixed template label nested translation
- Fixed a bug where the fallback page title would be returned instead of the one from the current language
- Fixed an issue when running migrations on a multi database project

How to upgrade to 3.10.0

We assume you are upgrading from django CMS 3.9.0.

Please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Check your settings of *CMS_LANGUAGES* (if used), as it was ignored by default in preceding versions. For more information, please see: https://github.com/django-cms/django-cms/pull/6795

Then run:

```
python manage.py migrate  # to ensure that your database is up-to-date with migrations
python manage.py cms fix-tree
```

Check custom code and third-party applications for use of deprecated or removed functionality or APIs (see above). Some third-party components may need to be updated.

Install the new version of django CMS from GitHub or via pip.

Run:

```
python manage.py migrate
```

to apply the new migrations.

3.9.0 release notes

This release of django CMS (first community driven release) introduces support for Django 3.2, and bugfix. We tried to catch up with as many long waited feature/bugfix requests as possible.

What's new in 3.9.0

Features:

- Add support for Django 3.2 LTS version
- Page changed_date added to the Page tree admin actions dropdown template #6701 (#7046) (73cbbdb00) – Vladimir Kuvandjiev
- Allow recursive template extending in placeholders (#6564) (fed6fe54d) – Stefan Wehrmeyer
- Added ability to set placeholder global limit on children only (#6847) (18e146495) – G3RB3N
- Replaced Travis.CI with Github Actions (#7000) (0f33b5839) – Vinit Kumar
- Added support for Github Actions based CI.
- Added Support for testing frontend, docs, test and linting in different/parallel CI pipelines.
- Added django-treebeard 4.5.1 support, previously pinned django-treebeard<4.5 to avoid breaking changes introduced
- Improved performance of `cms list plugins` command
- Page changed date added to the Page tree admin actions dropdown

Bug Fixes:

- Fixed an issue where the wrong page title was returned (#6466) (3a0c4d26e) – Alexandre Joly
- Fixed #6413: migrations 0019 and 0020 on multi db setups (#6708) (826d57f0f) – Petr Glotov
- Added fix to migrations to handle multi database routing (#6721) (98658a909) – Michael Anckaert
- Fixed issue where default fallbacks is not used when it's an empty list (#6795) (5d21fa5eb) – Arjan de Pooter
- Fixed prefix_default_language = False redirect behavior (#6851) (34a26bd1b) – Radek Stępień
- Fix not checking slug uniqueness on page move (#6958) (5976d393a) – Iacopo Spalletti

- Fixed DontUsePageAttributeWarning message (#6734) (45383888e) – carmenkow
- Fixed Cache not invalidated when using a PlaceholderField outside the CMS #6912 (#6956) (3ce63d7d3) – Benjamin PIERRE
- Fixed unexpected behavior get_page_from_request (#6974) (#6073) (52f926e0d) – Yuriy Mamaev
- Fixed django treebeard 4.5.1 compatibility (#6988) (eeb86fd70) – Aiky30
- Fixed Bad Title.path in Multilanguage sites if parent slug is created or modified (#6968) (6e7b0ae48) – fp4code
- Fixed redirect issues when i18n_patterns had prefix_default_language = False
- Fixed not checking slug uniqueness when moving a page
- Fixed builds on RTD
- Fixed the cache not being invalidated when updating a PlaceholderField in a custom model
- Fixed 66622 bad Title.path in multilingual sites when parent slug is created or modified
- Fixed 6973 bag with unexpected behavior `get_page_from_request`
- Fixed migrations with multiple databases
- Fix styles issues, caused by switching to the `display: flex` on the page tree renderer.
- Fixed missing builtin arguments on main `cms` management command causing it to crash
- Fixed template label nested translation
- Fixed a bug where the fallback page title would be returned instead of the one from the current language
- Fixed an issue when running migrations on a multi database project

How to upgrade to 3.9.0

We assume you are upgrading from django CMS 3.8.

Please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Check your settings of *CMS_LANGUAGES* (if used), as it was ignored by default in preceding versions. For more information, please see: https://github.com/django-cms/django-cms/pull/6795

Then run:

```
python manage.py migrate  # to ensure that your database is up-to-date with migrations
python manage.py cms fix-tree
```

Check custom code and third-party applications for use of deprecated or removed functionality or APIs (see above). Some third-party components may need to be updated.

Install the new version of django CMS from GitHub or via pip.

Run:

```
python manage.py migrate
```

to apply the new migrations.

3.8.0 release notes

This release of django CMS concentrates on introducing support for Django 3.1 and dropps support for Python 2.7 and 3.4. It also removes support for Django versions below 2.2.

What's new in 3.8.0

Improvements and new features

- Introduced Django 3.1 support.
- Dropped support for Python 2.7 and Python 3.4
- Dropped support for Django < 2.2

Bug Fixes

- Removed `djangocms-column` from the manual installation instructions
- Removed duplicate `attr` declaration from the documentation
- Fixed a reference to a wrong variable in log messages in `utils/conf.py`
- Fixed an issue in `wizards/create.html` where the error message did not use the plural form

How to upgrade to 3.8

We assume you are upgrading from django CMS 3.7.

Please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Then run:

```
python manage.py migrate  # to ensure that your database is up-to-date with migrations
python manage.py cms fix-tree
```

Check custom code and third-party applications for use of deprecated or removed functionality or APIs (see above). Some third-party components may need to be updated.

Install the new version of django CMS from GitHub or via pip.

Run:

```
python manage.py migrate
```

to apply the new migrations.

3.7.4 release notes

What's new in 3.7.4

Bug Fixes

- Fixed a security vulnerability in the plugin_type url parameter to insert JavaScript code.

3.7.3 release notes

What's new in 3.7.3

Bug Fixes

- Fixed apphooks config select in Firefox
- Fixed compatibility errors on python 2
- Fixed long page titles in Page tree/list view to prevent horizontal scrolling

3.7.2 release notes

What's new in 3.7.2

Bug Fixes

- migrated from `django.utils.six` to the six package
- migrated from `django.utils.lru_cache` to `functools.lru_cache`
- migrated from `render_to_response` to `render` in `cms.views`
- added `cms.utils.compat.dj.available_attrs`
- added `--force-color` and `--skip-checks` in base commands when using Django 3
- replaced `staticfiles` and `admin_static` with `static`
- replaced djangocms-helper with django-app-helper

Improvements and new features

- Added support for Django 3.0
- Added support for Python 3.8

How to upgrade to 3.7.2

Django 3.0 changed the default behaviour of the `XFrameOptionsMiddleware` from `SAMEORIGIN` to `DENY`. In order for django CMS to function, `X_FRAME_OPTIONS` needs to be set to `SAMEORIGIN` in the `settings.py`:

```
X_FRAME_OPTIONS = 'SAMEORIGIN'
```

3.7.1 release notes

What's new in 3.7.1

Bug Fixes

- Fixed a bug where creating a page via the `cms.api.create_page` ignores left/right positions.
- Fixed documentation example for `urls.py` when using multiple languages.
- Fixed a bug where `request.current_page` would always be the public page, regardless of the toolbar status (draft / live). This only affected custom urls from an apphook.
- Fixed a bug where the menu would render draft pages even if the page on the request was a public page. This happens when a user without change permissions requests edit mode.
- Fixed the 'urls.W001' warning with custom apphook urls
- Fixed missing `{% trans %}` to toolbar shortcuts.
- Fixed a simple typo in the docstring for `cms.utils.helpers.normalize_name`.

Improvements and new features

- Added code of conduct reference file to the root directory
- Moved contributing file to the root directory
- Added better templates for new issue requests
- Mark public static placeholder dirty when published.
- Prevent non-staff users to login with the django CMS toolbar
- Improved and simplified permissions documentation.
- Improved apphooks documentation.
- Improved CMSPluginBase documentation.
- Improved documentation related to nested plugins.
- Updated installation tutorial.
- Updated branch and release policy.

3.7.0 release notes

This release of django CMS concentrates on introducing support for Django 2.2 LTS and Python 3.7.

What's new in 3.7.0

Improvements and new features

- Introduced Django 2.2 support.
- Introduced Python 3.7 support.
- Fixed test suite.
- Fixed override `urlconf_module` so that Django system checks don't crash.

How to upgrade to 3.7

We assume you are upgrading from django CMS 3.6.

Please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Then run:

```
python manage.py migrate  # to ensure that your database is up-to-date with migrations
python manage.py cms fix-tree
```

Check custom code and third-party applications for use of deprecated or removed functionality or APIs (see above). Some third-party components may need to be updated.

Install the new version of django CMS from GitHub or via pip.

Run:

```
python manage.py migrate
```

to apply the new migrations.

Create a new django CMS 3.7 project

On the Divio Cloud

The Divio Cloud offers an easy way to set up django CMS projects. In the Divio Cloud Control Panel, create a new django CMS project and **Deploy** it.

Using the django CMS Installer

Note: The django CMS Installer is not yet available for django CMS 3.6 or Django 2 or later.

This section will be updated or removed before the final release of django CMS 3.6.

Contributors to this release

- Daniele Procida
- Vadim Sikora
- Paulo Alvarado
- Bartosz Płóciennik
- Katie McLaughlin
- Krzysztof Socha
- Mateusz Kamycki
- Sergey Fedoseev
- Aliaksei Urbanski
- heppstux
- Chematronix
- Frank
- Jacob Rief
- Julz
- Angelo Dini

3.6.1 release notes

What's new in 3.6.1

Bug Fixes

- Fixed a security vulnerability in the plugin_type url parameter to insert JavaScript code.

3.6.0 release notes

This release of django CMS concentrates on introducing support for Django 2.0 and Django 2.1, and dropping support for Django versions lower than 1.11.

What's new in 3.6.0

Improvements and new features

- introduced support for Django 2.0
- introduced support for Django 2.1
- removed support for Django versions older than 1.11
- added `page_title` parameter for `cms.api.create_page()` and `cms.api.create_title()`
- length restriction for `Title.meta_description` was moved from model to form; field length was increased to 320 characters.

Removal of deprecated functionality

Previously deprecated functionality has been removed:

- Signal handlers for `Page`, `Title`, `Placeholder` and `CMSPlugin` models was removed.
- Removed the `cms moderator` command.
- Removed the translatable content `get/set` methods from `CMSPlugin` model.

How to upgrade to 3.6

We assume you are upgrading from django CMS 3.5.

Please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Then run:

```
python manage.py migrate  # to ensure that your database is up-to-date with migrations
python manage.py cms fix-tree
```

Check custom code and third-party applications for use of deprecated or removed functionality or APIs (see above). Some third-party components may need to be updated.

Install the new version of django CMS from GitHub or via pip.

Run:

```
python manage.py migrate
```

to apply the new migrations.

Create a new django CMS 3.6 project

On the Divio Cloud

The Divio Cloud offers an easy way to set up django CMS projects. In the Divio Cloud Control Panel, create a new django CMS project and **Deploy** it.

Using the django CMS Installer

Note: The django CMS Installer is not yet available for django CMS 3.6 or Django 2 or later.

This section will be updated or removed before the final release of django CMS 3.6.

Contributors to this release

- Daniele Procida
- Vadim Sikora
- Paulo Alvarado
- Bartosz Płóciennik
- Katie McLaughlin
- Krzysztof Socha
- Mateusz Kamycki
- Sergey Fedoseev
- Aliaksei Urbanski
- heppstux
- Chematronix
- Frank
- Jacob Rief
- Julz

3.5.4 release notes

What's new in 3.5.4

Bug Fixes

- Fixed a security vulnerability in the plugin_type url parameter to insert JavaScript code.

3.5.3 release notes

What's new in 3.5.3

Bug Fixes

- Fixed `TreeNode.DoesNotExist` exception raised when exporting and loading database contents via `dumpdata` and `loaddata`.
- Fixed a bug where `request.current_page` would always be the public page, regardless of the toolbar status (draft / live). This only affected custom urls from an apphook.
- Removed extra quotation mark from the sideframe button template
- Fixed a bug where structureboard tried to preload markup when using legacy renderer
- Fixed a bug where updates on other tab are not correctly propagated if the operation was to move a plugin in the top level of same placeholder
- Fixed a bug where xframe options were processed by clickjacking middleware when page was served from cache, rather then get this value from cache
- Fixed a bug where cached page permissions overrides global permissions
- Fixed a bug where plugins that are not rendered in content wouldn't be editable in structure board
- Fixed a bug with expanding static placeholder by clicking on "Expand All" button
- Fixed a bug where descendant pages with a custom url would lose the overwritten url on save.
- Fixed a bug where setting the `on_delete` option on `PlaceholderField` and `PageField` fields would be ignored.
- Fixed a bug when deleting a modal from changelist inside a modal

3.5.2 release notes

What's new in 3.5.2

Bug Fixes

- Fixed a bug where short-cuts menu entry would stop working after toolbar reload
- Fixed a race condition in frontend code that could lead to sideframe being opened with blank page
- Fixed a bug where the direct children of the homepage would get a leading `/` character when the homepage was moved or published.
- Fixed a bug where non-staff user would be able to open empty structure board
- Fixed a bug where a static file from Django admin was referenced that no longer existed in Django 1.9 and up.
- Fixed a bug where the migration 0018 would fail under certain databases.

3.5.1 release notes

What's new in 3.5.1

Bug Fixes

- Fixed a bug where editing pages with primary keys greater than 999 would throw an exception.
- Fixed a `MultipleObjectsReturned` exception raised on the page types migration with multiple page types per site.
- Fixed a bug which prevented toolbar js from working correctly when rendered before toolbar.
- Fixed a bug where CMS would incorrectly highlight plugin content when plugin contains invisible elements
- Fixed a regression where templates which inherit from a template using an `{% extends %}` tag with a default would raise an exception.

3.5.0 release notes

This release of django CMS concentrates on usability and user-experience, by improving its responsiveness while performing editing operations, particularly those that involve updates to plugin trees.

It also continues our move to decouple logical layers in the system. Most significant in this release is the new separation of the structure board from page rendering, which allows the structure board to be updated without requiring the page to be re-rendered. This vastly speeds up page editing, especially when dealing with complex plugin structures.

Another significant example is that the Page model has been decoupled from the site navigation hierarchy. The navigation tree now exists independently, offering further speed advantages, as well as future benefits for development and extensibility.

Our work to improve separation of concerns can also be seen in the renaming of publishing controls, so that they no longer refer to specifically to pages. Ultimately, publishing actions could apply to any kind of content, and this is a step in that direction.

What's new in 3.5.0

Improvements and new features

- structure board now decoupled from page rendering
- `Page` model decoupled from the site navigation
- Page copy between sites
- better behaviour of the language chooser for published/unpublished languages
- improved handling, refactored code for language fallbacks
- improved repr for `Page`, `Title`, `Placeholder` and `CMSPlugin` models
- generic publishing controls no longer refer to "page"
- improved documentation

Bug Fixes

This release fixes:

- a Page template settings permission issue (failed to check for "Change advanced settings permission")
- a bug allowing Pages to be pasted without the correct translations for the target site
- a bug that prevented users from seeing the welcome screen when debug is off
- a bug allowing aliased plugins to render even if their host page was unpublished
- a bug where focusing inputs in modal would require two clicks in some browsers
- minor issues with initialisation of interface widgets.
- minor clipboard bugs

Removal of deprecated functionality

Previously deprecated functionality has been removed:

- Menu modules can no longer be named `menus.py` (use `cms_menus.py`).
- The `cms.utils.django_load.py` module has been removed (in favour of standard Django helpers)
- Support for Django Reversion has been removed.
- The `urls` and `menus` attributes are no longer supported on `CMSApp` (apphook) classes. All apphook subclasses now need a `get_urls()` method. In addition, if your apphook has a `menus` attribute, that will need to be replaced by a `get_menus()` method.
- `Page.revision_id` has been removed
- Deprecated content creation wizard settings have been removed.

Backward-incompatible changes

- The home page is no longer automatically the root page in the tree (since there is no longer a page tree). Instead, the home page is set manually in the page list admin.
- Previously, ordered pages could be obtained via `Page.object.order_by('path')`; the equivalent is now `Page.object.order_by('node__path')`.
- Pages are no longer ordered by path. For ordering, use `order_by('node__path')`.
- Pages no longer have a `site` field. Whereas previously you could use `filter(site=id)`, now use `filter(node__site==id)`.
- Pages no longer have a `parent` field. Instead a `parent` property now returns the new `parent_page` attribute, which relies on the node tree.
- Never-published pages can no longer have a 'pending' publishing state. A data migration, `cms/migrations/0018_pagenode.py`, removes this.
- Using `self.request.path` or `self.request.path_info` in a `CMSToolbar` subclass method is no longer reliable and is discouraged. Instead, use `self.toolbar.request_path`.

How to upgrade to 3.5

We assume you are upgrading from django CMS 3.4.

Please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Then run:

```
python manage.py migrate  # to ensure that your database is up-to-date with migrations
python manage.py cms fix-tree
```

Check custom code and third-party applications for use of deprecated or removed functionality or APIs (see above). Some third-party components may need to be updated.

Install the new version of django CMS from GitHub.

Run:

```
python manage.py migrate
```

to apply the new migrations.

Create a new django CMS 3.5 project

On the Divio Cloud

The Divio Cloud offers an easy way to set up django CMS projects. In the Divio Cloud Control Panel, create a new django CMS project and **Deploy** it.

Using the django CMS Installer

See our *installation guide in the tutorial*. However, make sure that you:

- have installed the latest version of django CMS Installer (at least version `0.9.8`)
- specify the version to install as `develop`: `djangocms --cms-version=develop mysite`

The user name and password will both be `admin`.

Contributors to this release

- Alexander Paramonov
- Andras Gyömrey
- Daniele Procida
- Gianluca Guarini
- Iacopo Spalletti
- Jacob Rief
- Jens Diemer
- Júlio R. Lucchese

- Leon Smith
- Ludwig Hähne
- Mark Walker
- Nicolas PASCAL
- Nina Zakharenko
- Paulo Alvarado
- Robert Stein
- Salmanul Farzy
- Sergey Fedoseev
- Shaun Brady
- Stefan Foulis
- Tim Graham
- Vadim Sikora
- alskgj

3.4.7 release notes

What's new in 3.4.7

Bug Fixes

- Removed extra quotation mark from the sideframe button template
- Fixed a bug where xframe options were processed by clickjacking middleware when page was served from cache, rather then get this value from cache
- Fixed a bug where cached page permissions overrides global permissions
- Fixed a bug where editing pages with primary keys greater than 9999 would throw an exception.
- Fixed broken wizard page creation when no language is set within the template context (see #5828).
- Fixed a security vulnerability in the plugin_type url parameter to insert JavaScript code.

3.4.6 release notes

What's new in 3.4.6

Bug Fixes

- Changed the way drag and drop works in the page tree. The page has to be selected first before moving.
- Fixed a bug where the cms alias plugin leaks context into the rendered aliased plugins.
- Fixed a bug where users without the "Change advanced settings" permission could still change a page's template.
- Added `on_delete` to `ForeignKey` and `OneToOneField` to silence Django deprecation warnings.

- Fixed a bug where the sitemap would ignore the `public` setting of the site languages and thus display hidden languages.
- Fixed an `AttributeError` raised when adding or removing apphooks in Django 1.11.
- Fixed an `InconsistentMigrationHistory` error raised when the contenttypes app has a pending migration after the user has applied the `0010_migrate_use_structure` migration.

3.4.5 release notes

This version of django CMS is the first to introduce compatibility with Django 1.11, itself also a Long-Term Support release.

What's new in 3.4.5

Bug Fixes

- Fixed a bug where slug wouldn't be generated in the creation wizard
- Fixed a bug where the add page endpoint rendered `Change page` as the html title.
- Fixed an issue where non-staff users could request the wizard create endpoint.
- Fixed an issue where the `Edit page` toolbar button wouldn't show on non-cms pages with placeholders.
- Fixed a bug where placeholder inheritance wouldn't work if the inherited placeholder is cached in an ancestor page.
- Fixed a regression where the code following a `{% placeholder x or %}` declaration, was rendered before attempting to inherit content from parent pages.
- Changed page/placeholder cache keys to use sha1 hash instead of md5 to be FIPS compliant.
- Fixed a bug where the change of a slug would not propagate to all descendant pages
- Fixed a `ValueError` raised when using `ManifestStaticFilesStorage` or similar for static files. This only affects Django >= 1.10

Improvements and new features

- Introduced Django 1.11 compatibility

3.4.4 release notes

What's new in 3.4.4

Bug Fixes

Improvements and new features

Deprecations

Backward incompatible changes

Page methods

The following methods have been removed from the `Page` model:

- `reset_to_live` This internal method was removed and replaced with `revert_to_live`.

Placeholder utilities

Because of a performance issue with placeholder inheritance, we've altered the return value for the following internal placeholder utility functions:

- `cms.utils.placeholder._scan_placeholders` This will now return a list of `Placeholder` tag instances instead of a list of placeholder slot names. You can get the slot name by calling the `get_name()` method on the `Placeholder` tag instance.
- `cms.utils.placeholder.get_placeholders` This will now return a list of `DeclaredPlaceholder` instances instead of a list of placeholder slot names. You can get the slot name by accessing the `slot` attribute on the `DeclaredPlaceholder` instance.

3.4.3 release notes

What's new in 3.4.3

Security Fixes

- Fixed a security vulnerability in the page redirect field which allowed users to insert JavaScript code.
- Fixed a security vulnerability where the `next` parameter for the toolbar login was not sanitised and could point to another domain.

Thanks

Thanks to Mark Walker and Anthony Steinhauser for reporting the security issues.

3.4.2 release notes

django CMS 3.4.2 introduces two key new features: *Revert to live* for pages, and support for Django 1.10

Revert to live is in fact being reintroduced in a new form following a complete rewrite of our revision handling system, that was removed in *django CMS 3.4* to make possible a greatly-improved new implementation from scratch.

Revert to live is the first step in fully re-implementing revision management on a new basis.

The full set of changes is listed below.

What's new in 3.4.2

Bug Fixes

- Escaped strings in `close_frame` JS template.
- Fixed a bug with *text-transform* styles on inputs affecting CMS login
- Fixed a typo in the confirmation message for copying plugins from a different language
- Fixed a bug which prevented certain migrations from running in a multi-db setup.
- Fixed a regression which prevented the `Page` model from rendering correctly when used in a `raw_id_field`.
- Fixed a regression which caused the CMS to cache the toolbar when `CMS_PAGE_CACHE` was set to `True` and an anonymous user had `cms_edit` set to `True` on their session.
- Fixed a regression which prevented users from overriding content in an inherited placeholder.
- Fixed a bug affecting Firefox for Macintosh users, in which use of the Command key later followed by Return would trigger a plugin save.
- Fixed a bug where template inheritance setting creates spurious migration (see #3479)
- Fixed a bug which prevented the page from being marked as dirty (pending changes) when changing the value of the overwrite url field.
- Fixed a bug where the page tree would not update correctly when a sibling page was moved from left to right or right to left.

Improvements and new features

- Added official support for Django 1.10.
- Rewrote manual installation how-to documentation
- Re-introduced the "Revert to live" menu option.
- Added support for django-reversion >= 2 (see #5830)
- Improved the `fix-tree` command so that it also fixes non-root nodes (pages).
- Introduced placeholder operation signals.

Deprecations

- Removed the deprecated `add_url()`, `edit_url()`, `move_url()`, `delete_url()`, `copy_url()` properties of CMSPlugin model.
- Added a deprecation warning to method `render_plugin()` in class `CMSPlugin`.
- Deprecated `frontend_edit_template` attribute of `CMSPluginBase`.
- The `post_` methods in `` `PlaceholderAdminMixin `` have been deprecated in favour of placeholder operation signals.

Other changes

- Adjusted Ajax calls triggered when performing a placeholder operation (add plugin, etc..) to include a GET query called cms_path. This query points to the path where the operation originates from.
- Changed CMSPlugin.get_parent_classes() from method to classmethod.

3.4.1 release notes

What's new in 3.4.1

Bug Fixes

- Fixed a regression when static placeholder was uneditable if it was present on the page multiple times
- Removed globally unique constraint for Apphook configs.
- Fixed a bug when keyboard short-cuts were triggered when form fields were focused
- Fixed a bug when `shift + space` shortcut wouldn't correctly highlight a plugin in the structure board
- Fixed a bug when plugins that have top-level svg element would break structure board
- Fixed a bug where output from the `show_admin_menu_for_pages` template tag was escaped in Django 1.9
- Fixed a bug where plugins would be rendered as editable if toolbar was shown but user was not in edit mode.
- Fixed CSS reset issue with short-cuts modal

3.4 release notes

The most significant change in this release is the removal of revision support (i.e. undo/redo/recover functionality on pages) from the core django CMS. This functionality will be reinstated as an optional addon in due course, but in the meantime, that functionality is not available.

What's new in 3.4

- Changed the way CMS plugins are rendered. The HTML `div` with `cms-plugin` class is no longer rendered around every CMS plugin. Instead a combination of `template` tags and JavaScript is used to add event handlers and plugin data directly to the plugin markup. This fixes most of the rendering issues caused by the extra markup.
- Changed asset cache-busting implementation, which is now handled by a path change, rather than the `GET` parameter.
- Added the option to copy pages in the page tree using the drag and drop interface.
- Made it possible to use multi-table inheritance for Page/Title extensions.
- Refactored plugin rendering functionality to speed up loading time in both structure and content modes.
- Added a new `Shift + Space` shortcut to switch between structure and content mode while highlighting the current plugin, revealing its position.
- Improved keyboard navigation
- Added help modal about available short-cuts
- Added fuzzy matching to the plugin picker.

- Changed the `downcast_plugins` utility to return a generator instead of a list.
- Fixed a bug that caused an aliased placeholder to show in structure mode.
- Fixed a bug that prevented aliased content from showing correctly without publishing the page first.
- Added help text to an `Alias` plugin change form when attached to a page to show the content editor where the content is aliased from.
- Removed revision support from django CMS core. As a result both `CMS_MAX_PAGE_HISTORY_REVERSIONS` and `CMS_MAX_PAGE_PUBLISH_REVERSIONS` settings are no longer supported, as well as the `with_revision` parameter in `cms.api.create_page` and `cms.api.create_title`.
- In `cms.plugin_base.CMSPluginBase` methods `get_child_classes` and `get_parent_classes` now are implemented as a `@classmethod`.

Upgrading to 3.4

A database migration is required because the default value of CMSPlugin.position was set to 0 instead of null.

Please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Then run:

```
python manage.py migrate
python manage.py cms fix-tree
```

Backward incompatible changes

Apphooks & Toolbars

As per our deprecation policy we've now removed the backwards compatible shim for `cms_app.py` and `cms_toolbar.py`. If you have not done so already, please rename these to `cms_apps.py` and `cms_toolbars.py`.

Permissions

The permissions system was heavily refactored. As a result, several internal functions and methods have been removed or changed.

Functions removed:

- `user_has_page_add_perm`
- `has_page_add_permission`
- `has_page_add_permission_from_request`
- `has_any_page_change_permissions`
- `has_auth_page_permission`
- `has_page_change_permission`
- `has_global_page_permission`
- `has_global_change_permissions_permission`
- `has_generic_permission`

- `load_view_restrictions`
- `get_any_page_view_permissions`

The following methods were changed to require a user parameter instead of a request:

- `Page.has_view_permission`
- `Page.has_add_permission`
- `Page.has_change_permission`
- `Page.has_delete_permission`
- `Page.has_delete_translation_permission`
- `Page.has_publish_permission`
- `Page.has_advanced_settings_permission`
- `Page.has_change_permissions_permission`
- `Page.has_move_page_permission`

These are also deprecated in favour of their counterparts in `cms.utils.page_permissions`.

To keep consistency with both django CMS permissions and Django permissions, we've modified the vanilla permissions system (`CMS_PERMISSIONS = False`) to require users to have certain Django permissions to perform an action.

Here's an overview:

Action	Permission required
Add Page	Can Add Page & Can Change Page
Change Page	Can Change Page
Delete Page	Can Change Page & Can Delete Page
Move Page	Can Change Page
Publish Page	Can Change Page & Can Publish Page

This change will only affect non-superuser staff members.

Warning: If you have a custom `Page` extension with a configured toolbar, please see the updated *example*. It uses the new permission internals.

Manual plugin rendering

We've rewritten the way plugins and placeholders are rendered. As a result, if you're manually rendering plugins and placeholders you'll have to adapt your code to match the new rendering mechanism.

To render a plugin programmatically, you will need a context and request object.

Warning: Manual plugin rendering is not a public API, and as such it's subject to change without notice.

```
from django.template import RequestContext
from cms.plugin_rendering import ContentRenderer

def render_plugin(request, plugin):
    renderer = ContentRenderer(request)
    context = RequestContext(request)
```

```
    # Avoid errors if plugin require a request object
    # when rendering.
    context['request'] = request
    return renderer.render_plugin(plugin, context)
```

Like a plugin, to render a placeholder programmatically, you will need a context and request object.

Warning: Manual placeholder rendering is not a public API, and as such it's subject to change without notice.

```
from django.template import RequestContext
from cms.plugin_rendering import ContentRenderer

def render_placeholder(request, placeholder):
    renderer = ContentRenderer(request)
    context = RequestContext(request)
    # Avoid errors if plugin require a request object
    # when rendering.
    context['request'] = request
    content = renderer.render_placeholder(
       placeholder,
       context=context,
    )
    return content
```

3.3 release notes

django CMS 3.3 has been planned largely as a consolidation release, to build on the progress made in 3.2 and pave the way for the future ones.

The largest major change is dropped support for Django 1.6 and 1.7, and Python 2.6 followed by major code cleanup to remove compatibility shims.

What's new in 3.3

- Removed support for Django 1.6, 1.7 and python 2.6
- Changed the default value of CMSPlugin.position to 0 instead of null
- Refactored the language menu to allow for better integration with many languages
- Refactored management commands completely for better consistency
- Fixed "failed to load resource" for favicon on welcome screen
- Changed behaviour of toolbar CSS classes: `cms-toolbar-expanded` class is only added now when toolbar is fully expanded and not at the beginning of the animation. `cms-toolbar-expanding` and `cms-toolbar-collapsing` classes are added at the beginning of their respective animations.
- Added unit tests for CMS JavaScript files
- Added frontend integration tests (written with Casper JS)
- Removed frontend integration tests (written with Selenium)

- Added the ability to declare cache expiration periods on a per-plugin basis
- Improved UI of page tree
- Improved UI in various minor ways
- Added a new setting CMS_INTERNAL_IPS for defining a set of IP addresses for which the toolbar will appear for authorized users. If left unset, retains the existing behaviour of allowing toolbar for authorized users at any IP address.
- Changed behaviour of sideframe; is no longer resizable, opens to 90% of the screen or 100% on small screens.
- Removed some unnecessary reloads after closing sideframe.
- Added the ability to make pagetree actions work on currently picked language
- Removed deprecated CMS_TOOLBAR_SIMPLE_STRUCTURE_MODE setting
- Introduced the method `get_cache_expiration` on CMSPluginBase to be used by plugins for declaring their rendered content's period of validity.
- Introduced the method `get_vary_cache_on` on CMSPluginBase to be used by plugins for declaring `VARY` headers.
- Improved performance of plugin moving; no longer saves all plugins inside the placeholder.
- Fixed breadcrumbs of recently moved plugin reflecting previous position in the tree
- Refactored plugin adding logic to no longer create the plugin before the user submits the form.
- Improved the behaviour of the placeholder cache
- Improved fix-tree command to sort by position and path when rebuilding positions.
- Fixed several regressions and tree corruptions on page move.
- Added new class method on CMSPlugin `requires_parent_plugin`
- Fixed behaviour of `get_child_classes`; now correctly calculates child classes when not configured in the placeholder.
- Removed internal `ExtraMenuItems` tag.
- Removed internal `PluginChildClasses` tag.
- Modified RenderPlugin tag; no longer renders the `content.html` template and instead just returns the results.
- Added a `get_cached_template` method to the `Toolbar()` main class to reuse loaded templates per request. It works like Django's cached template loader, but on a request basis.
- Added a new method `get_urls()` on the appbase class to get CMSApp.urls, to allow passing a page object to it.
- Changed JavaScript linting from JSHint and JSCS to ESLint
- Fixed a bug when it was possible to drag plugin into clipboard
- Fixed a bug where clearing clipboard was closing any open modal
- Added CMS_WIZARD_CONTENT_PLACEHOLDER setting
- Renamed the CMS_WIZARD_* settings to CMS_PAGE_WIZARD_*
- Deprecated the old-style wizard-related settings
- Improved documentation further
- Improved handling of uninstalled apphooks

- Fixed toolbar placement when foundation is installed
- Fixed an issue which could lead to an apphook without a slug
- Fixed numerous frontend issues
- Added contribution policies documentation
- Corrected an issue where someone could see and use the internal placeholder plugin in the structure board
- Fixed a regression where the first page created was not automatically published
- Corrected the instructions for using the `delete-orphaned-plugins` command
- Re-pinned django-treebeard to >=4.0.1

Upgrading to 3.3

A database migration is required because the default value of CMSPlugin.position was set to 0 instead of null.

Please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Then run:

```
python manage.py migrate
python manage.py cms fix-tree
```

Deprecation of Old-Style Page Wizard Settings

In this release, we introduce a new naming scheme for the Page Wizard settings that better reflects that they effect the CMS's Page Wizards, rather than all wizards. This will also allow future settings for different wizards with a smaller chance of confusion or naming-collision.

This release simultaneously deprecates the old naming scheme for these settings. Support for the old naming scheme will be dropped in version 3.5.0.

Action Required

Developers using any of the following settings in their projects should rename them as follows at their earliest convenience.

```
CMS_WIZARD_DEFAULT_TEMPLATE => CMS_PAGE_WIZARD_DEFAULT_TEMPLATE
CMS_WIZARD_CONTENT_PLUGIN => CMS_PAGE_WIZARD_CONTENT_PLUGIN
CMS_WIZARD_CONTENT_PLUGIN_BODY => CMS_PAGE_WIZARD_CONTENT_PLUGIN_BODY
CMS_WIZARD_CONTENT_PLACEHOLDER => CMS_PAGE_WIZARD_CONTENT_PLACEHOLDER
```

The CMS will accept both-schemes until 3.5.0 when support for the old scheme will be dropped. During this transition period, the CMS prefers the new-style naming if both schemes are used in a project's settings.

Backward incompatible changes

Management commands

Management commands uses now argparse instead of optparse, following the Django deprecation of the latter API.

The commands behaviour has remained untouched.

Detailed changes:

- commands now use argparse subcommand API which leads to slightly different help output and other internal differences. If you use the commands by using Django's `call_command` function you will have to adapt the command invocation to reflect this.
- some commands have been rename replacing underscores with hyphens for consistency
- all arguments are now non-positional. If you use the commands by using Django's `call_command` function you will have to adapt the command invocation to reflect this.

Signature changes

The signatures of the toolbar methods `get_or_create_menu` have a new kwarg `disabled` *inserted* (not appended). This was done to maintain consistency with other, existing toolbar methods. The signatures are now:

- `cms.toolbar.items.Menu.get_or_create_menu(key, verbose_name, disabled=False, side=LEFT, position=None)`
- `cms.toolbar.toolbar.CMSToolbar.get_or_create_menu(key, verbose_name=None, disabled=False, side=LEFT, position=None)`

It should only affect developers who use kwargs as positional args.

3.2.5 release notes

What's new in 3.2.5

Note: This release is identical to 3.2.4, but had to be released also as 3.2.4 due to a Python wheel packaging issue.

Bug Fixes

- Fix cache settings
- Fix user lookup for view restrictions/page permissions when using raw id field
- Fixed regression when page couldn't be copied if CMS_PERMISSION was False
- Fixes an issue relating to uninstalling a namespaced application
- Adds "Can change page" permission
- Fixes a number of page-tree issues the could lead data corruption under certain conditions
- Addresses security vulnerabilities in the *render_model* template tag that could lead to escalation of privileges or other security issues.
- Addresses a security vulnerability in the cms' usage of the messages framework

- Fixes security vulnerabilities in custom FormFields that could lead to escalation of privileges or other security issues.

Important: This version of django CMS introduces a new setting: `CMS_UNESCAPED_RENDER_MODEL_TAGS` with a default value of *True*. This default value allows upgrades to occur without forcing django CMS users to do anything, but, please be aware that this setting continues to allow known security vulnerabilities to be present. Due to this, the new setting is immediately deprecated and will be removed in a near-future release.

To immediately improve the security of your project and to prepare for future releases of django CMS and related addons, the project administrator should carefully review each use of the `render_model` template tags provided by django CMS. He or she is encouraged to ensure that all content which is rendered to a page using this template tag is cleansed of any potentially harmful HTML markup, CSS styles or JavaScript. Once the administrator or developer is satisfied that the content is clean, he or she can add the "safe" filter parameter to the render_model template tag if the content should be rendered without escaping. If there is no need to render the content un-escaped, no further action is required.

Once all template tags have been reviewed and adjusted where necessary, the administrator should set `CMS_UNESCAPED_RENDER_MODEL_TAGS = False` in the project settings. At that point, the project is more secure and will be ready for any future upgrades.

DjangoCMS Text CKEditor

Action required

CMS 3.2.1 is not compatible with djangocms-text-ckeditor < 2.8.1. If you're using djangocms-text-ckeditor, please upgrade to 2.8.1 or later.

3.2.4 release notes

What's new in 3.2.4

Bug Fixes

- Fix cache settings
- Fix user lookup for view restrictions/page permissions when using raw id field
- Fixed regression when page couldn't be copied if CMS_PERMISSION was False
- Fixes an issue relating to uninstalling a namespaced application
- Adds "Can change page" permission
- Fixes a number of page-tree issues the could lead data corruption under certain conditions
- Addresses security vulnerabilities in the *render_model* template tag that could lead to escalation of privileges or other security issues.
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Once all template tags have been reviewed and adjusted where necessary, the administrator should set `CMS_UNESCAPED_RENDER_MODEL_TAGS = False` in the project settings. At that point, the project is more secure and will be ready for any future upgrades.

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3.2.3 release notes

What's new in 3.2.3

Bug Fixes

- Fix the display of hyphenated language codes in the page tree
- Fix a family of issues relating to unescaped translations in the page tree

3.2.2 release notes

What's new in 3.2.2

Improvements

- Substantial "under-the-hood" improvements to the page tree resulting in significant reduction of page-tree reloads and generally cleaner code
- Update jsTree version to 3.2.1 with slight adaptations to the page tree
- Improve the display and usability of the language menu, especially in cases where there are many languages
- Documentation improvements

Bug Fixes

- Fix an issue relating to search fields in plugins
- Fix an issue where the app-resolver would trigger locales into migrations
- Fix cache settings
- Fix ToolbarMiddleware.is_cms_request logic
- Fix numerous Django 1.9 deprecations
- Numerous other improvements to overall stability and code quality

Model Relationship Back-References and Django 1.9

Django 1.9 is lot stricter about collisions in the `related_names` of relationship fields than previous versions of Django. This has brought to light issues in django CMS relating to the private field `CMSPlugin.cmsplugin_ptr`. The issue becomes apparent when multiple packages are installed that provide plugins with the same model class name. A good example would be if you have the package `djangocms-file` installed, which has a poorly named CMSPlugin model subclass called `File`, then any other package that has a plugin with a field named "file" would most likely cause an issue. Considering that `djangocms-file` is a very common plugin to use and a field name of "file" is not uncommon in other plugins, this is less than ideal.

Fortunately, developers can correct these issues in their own projects while they await improvements in django CMS. There is an internal field that is created when instantiating plugins: `CMSPlugin.cmsplugin_ptr`. This private field is declared in the CMSPlugin base class and is populated on instantiation using the lower-cased model name of the CMSPlugin subclass that is being registered.

A subclass to `CMSPlugin` can declare their own `cmsplugin_ptr` field to immediately fix this issue. The easiest solution is to declare this field with a `related_name` of "+". In typical Django fashion, this will suppress the back-reference and prevent any collisions. However, if the back-reference is required for some reason (very rare), then we recommend using the pattern `%(app_label)s_%(class_name)s`. In fact, in version 3.3 of django CMS, this is precisely the string-template that the reference setup will use to create the name. Here's an example:

```
class MyPlugin(CMSPlugin):
    class Meta:
        app_label = 'my_package'

    cmsplugin_ptr = models.OneToOneField(
        CMSPlugin,
        related_name='my_package_my_plugin',
        parent_link=True
    )

    # other fields, etc.
    # ...
```

Please note that CMSPlugin.cmsplugin_ptr will remain a private field.

Notice of Upcoming Change in 3.3

As outlined in the section immediately above, the pattern currently used to derive a `related_name` for the private field `CMSPlugin.cmsplugin_ptr` may result in frequent collisions. In django CMS 3.3, this string-template will be changed to utilise both the `app_label` and the model class name. In the majority of cases, this will not affect developers or users, but if your project uses these back-references for some reason, please be aware of this change and plan accordingly.

Treebeard corruption

Prior to 3.2.1 moving or pasting nested plugins could lead to some non-fatal tree corruptions, raising an error when adding plugins under the newly pasted plugins.

To fix these problems, upgrade to 3.2.1 or later and then run `manage.py cms fix-tree` command to repair the tree.

DjangoCMS Text CKEditor

Action required

CMS 3.2.2 is not compatible with djangocms-text-ckeditor < 2.8.1. If you're using djangocms-text-ckeditor, please upgrade to 2.8.1 or up.

3.2.1 release notes

What's new in 3.2.1

Improvements

- Add support for Django 1.9 (with some deprecation warnings).
- Add support for django-reversion 1.10+ (required by Django 1.9+).
- Add placeholder name to the edit tooltip.
- Add `attr['is_page']=True` to CMS Page navigation nodes.
- Add Django and Python versions to debug bar info tooltip

Bug Fixes

- Fix an issue with refreshing the UI when switching CMS language.
- Fix an issue with sideframe urls not being remembered after reload.
- Fix breadcrumb in page revision list.
- Fix clash with Foundation that caused "Add plugin" button to be unusable.
- Fix a tree corruption when pasting a nested plugin under another plugin.
- Fix message with CMS version not showing up on hover in debug mode.
- Fix messages not being positioned correctly in debug mode.
- Fix an issue where plugin parent restrictions where not respected when pasting a plugin.

- Fix an issue where "Copy all" menu item could have been clicked on empty placeholder.
- Fix a bug where page tree styles didn't load from STATIC_URL that pointed to a different host.
- Fix an issue where the side-frame wouldn't refresh under some circumstances.
- Honour CMS_RAW_ID_USERS in GlobalPagePermissionAdmin.

Treebeard corruption

Prior to 3.2.1 moving or pasting nested plugins would lead to some non-fatal tree corruptions, raising an error when adding plugins under the newly pasted plugins.

To fix these problems, upgrade to 3.2.1 and then run `manage.py cms fix-tree` command to repair the tree.

DjangoCMS Text CKEditor

Action required

CMS 3.2.1 is not compatible with djangocms-text-ckeditor < 2.8.1. If you're using djangocms-text-ckeditor, please upgrade to 2.8.1 or up.

3.2 release notes

django CMS 3.2 introduces touch-screen support, significant improvements to the structure-board, and numerous other updates and fixes for the frontend. Behind the scenes, auto-reloading following apphook configuration changes will make life simpler for all users.

> **Warning:** Upgrading from previous versions
>
> 3.2 introduces some changes that **require** action if you are upgrading from a previous version. Please read *Upgrading django CMS 3.1 to 3.2* for a step-by-step guide to the process of upgrading from 3.1 to 3.2.

What's new in 3.2

- New welcome page to help new users
- touch-screen support for most editing interfaces, for sizes from small tablets to table-top devices
- enhanced and polished user interface
- much-needed improvements to the structure-board
- enhancements to components such as the pop-up plugin editor, sideframe (now called the *overlay*) and the toolbar
- significant speed improvements on loading, HTTP requests and file sizes
- restarts are no longer required when changing apphook configurations
- a new content wizard system, adaptable to arbitrary content types

Changes that require attention

Touch interface support

For general information about touch interface support, see the *touch screen device notes* in the documentation.

Important: These notes about touch interface support apply only to the **django CMS admin and editing interfaces**. The visitor-facing published site is **wholly independent** of this, and the responsibility of the site developer. A good site should already work well for its visitors, whatever interface they use!

Numerous aspects of the CMS and its interface have been updated to work well with touch-screen devices. There are some restrictions and warnings that need to be borne in mind.

Device support

Smaller devices such as most phones are too small to be adequately usable. For example, your Apple Watch is sadly unlikely to provide a very good django CMS editing experience.

Older devices will often lack the performance to support a usefully responsive frontend editing/administration interface.

There are some device-specific issues still to be resolved. Some of these relate to the CKEditor (the default django CMS text editor). We will continue to work on these and they will be addressed in a future release.

See *Device support* for information about devices that have been tested and confirmed to work well, and about known issues affecting touch-screen device support.

Feedback required

We've tested the CMS interface extensively, but will be very keen to have feedback from other users - device reports, bug reports and general suggestions and opinions are very welcome.

Bug-fixes

- An issue in which `{% placeholder %}` template tags ignored the `lang` parameter has been fixed.

  However this may affect the behaviour of your templates, as now a previously-ignored parameter will be recognised. If you used the `lang` parameter in these template tags you may be affected: check the behaviour of your templates after upgrading.

Content wizards

Content creation wizards can help simplify production of content, and can be created to handle non-CMS content too.

For a quick introduction to using a wizard as a content editor, see the user tutorial.

Renaming cms_app, cms_toolbar, menu modules

`cms_app.py`, `cms_toolbar.py` and `menu.py` have been renamed to `cms_apps.py`, `cms_toolbars.py` and `cms_menus.py` for consistency.

Old names are still supported but deprecated; support will be removed in 3.4.

Action required

In your own applications that use these modules, rename `cms_app.py` to `cms_apps.py`, `cms_toolbar.py` to `cms_toolbars.py` and `menu.py` to `cms_menus.py`.

New `ApphookReloadMiddleware`

Until now, changes to apphooks have required a restart of the server in order to take effect. A new optional middleware class, *cms.middleware.utils.ApphookReloadMiddleware*, makes this automatic.

For developers

Various improvements have been implemented to make developing with and for django CMS easier. These include:

- improvements to frontend code, to comply better with aldryn-boilerplate-bootstrap3
- changes to directory structure for frontend related components such as JavaScript and SASS.
- We no longer use `develop.py`; we now use `manage.py` for all development tasks. See contributing_patch for examples.
- We've moved our `widgets.py` JavaScript to `static/cms/js/widgets`.

Code formatting

We've switched from tabs (in some places) to four spaces *everywhere*. See *Contributing code* for more on formatting.

gulp.js

We now use *gulp.js* for linting, compressing and bundling of frontend files.

Sass-related changes

We now use LibSass rather than Compass for building static files (this only affects frontend developers *of* django CMS - contributors to it, not other users or developers). We've also adopted CSSComb.

`.editorconfig` file

We've added a `.editorconfig` (at the root of the project) to provide cues to text editors.

Automated spelling checks for documentation

Documentation is now checked for spelling. A `make spelling` command is available now when working on documentation, and our Travis Continuous Integration server also runs these checks.

See the *Spelling* section in the documentation.

New structure board

The structure board is cleaner and easier to understand. It now displays its elements in a tree, rather than in a series of nested boxes.

You can optionally enable the old appearance and behaviour with the `CMS_TOOLBAR_SIMPLE_STRUCTURE_MODE` setting (this option will be removed in 3.3).

Replaced the sideframe with an overlay

The sideframe that could be expanded and collapsed to reveal a view of the admin and other controls has been replaced by a simpler and more elegant *overlay* mechanism.

The API documentation still refers to the `sideframe`, because it is invoked in the same way, and what has changed is merely the behaviour in the user's browser.

In other words, *sideframe* and the *overlay* refer to different versions of the same thing.

New startup page

A new startup mode makes it easier for users (especially new users) to dive straight into editing when launching a new site.

Known issues

The sub-pages of a page with an apphook will be unreachable (`404 page not found`), due to internal URL resolution mechanisms in the CMS. Though it's unlikely that most users will need sub-pages of this kind (typically, an apphooked page will create its own sub-pages) this issue will be addressed in a forthcoming release.

Backward-incompatible changes

See the *Frontend code* documentation.

There are no other known backward-incompatible changes.

Upgrading django CMS 3.1 to 3.2

Please note any changes that require action above, and take action accordingly.

A database migration is required (a new model, `UrlconfRevision` has been added as part of the apphook reload mechanism):

Note also that any third-party applications you update may have their own migrations, so as always, before upgrading, please make sure that your current database is consistent and in a healthy state, and **make a copy of the database before proceeding further.**

Then run:

```
python manage.py migrate
```

to migrate.

Otherwise django CMS 3.2 represents a fairly easy upgrade path.

Pending deprecations

In django CMS 3.3:

> Django 1.6, 1.7 and Python 2.6 will no longer be supported. If you still using these versions, you are strongly encouraged to begin exploring the upgrade process to a newer version.
>
> The `CMS_TOOLBAR_SIMPLE_STRUCTURE_MODE` setting will be removed.

3.1.5 release notes

What's new in 3.1.5

Bug Fixes

- Fixed a tree corruption when pasting a nested plugin under another plugin.
- Improve CMSPluginBase.render documentation
- Fix CMSEditableObject context generation which generates to errors with django-classy-tags 0.7.1
- Fix error in toolbar when LocaleMiddleware is not used
- Move templates validation in app.ready
- Fix ExtensionToolbar when language is removed but titles still exists
- Fix pages menu missing on fresh install 3.1
- Fix incorrect language on placeholder text for redirect field
- Fix PageSelectWidget JS syntax
- Fix redirect when disabling toolbar
- Fix CMS_TOOLBAR_HIDE causes 'WSGIRequest' object has no attribute 'toolbar'

Treebeard corruption

Prior to 3.1.5 moving or pasting nested plugins would lead to some non-fatal tree corruptions, raising an error when adding plugins under the newly pasted plugins.

To fix these problems, upgrade to 3.1.5 and then run `manage.py cms fix-tree` command to repair the tree.

DjangoCMS Text CKEditor

Action required

CMS 3.1.5 is not compatible with djangocms-text-ckeditor < 2.7.1. If you're using djangocms-text-ckeditor, please upgrade to 2.7.1 or up. Keep in mind that djangocms-text-ckeditor >= 2.8 is compatible only with

3.1.4 release notes

What's new in 3.1.4

Bug Fixes

- Fixed a problem in `0010_migrate_use_structure.py` that broke some migration paths to Django 1.8
- Fixed `fix_tree` command
- Removed some warnings for Django 1.9
- Fixed issue causing plugins to move when using scroll bar of plugin menu in Firefox & IE
- Fixed JavaScript error when using `PageSelectWidget`
- Fixed whitespace markup issues in draft mode
- Added plugin migrations layout detection in tests
- Fixed some treebeard corruption issues

Treebeard corruption

Prior to 3.1.4 deleting pages could lead to some non-fatal tree corruptions, raising an error when publishing, deleting, or moving pages.

To fix these problems, upgrade to 3.1.4 and then run `manage.py cms fix-tree` command to repair the tree.

3.1.3 release notes

What's new in 3.1.3

Bug Fixes

- Add missing migration
- Exclude PageUser manager from migrations
- Fix check for template instance in Django 1.8.x

- Fix error in PageField for Django 1.8
- Fix some Page tree bugs
- Declare Django 1.6.9 dependency in `setup.py`
- Make sure cache version returned is an int
- Fix issue preventing migrations to run on a new database (django 1.8)
- Fix get User model in 0010 migration
- Fix support for unpublished language pages
- Add documentation for plugins data migration
- Fix getting request in _show_placeholder_for_page on Django 1.8
- Fix template inheritance order
- Fix xframe options inheritance order
- Fix placeholder inheritance order
- Fix language chooser template
- Relax html5lib versions
- Fix redirect when deleting a page
- Correct South migration error
- Correct validation on numeric fields in modal pop-up dialogs
- Exclude `scssc` from manifest
- Remove unpublished pages from menu
- Remove page from menu items for performance reason
- Fix access to pages with expired ancestors
- Don't try to modify an immutable QueryDict
- Only attempt to delete cache keys if there are some to be deleted
- Update documentation section
- Fix language chooser template
- Cast to int cache version
- Fix extensions copy when using duplicate page/create page type

Thanks

Many thanks community members who have submitted issue reports and especially to these GitHub users who have also submitted pull requests: basilelegal, gigaroby, ikudryavtsev, jokerejoker, josjevv, tomwardill.

3.1.2 release notes

What's new in 3.1.2

Bug Fixes

- Fix placeholder cache invalidation under some circumstances
- Update translations

3.1.1 release notes

What's new in 3.1.1

- Add Django 1.8 support
- Tutorial updates and improvements
- Add copy_site command
- Add setting to disable toolbar for anonymous users
- Add setting to hide toolbar when a URL is not handled by django CMS
- Add editor configuration

Bug Fixes

- Fixed an issue where privileged users could be tricked into performing actions without their knowledge via a CSRF vulnerability.
- Fix issue with causes menu classes to be duplicated in advanced settings
- Fix issue with breadcrumbs not showing
- Fix issues with show_menu template tags
- Fix an error in placeholder cache
- Fix get_language_from_request if POST and GET exists
- Minor documentation fixes
- Revert whitespace clean-up on flash player to fix it
- Correctly restore previous status of drag bars
- Fix an issue related to "Empty all" Placeholder feature
- Fix plugin sorting in Python 3
- Fix language-related issues when retrieving page URL
- Fix search results number and items alignment in page changelist
- Preserve information regarding the current view when applying the CMS decorator
- Fix errors with toolbar population
- Fix error with watch_models type
- Fix error with plugin breadcrumbs order

- Change the label "Save and close" to "Save as draft"
- Fix X-Frame-Options on top-level pages
- Fix order of which application URLs are injected into `urlpatterns`
- Fix delete non existing page language
- Fix language fallback for nested plugins
- Fix render_model template tag doesn't show correct change list
- Fix Scanning for placeholders fails on include tags with a variable as an argument
- Fix handling of plugin position attribute
- Fix for some structureboard issues
- Pin South version to 1.0.2
- Pin html5lib version to 0.999 until a current bug is fixed
- Make shift tab work correctly in sub-menu
- Fix language chooser template

Potentially backward incompatible changes

The order in which the applications are injected is now based on the page depth, if you use nested apphooks, you might want to check that this does not change the behaviour of your applications depending on applications urlconf greediness.

Thanks

Many thanks community members who have submitted issue reports and especially to these GitHub users who have also submitted pull requests: astagi, dirtycoder, doctormo, douwevandermeij, driesdesmet, furiousdave, ldgarcia, maqnouch, nikolas, northben, olarcheveque, pa0lin082, peterfarrell, sam-m888, sephii, stefanw, timgraham, vstoykov.

A special thank you to vad and nostalgiaz for their support on Django 1.8 support

A special thank to Matt Wilkes and Sylvain Fankhauser for reporting the security issue.

3.1 release notes

django CMS 3.1 has been planned largely as a consolidation release, to build on the progress made in 3.0 and establish a safe, solid base for more ambitious work in the future.

In this release we have tried to maintain maximum backwards-compatibility, particularly for third-party applications, and endeavoured to identify and tidy loose ends in the system wherever possible.

> **Warning:** Upgrading from previous versions
>
> 3.1 introduces some changes that **require** action if you are upgrading from a previous version. Please read *Upgrading django CMS 3.0 to 3.1* for a step-by-step guide to the process of upgrading from 3.0 to 3.1.

What's new in 3.1

Switch from MPTT to MP

Since django CMS 2.0 we have relied on MPTT (Modified Pre-order Tree Traversal) for efficiently handling tree structures in the database.

In 3.1, Django MPTT has been replaced by django-treebeard, to improve performance and reliability.

Over the years MPTT has proved not to be fast enough for big tree operations (>1000 pages); tree corruption, because of transactional errors, has also been a problem.

django-treebeard uses MP (Materialised Path). MP is more efficient and has more error resistance then MPTT. It should make working with and using django CMS better - faster and reliable.

Other than this, end users should not notice any changes.

Note: User feedback required

We require as much feedback as possible about the performance of django-treebeard in this release. Please let us know your experiences with it, especially if you encounter any problems.

Note: Backward incompatible change

While most of the low-level interface is very similar between `django-mptt` and `django-treebeard` they are not exactly the same. If any custom code needs to make use of the low-level interfaces of the page or plugins tree, please see the django-treebeard documentation for information on how to use equivalent calls in `django-treebeard`.

Note: Handling plugin data migrations

Please check plugin-datamigrations-3.1 for information on how to create migrations compatible with django CMS 3.0 and 3.1

Action required

Run manage.py cms fix-mptt before you upgrade.

Developers who use django CMS will need to run the schema and data migrations that are part of this release. Developers of third-party applications that relied on the Django MPTT that shipped with django CMS are advised to update their own applications so that they install it independently.

Dropped support for Django 1.4 and 1.5

Starting from version 3.1, django CMS runs on Django 1.6 (specifically, 1.6.9 and later) and 1.7.

Warning: Django security support

Django 1.6 support is provided as an interim measure only. In accordance with the Django Project's security policies, 1.6 no longer receives security updates from the Django Project team. Projects running on Django 1.6 have known vulnerabilities, so you are advised to upgrade your installation to 1.7 or 1.8 as soon as possible.

Action required

If you're still on an earlier version, you will need to install a newer one, and make sure that your third-party applications are also up-to-date with it before attempting to upgrade django CMS.

South is now an optional dependency

As Django South is now required for Django 1.6 only, it's marked as an optional dependency.

Action required

To install South along with django CMS use `pip install django-cms[south]`.

Changes to PlaceholderAdmin.add_plugin

Historically, when a plugin was added to django CMS, a POST request was made to the `PlaceholderAdmin.add_plugin` endpoint (and going back into very ancient history before `PlaceholderAdmin` existed, it was `PageAdmin.add_plugin`). This would create an instance of `CMSPlugin`, but not an instance of the actual plugin model itself. It would then let the user agent edit the created plugin, which when saved would put the database back in to a consistent state, with a plugin instance connected to the otherwise empty and meaningless `CMSPlugin`.

In some cases, "ghost plugins" would be created, if the process of creating the plugin instance failed or were interrupted, for example by the browser window's being closed.

This would leave orphaned `CMSPlugin` instances in the database without any data. This could result pages not working at all, due to the resulting database inconsistencies.

This issue has now been solved. Calling `CMSPluginBase.add_plugin` with a GET request now serves the form for creating a new instance of a plugin. Then on submitting that form via POST, the plugin is created in its entirety, ensuring a consistent database and an end to ghost plugins.

However, to solve it some backwards incompatible changes to **non-documented APIs** that developers might have used have had to be made.

CMSPluginBase permission hooks

Until now, `CMSPluginBase.has_delete_permission`, `CMSPluginBase.has_change_permission` and `CMSPluginBase.has_add_permission` were handled by a single method, which used an undocumented and unreliable property on `CMSPluginBase` instances (or subclasses thereof) to handle permission management.

In 3.1, `CMSPluginBase.has_add_permission` is its own method that implements proper permission checking for adding plugins.

If you want to work with those APIs, see the Django documentation for more on the permission methods.

CMSPluginBase.get_form

Prior to 3.1, this method would only ever be called with an actual instance available.

As of 3.1, this method will be called without an instance (the `obj` argument to the method will be `None`) if the form is used to add a plugin, rather than editing it. Again, this is in line with how Django's `ModelAdmin` works.

If you need access to the `Placeholder` object to which the plugin will be added, the `request` object is *guaranteed* to have a `placeholder_id` key in `request.GET`, which is the primary key of the `Placeholder` object to which the plugin will be added. Similarly, `plugin_language` in `request.GET` holds the language code of the plugin to be added.

CMSPlugin.add_view

This method used to never be called, but as of 3.1 it will be. Should you need to hook into this method, you may want to use the `CMSPluginBase.add_view_check_request` method to verify that a request made to this view is valid. This method will perform integrity and permission checks for the GET parameters of the request.

Migrations moved

Migrations directories have been renamed to conform to the new standard layout:

- Django 1.7 migrations: in the default `cms/migrations` and `menus/migrations` directories
- South migrations: in the `cms/south_migrations` and `menus/south_migrations` directories

Action required

South 1.0.2 or newer is required to handle the new layout correctly, so make sure you have that installed.

If you are upgrading from django CMS 3.0.x running on Django 1.7 you need to remove the old migration path from MIGRATION_MODULES settings.

Plugins migrations moving process

Core plugins are being changed to follow the new convention for the migration modules, starting with **djangocms_text_ckeditor** 2.5 released together with django CMS 3.1.

Action required

Check the readme file of each plugin when upgrading to know the actions required.

Structure mode permission

A new Can use Structure mode* permission has been added.

Without this permission, a non-superuser will no longer have access to structure mode. This makes possible a more strict workflow, in which certain users are able to edit content but not structure.

This change includes a data migration that adds the new permission to any staff user or group with `cms.change_page` permission.

Action required

You may need to adjust these permissions once you have completed migrating your database.

Note that if you have existing users in your database, but are installing django CMS and running its migrations for the first time, you will need to grant them these permissions - they will not acquire them automatically.

Simplified loading of view restrictions in the menu

The system that loads page view restrictions into the menu has been improved, simplifying the queries that are generated, in order to make it faster.

Note: User feedback required

We require as much feedback as possible about the performance of this feature in this release. Please let us know your experiences with it, especially if you encounter any problems.

Toolbar API extension

The toolbar API has been extended to permit more powerful use of it in future development, including the use of "clipboard-like" items.

Per-namespace apphook configuration

django CMS provides a new API to define namespaced Apphook configurations.

Aldryn Apphooks Config has been created and released as a standard implementation to take advantage of this, but other implementations can be developed.

Improvements to the toolbar user interface

Some minor changes have been implemented to improve the toolbar user interface. The old **Draft/Live** switch has been replaced to achieve a more clear distinction between page states, and **Edit** and **Save as draft** buttons are now available in the toolbar to control the page editing workflow.

Placeholder language fallback default to True

`language_fallback` in *CMS_PLACEHOLDER_CONF* is `True` by default.

New template tags

`render_model_add_block`

The family of *render_model* template tags that allow Django developers to make any Django model editable in the frontend has been extended with *`render_model_add_block`*, which can offer arbitrary markup as the *Edit* icon (rather than just an image as previously).

`render_plugin_block`

Some user interfaces have some plugins hidden from display in edit/preview mode. *`render_plugin_block`* provides a way to expose them for editing, and also more generally provides an alternative means of triggering a plugin's change form.

Plugin table naming

Old-style plugin table names (for example, `cmsplugin_<plugin name>` are no longer supported. Relevant code has been removed.

Action required

Any plugin table name must be migrated to the standard (`<application name>_<table name>` layout.

`cms.context_processors.media` replaced by `cms.context_processors.cms_settings`

Action required

Replace the `cms.context_processors.media` with `cms.context_processors.cms_settings` in `settings.py`.

Upgrading django CMS 3.0 to 3.1

Preliminary steps

Before upgrading, please make sure that your current database is consistent and in a healthy state.

To ensure this, run two commands:

- `python manage.py cms delete_orphaned_plugins`
- `python manage.py cms fix-mptt`

Make a copy of the database before proceeding further.

Settings update

- Change `cms.context_processors.media` to `cms.context_processors.cms_settings` in `TEMPLATE_CONTEXT_PROCESSORS`.
- Add `treebeard` to `INSTALLED_APPS`, and remove `mptt` if not required by other applications.
- If using Django 1.7 remove `cms` and `menus` from `MIGRATION_MODULES` to support the new migration layout.
- If migrating from Django 1.6 and below to Django 1.7, remove `south` from `installed_apps`.
- Eventually set `language_fallback` to `False` in *CMS_PLACEHOLDER_CONF* if you do not want language fallback behaviour for placeholders.

Update the database

- Rename plugin table names, to conform to the new naming scheme (see above). **Be warned** that not all third-party plugin applications may provide these migrations - in this case you will need to rename the table manually. Following the upgrade, django CMS will look for the tables for these plugins under their new name, and will report that they don't exist if it can't find them.
- The migration for MPTT to `django-treebeard` is handled by the django CMS migrations, thus apply migrations to update your database:

```
python manage.py migrate
```

3.0.16 release notes

Bug-fixes

- Fixed JavaScript error when using `PageSelectWidget`
- Fixed whitespace markup issues in draft mode
- Added plugin migrations layout detection in tests

3.0.15 release notes

What's new in 3.0.15

Bug Fixes

- Relax html5lib versions
- Fix redirect when deleting a page
- Correct South migration error
- Correct validation on numeric fields in modal pop-up dialogs
- Exclude `scssc` from manifest
- Remove unpublished pages from menu
- Remove page from menu items for performance reason
- Fix access to pages with expired ancestors

- Don't try to modify an immutable QueryDict
- Only attempt to delete cache keys if there are some to be deleted
- Update documentation section
- Fix language chooser template
- Cast to int cache version
- Fix extensions copy when using duplicate page/create page type

Thanks

Many thanks community members who have submitted issue reports and especially to these GitHub users who have also submitted pull requests: basilelegal.

3.0.14 release notes

What's new in 3.0.14

Bug Fixes

- Fixed an issue where privileged users could be tricked into performing actions without their knowledge via a CSRF vulnerability.
- Fix issue with causes menu classes to be duplicated in advanced settings
- Fix issue with breadcrumbs not showing
- Fix issues with show_menu template tags
- Minor documentation fixes
- Fix an issue related to "Empty all" Placeholder feature
- Fix plugin sorting in Python 3
- Fix search results number and items alignment in page changelist
- Preserve information regarding the current view when applying the CMS decorator
- Fix X-Frame-Options on top-level pages
- Fix order of which application URLs are injected into `urlpatterns`
- Fix delete non existing page language
- Fix language fallback for nested plugins
- Fix render_model template tag doesn't show correct change list
- Fix Scanning for placeholders fails on include tags with a variable as an argument
- Pin South version to 1.0.2
- Pin html5lib version to 0.999 until a current bug is fixed
- Fix language chooser template

Potentially backward incompatible changes

The order in which the applications are injected is now based on the page depth, if you use nested apphooks, you might want to check that this does not change the behaviour of your applications depending on applications urlconf greediness.

Thanks

Many thanks community members who have submitted issue reports and especially to these GitHub users who have also submitted pull requests: douwevandermeij, furiousdave, nikolas, olarcheveque, sephii, vstoykov.

A special thank to Matt Wilkes and Sylvain Fankhauser for reporting the security issue.

3.0.13 release notes

What's new in 3.0.13

Bug Fixes

- Numerous documentation including installation and tutorial updates
- Numerous improvements to translations
- Improves reliability of apphooks
- Improves reliability of Advanced Settings on page when using apphooks
- Allow page deletion after template removal
- Improves upstream caching accuracy
- Improves CMSAttachMenu registration
- Improves handling of mis-typed URLs
- Improves redirection as a result of changes to page slugs, etc.
- Improves performance of "watched models"
- Improves frontend performance relating to re-sizing the sideframe
- Corrects an issue where items might not be visible in structure mode menus
- Limits version of django-mptt used in CMS for 3.0.x
- Prevent accidental upgrades to Django 1.8, which is not yet supported

Many thanks community members who have submitted issue reports and especially to these GitHub users who have also submitted pull requests: elpaso, jedie, jrief, jsma, treavis.

3.0.12 release notes

What's new in 3.0.12

Bug Fixes

- Fixes a regression caused by extra whitespace in JavaScript

3.0.11 release notes

What's new in 3.0.11

- Core support for multiple instances of the same apphooked application
- The template tag `render_model_add` can now accept a model class as well as a model instance

Bug Fixes

- Fixes an issue with reverting to Live mode when moving plugins
- Fixes a missing migration issue
- Fixes an issue when using the PageField widget
- Fixes an issue where duplicate page slugs is not prevented in some cases
- Fixes an issue where copying a page didn't copy its extensions
- Fixes an issue where translations where broken when operating on a page
- Fixes an edge-case SQLite issue under Django 1.7
- Fixes an issue where a confirmation dialog shows only some of the plugins to be deleted when using the "Empty All" context-menu item
- Fixes an issue where deprecated `mimetype` was used instead of `contenttype`
- Fixes an issue where `cms check` erroneous displays warnings when a plugin uses class inheritance
- Documentation updates

Other

- Updated test CI coverage

3.0.10 release notes

What's new in 3.0.10

- Improved Python 3 compatibility
- Improved the behaviour when changing the operator's language
- Numerous documentation updates

Bug Fixes

- Revert a change that caused an issue with saving plugins in some browsers
- Fix an issue where URLs were not refreshed when a page slug changes
- Fix an issue with FR translations
- Fixed an issue preventing the correct rendering of custom contextual menu items for plugins
- Fixed an issue relating to recovering deleted pages
- Fixed an issue that caused the uncached placeholder tag to display cached content
- Fixed an issue where extra slashed would appear in apphooked URLs when APPEND_SLASH=False
- Fixed issues relating to the logout function

3.0.9 release notes

What's new in 3.0.9

Bug Fixes

- Revert a change that caused a regression in toolbar login
- Fix an error in a translated phrase
- Fix error when moving items in the page tree

3.0.8 release notes

What's new in 3.0.8

- Add *require_parent* option to `CMS_PLACEHOLDER_CONF`

Bug Fixes

- Fix django-mptt version dependency to be PEP440 compatible
- Fix some Django 1.4 compatibility issues
- Add toolbar sanity check
- Fix behaviour with CMSPluginBase.get_render_template()
- Fix issue on django >= 1.6 with page form fields.
- Resolve jQuery namespace issues in admin page tree and change form
- Fix issues for PageField in Firefox/Safari
- Fix some Python 3.4 compatibility issue when using proxy modules
- Fix corner case in plugin copy
- Documentation fixes
- Minor code clean-ups

Warning: Fix for plugin copy patches a reference leak in `cms.models.pluginmodel.CMSPlugin.copy_plugins`, which caused the original plugin object to be modified in memory. The fixed code leaves the original unaltered and returns a modified copy.

Custom plugins that called `cms.utils.plugins.copy_plugins_to` or `cms.models.pluginmodel.CMSPlugin.copy_plugins` may have relied on the incorrect behaviour. Check your code for calls to these methods. Correctly implemented calls should expect the original plugin instance to remain unaltered.

3.0.7 release notes

What's new in 3.0.7

- Numerous updates to the documentation
- Numerous updates to the tutorial
- Updates to better support South 1.0
- Adds some new, user-facing documentation

Bug Fixes

- Fixes an issue with `placeholderadmin` permissions
- Numerous fixes for minor issues with the frontend UI
- Fixes issue where the CMS would not reload pages properly if the URL contained a # symbol
- Fixes an issue relating to *limit_choices_to* in *forms.MultiValueFields*
- Fixes *PageField* to work in Django 1.7 environments

Project & Community Governance

- Updates to community and project governance documentation
- Added list of retired core developers
- Added branch policy documentation

3.0.6 release notes

What's new in 3.0.6

Django 1.7 support

As of version 3.0.6 django CMS supports Django 1.7.

Currently our migrations for Django 1.7 are in `cms/migrations_django` to allow better backward compatibility; in future releases the Django migrations will be moved to the standard `migrations` directory, with the South migrations in `south_migrations`.

To support the current arrangement you need to add the following to your `settings`:

```
MIGRATION_MODULES = {
    'cms': 'cms.migrations_django',
    'menus': 'menus.migrations_django',
}
```

Warning: Applications migrations

Any application that defines a django CMS plugin or a model that uses a PlaceholderField or depends in any way on django CMS models **must** also provide Django 1.7 migrations.

Extended Custom User Support

If you are using custom user models and use `CMS_PERMISSION = True` then be sure to check that `PageUserAdmin` and `PageUserGroup` is still in working order.

The `PageUserAdmin` class now extends dynamically from the admin class that handles the user model. This allows us to use the same `search_fields` and filters in `PageUserAdmin` as in the custom user model admin.

`CMSPlugin.get_render_template`

A new method on plugins, that returns the template during the render phase, allowing you to change the template based on any plugin attribute or context status. See /how_to/custom_plugins for more.

Simplified toolbar API for page extensions

A simpler, more compact way to extend the toolbar for page extensions: *Simplified Toolbar API*.

3.0.3 release notes

What's new in 3.0.3

New Alias Plugin

A new Alias plugin has been added. You will find in your plugins and placeholders context menu in structure mode a new entry called "Create alias". This will create a new Alias plugin in the clipboard with a reference to the original. It will render this original plugin/placeholder instead. This is useful for content that is present in more then one place.

New Context Menu API

Plugins can now change the context menus of placeholders and plugins. For more details have a look at the docs:

Extending context menus of placeholders or plugins

Apphook Permissions

Apphooks have now by default the same permissions as the page they are attached to. This means if a page has for example a login required enabled all views in the apphook will have the same behaviour.

Docs on how to disable or customise this behaviour have a look here:

Managing permissions on apphooks

3.0 release notes

What's new in 3.0

> **Warning:** Upgrading from previous versions
>
> 3.0 introduces some changes that **require** action if you are upgrading from a previous version.

Note: *See the quick upgrade guide*

New Frontend Editing

django CMS 3.0 introduces a new frontend editing system as well as a customisable Django admin skin (djangocms_admin_style).

In the new system, `Placeholders` and their plugins are no longer managed in the admin site, but only from the frontend.

In addition, the system now offer two editing views:

- **content** view, for editing the configuration and content of plugins.
- **structure** view, in which plugins can be added and rearranged.

Page titles can also be modified directly from the frontend.

New Toolbar

The toolbar's code has been simplified and its appearance refreshed. The toolbar is now a more consistent management tool for adding and changing objects. See /how_to/toolbar.

> **Warning:** Upgrading from previous versions
>
> 3.0 now requires the `django.contrib.messages` application for the toolbar to work.

New Page Types

You can now save pages as page types. If you then create a new page you may select a page type and all plugins and contents will be pre-filled.

Experimental Python 3.3 support

We've added experimental support for Python 3.3. Support for Python 2.5 has been dropped.

Better multilingual editing

Improvements in the django CMS environment for managing a multi-lingual site include:

- a built-in language chooser for languages that are not yet public.
- configurable behaviour of the admin site's language when switching between languages of edited content.

CMS_SEO_FIELDS

The setting has been **removed**, along with the SEO fieldset in admin.

- `meta_description` field's max_length is now 155 for optimal Google integration.
- `page_title` is default on top.
- `meta_keywords` field has been removed, as it no longer serves any purpose.

CMS_MENU_TITLE_OVERWRITE

New default for this setting is `True`.

Plugin fallback languages

It's now possible to specify fallback languages for a placeholder if the placeholder is empty for the current language. This must be activated in *CMS_PLACEHOLDER_CONF* per placeholder. It defaults to `False` to maintain pre-3.0 behaviour.

language_chooser

The `language_chooser` template tag now only displays languages that are public. Use the toolbar language chooser to change the language to non-public languages.

Undo and Redo

If you have `django-reversion` installed you now have **undo** and **redo** options available directly in the toolbar. These can now revert *plugin* content as well as *page* content.

Plugins removed

We have removed plugins from the core. This is not because you are not expected to use them, but because django CMS should not impose unnecessary choices about what to install upon its adopters.

The most significant of these removals is `cms.plugins.text`.

We provide `djangocms-text-ckeditor`, a CKEditor-based Text Plugin. It's available from https://github.com/django-cms/djangocms-text-ckeditor. You may of course use your preferred editor; others are available.

Furthermore, we removed the following plugins from the core and moved them into separate repositories.

Note: In order to update from the old `cms.plugins.X` to the new `djangocms_X` plugins, simply install the new plugin, remove the old `cms.plugins.X` from `settings.INSTALLED_APPS` and add the new one to it. Then run the migrations (`python manage.py migrate djangocms_X`).

File Plugin

We removed the file plugin (`cms.plugins.file`). Its new location is at:

- https://github.com/django-cms/djangocms-file

As an alternative, you could also use the following (yet you will not be able to keep your existing files from the old `cms.plugins.file`!)

- https://github.com/divio/django-filer

Flash Plugin

We removed the flash plugin (`cms.plugins.flash`). Its new location is at:

- https://github.com/divio/djangocms-flash

Googlemap Plugin

We removed the Googlemap plugin (`cms.plugins.googlemap`). Its new location is at:

- https://github.com/django-cms/djangocms-googlemap

Inherit Plugin

We removed the inherit plugin (`cms.plugins.inherit`). Its new location is at:

- https://github.com/divio/djangocms-inherit

Picture Plugin

We removed the picture plugin (`cms.plugins.picture`). Its new location is at:

- https://github.com/django-cms/djangocms-picture

Teaser Plugin

We removed the teaser plugin (`cms.plugins.teaser`). Its new location is at:

- https://github.com/divio/djangocms-teaser

Video Plugin

We removed the video plugin (`cms.plugins.video`). Its new location is at:

- https://github.com/django-cms/djangocms-video

Link Plugin

We removed the link plugin (`cms.plugins.link`). Its new location is at:

- https://github.com/django-cms/djangocms-link

Snippet Plugin

We removed the snippet plugin (`cms.plugins.snippet`). Its new location is at:

- https://github.com/django-cms/djangocms-snippet

As an alternative, you could also use the following (yet you will not be able to keep your existing files from the old `cms.plugins.snippet`!)

- https://github.com/pbs/django-cms-smartsnippets

Twitter Plugin

Twitter disabled V1 of their API, thus we've removed the twitter plugin (`cms.plugins.twitter`) completely.

For alternatives have a look at these plugins:

- https://github.com/nephila/djangocms_twitter
- https://github.com/changer/cmsplugin-twitter

Plugin Context Processors take a new argument

Plugin Context have had an argument added so that the rest of the context is available to them. If you have existing plugin context processors you will need to change their function signature to add the extra argument.

Apphooks

Apphooks have moved from the title to the page model. This means you can no longer have separate apphooks for each language. A new `application instance name` field has been added.

Note: The reverse id is not used for the namespace any more. If you used namespaced apphooks before, be sure to update your pages and fill out the namespace fields.

If you use apphook apps with `app_name` for app namespaces, be sure to fill out the instance namespace field `application instance name` as it's now required to have a namespace defined if you use app namespaces.

For further reading about application namespaces, please refer to the Django documentation on the subject at https://docs.djangoproject.com/en/dev/topics/http/urls/#url-namespaces

`request.current_app` has been removed. If you relied on this, use the following code instead in your views:

```
def my_view(request):
  current_app = resolve(request.path_info).namespace
  context = RequestContext(request, current_app=current_app)
  return render_to_response("my_templace.html", context_instance=context)
```

Details can be found in *Attaching an application multiple times*.

`PlaceholderAdmin`

`PlaceholderAdmin` now is deprecated. Instead of deriving from `admin.ModelAdmin`, a new mixin class `PlaceholderAdminMixin` has been introduced which shall be used together with `admin.ModelAdmin`. Therefore when defining a model admin class containing a placeholder, now add `PlaceholderAdminMixin` to the list of parent classes, together with `admin.ModelAdmin`.

`PlaceholderAdmin` doesn't have language tabs any more and the plugin editor is gone. The plugin API has changed and is now more consistent. `PageAdmin` uses the same API as `PlaceholderAdminMixin` now. If your app talked with the Plugin API directly be sure to read the code and the changed parameters. If you use `PlaceholderFields` you should add the mixin `PlaceholderAdminMixin` as it delivers the API for editing the plugins and the placeholders.

The workflow in the future should look like this:

1. Create new model instances via a toolbar entry or via the admin.
2. Go to the view that represents the model instance and add content via frontend editing.

Placeholder object permissions

In addition to model level permissions, `Placeholder` now checks if a user has permissions on a specific object of that model. Details can be found here in *Permissions*.

Placeholders are pre-fillable with default plugins

In CMS_PLACEHOLDER_CONF, for each placeholder configuration, you can specify via 'default_plugins' a list of plugins to automatically add to the placeholder if empty. See *default_plugins in CMS_PLACEHOLDER_CONF*.

Custom modules and plugin labels in the toolbar UI

It's now possible to configure module and plugins labels to show in the toolbar UI. See *`CMS_PLACEHOLDER_CONF`* for details.

New `copy-lang` subcommand

Added a management command to copy content (titles and plugins) from one language to another.

The command can be run with:

```
manage.py cms copy_lang from_lang to_lang
```

Please read *cms copy lang* before using.

Frontend editor for Django models

Frontend editor is available for any Django model; see *documentation* for details.

New `Page related_name` to `Site`

The `Page` object used to have the default `related_name` (`page`) to the `Site` model which may cause clashing with other Django apps; the `related_name` is now `djangocms_pages`.

> **Warning:** Potential backward incompatibility
>
> This change may cause you code to break, if you relied on `Site.page_set` to access cms pages from a `Site` model instance: update it to use `Site.djangocms_pages`

Moved all template tags to `cms_tags`

All template tags are now in the `cms_tags` namespace so to use any cms template tags you can just do:

```
{% load cms_tags %}
```

`getter` and `setter` for translatable plugin content

A plugin's translatable content can now be read and set through `get_translatable_content()` and `set_translatable_content()`. See *Custom Plugins* for more info.

No more DB table-name magic for plugins

Since django CMS 2.0 plugins had their table names start with *cmsplugin_*. We removed this behaviour in 3.0 and will display a deprecation warning with the old and new table name. If your plugin uses south for migrations create a new empty schema migration and rename the table by hand.

> **Warning:** When working in the django shell or coding at low level, you **must** trigger the backward compatible behaviour (a.k.a. magical rename checking), otherwise non migrated plugins will fail. To do this execute the following code:
>
> ```
> >>> from cms.plugin_pool import plugin_pool
> >>> plugin_pool.set_plugin_meta()
> ```
>
> This code can be executed both in the shell or in your python modules.

Added support for custom user models

Since Django 1.5 it has been possible to swap out the default User model for a custom user model. This is now fully supported by DjangoCMS, and in addition a new option has been added to the test runner to allow specifying the user model to use for tests (e.g. `--user=customuserapp.User`)

Page caching

Pages are now cached by default. You can disable this behaviour with *CMS_PAGE_CACHE*

Placeholder caching

Plugins have a new default property: *cache=True*. If all plugins in a placeholder have set this to `True` the whole placeholder will be cached if the toolbar is not in edit mode.

> **Warning:** If your plugin is dynamic and processes current user or request data be sure to set `cache=False`

Plugin caching

Plugins have a new attribute: `cache=True`. Its default value can be configured with *CMS_PLUGIN_CACHE*.

Per-page Clickjacking protection

An advanced option has been added which controls, on a per-page basis, the `X-Frame-Options` header. The default setting is to inherit from the parent page. If no ancestor specifies a value, no header will be set, allowing Django's own middleware to handle it (if enabled).

CMS_TEMPLATE context variable

A new `CMS_TEMPLATE` variable is now available in the context: it contains the path to the current page template. See *CMS_TEMPLATE reference* for details.

Upgrading from 2.4

Note: There are reports that upgrading the CMS from 2.4 to 3.0 may fail if Django Debug Toolbar is installed. Please remove/disable Django Debug Toolbar and other non-essential apps before attempting to upgrade, then once complete, re-enable them following the "Explicit setup" instructions.

If you want to upgrade from version 2.4 to 3.0, there's a few things you need to do. Start of by updating the cms' package:

```
pip install django-cms==3.0
```

Next, you need to make the following changes in your `settings.py`

- `settings.INSTALLED_APPS`
  - Remove `cms.plugin.twitter`. This package has been deprecated, see *Twitter Plugin*.
  - Rename all the other `cms.plugins.X` to `djangocms_X`, see *Plugins removed*.
- settings.CONTEXT_PROCESSORS
  - Replace `cms.context_processors.media` with `cms.context_processors.cms_settings`

Afterwards, install all your previously renamed ex-core plugins (`djangocms-whatever`). Here's a full list, but you probably don't need all of them:

```
pip install djangocms-file
pip install djangocms-flash
pip install djangocms-googlemap
pip install djangocms-inherit
pip install djangocms-picture
pip install djangocms-teaser
pip install djangocms-video
pip install djangocms-link
pip install djangocms-snippet
```

Also, please check your templates to make sure that you haven't put the `{% cms_toolbar %}` tag into a `{% block %}` tag. This is not allowed in 3.0 any more.

To finish up, please update your database:

```
python manage.py syncdb
python manage.py migrate  (answer yes if your prompted to delete stale content types)
```

Finally, your existing pages will be unpublished, so publish them with the `publisher` command:

```
python manage.py publisher_publish
```

That's it!

Pending deprecations

placeholder_tags

`placeholder_tags` is now deprecated, the `render_placeholder` template tag can now be loaded from the `cms_tags` template tag library.

Using `placeholder_tags` will cause a `DeprecationWarning` to occur.

`placeholder_tags` will be removed in version 3.1.

cms.context_processors.media

`cms.context_processors.media` is now deprecated, please use `cms.context_processors.cms_settings` by updating `TEMPLATE_CONTEXT_PROCESSORS` in the settings

Using `cms.context_processors.media` will cause a `DeprecationWarning` to occur.

`cms.context_processors.media` will be removed in version 3.1.

2.4 release notes

What's new in 2.4

> **Warning:** Upgrading from previous versions
>
> 2.4 introduces some changes that **require** action if you are upgrading from a previous version.
>
> You will need to read the sections *Migrations overhaul* and *Added a check command* below.

Introducing Django 1.5 support, dropped support for Django 1.3 and Python 2.5

Django CMS 2.4 introduces Django 1.5 support.

In django CMS 2.4 we dropped support for Django 1.3 and Python 2.5. Django 1.4 and Python 2.6 are now the minimum required versions.

Migrations overhaul

In version 2.4, migrations have been completely rewritten to address issues with newer South releases.

To ease the upgrading process, all the migrations for the *cms* application have been consolidated into a single migration file, *0001_initial.py*.

- migration 0001 is a *real* migration, that gets you to the same point migrations 0001-0036 used to
- the migrations 0002 to 0036 inclusive still exist, but are now all *dummy* migrations
- migrations 0037 and later are *new* migrations

How this affects you

If you're starting with *a new installation*, you don't need to worry about this. Don't even bother reading this section; it's for upgraders.

If you're using version *2.3.2 or newer*, you don't need to worry about this either.

If you're using version *2.3.1 or older*, you will need to run a two-step process.

First, you'll need to upgrade to 2.3.3, to bring your migration history up-to-date with the new scheme. Then you'll need to perform the migrations for 2.4.

For the two-step upgrade process do the following in your project main directory:

```
pip install django-cms==2.3.3
python manage.py syncdb
python manage.py migrate
pip install django-cms==2.4
python manage.py migrate
```

Added delete orphaned plugins command

Added a management command for deleting orphaned plugins from the database.

The command can be run with:

```
manage.py cms delete_orphaned_plugins
```

Please read *cms delete-orphaned-plugins* before using.

Added a check command

Added a management command to check your configuration and environment.

To use this command, simply run:

manage.py cms check

This replaces the old at-runtime checks.

CMS_MODERATOR

Has been removed since it is no longer in use. From 2.4 onward, all pages exist in a public and draft version. Users with the `publish_page` permission can publish changes to the public site.

Management command required

To bring a previous version of your site's database up-to-date, you'll need to run `manage.py cms moderator on`. **Never run this command without first checking for orphaned plugins**, using the `cms list plugins` command. If it reports problems, run `manage.py cms delete_orphaned_plugins`. Running `cms moderator` with orphaned plugins will fail and leave bad data in your database. See *cms list* and *cms delete-orphaned-plugins*.

Also, check that all your plugins define a `copy_relations()` method if required. You can do this by running `manage.py cms check` and read the *Presence of "copy_relations"* section. See *Handling Relations* for guidance on this topic.

Added Fix MPTT Management command

Added a management command for fixing MPTT tree data.

The command can be run with:

```
manage.py cms fix-mptt
```

Removed the MultilingualMiddleware

We removed the MultilingualMiddleware. This removed rather some unattractive monkey-patching of the `reverse()` function as well. As a benefit we now support localisation of URLs and apphook URLs with standard Django helpers.

For django 1.4 more information can be found here:

> https://docs.djangoproject.com/en/dev/topics/i18n/translation/#internationalization-in-url-patterns

If you are still running django 1.3 you are able to achieve the same functionality with django-i18nurl. It is a backport of the new functionality in django 1.4 and can be found here:

> https://github.com/brocaar/django-i18nurls

What you need to do:

- Remove `cms.middleware.multilingual.MultilingualURLMiddleware` from your settings.
- Be sure `django.middleware.locale.LocaleMiddleware` is in your settings, and that it comes after the SessionMiddleware.
- Be sure that the `cms.urls` is included in a `i18n_patterns`:

```
from django.conf.urls.i18n import i18n_patterns
from django.contrib import admin
from django.conf import settings
from django.urls import *

admin.autodiscover()

urlpatterns = i18n_patterns('',
    re_path(r'^admin/', include(admin.site.urls)),
```

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```
    re_path(r'^', include('cms.urls')),
)

if settings.DEBUG:
    urlpatterns = patterns('',
    re_path(r'^media/(?P<path>.*)$', 'django.views.static.serve',
            {'document_root': settings.MEDIA_ROOT, 'show_indexes': True}),
    re_path(r'', include('django.contrib.staticfiles.urls')),
) + urlpatterns
```

- Change your url and reverse calls to language namespaces. We now support the django way of calling other language urls either via `{% language %}` template tag or via `activate("de")` function call in views.

  Before:

  ```
  {% url "de:myview" %}
  ```

  After:

  ```
  {% load i18n %}{% language "de" %}
  {% url "myview_name" %}
  {% endlanguage %}
  ```

- reverse urls now return the language prefix as well. So maybe there is some code that adds language prefixes. Remove this code.

Added LanguageCookieMiddleware

To fix the behaviour of django to determine the language every time from new, when you visit / on a page, this middleware saves the current language in a cookie with every response.

To enable this middleware add the following to your *MIDDLEWARE_CLASSES* setting:

cms.middleware.language.LanguageCookieMiddleware

CMS_LANGUAGES

CMS_LANGUAGES has be overhauled. It is no longer a list of tuples like the `LANGUAGES` settings.

An example explains more than thousand words:

```
CMS_LANGUAGES = {
        1: [
            {
                'code': 'en',
                'name': gettext('English'),
                'fallbacks': ['de', 'fr'],
                'public': True,
                'hide_untranslated': True,
                'redirect_on_fallback':False,
            },
            {
```

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```
                'code': 'de',
                'name': gettext('Deutsch'),
                'fallbacks': ['en', 'fr'],
                'public': True,
            },
            {
                'code': 'fr',
                'name': gettext('French'),
                'public': False,
            },
        ],
        2: [
            {
                'code': 'nl',
                'name': gettext('Dutch'),
                'public': True,
                'fallbacks': ['en'],
            },
        ],
        'default': {
            'fallbacks': ['en', 'de', 'fr'],
            'redirect_on_fallback':True,
            'public': False,
            'hide_untranslated': False,
        }
    }
```

For more details on what all the parameters mean please refer to the *CMS_LANGUAGES* docs.

The following settings are not needed any more and have been removed:

- *CMS_HIDE_UNTRANSLATED*
- *CMS_LANGUAGE_FALLBACK*
- *CMS_LANGUAGE_CONF*
- *CMS_SITE_LANGUAGES*
- *CMS_FRONTEND_LANGUAGES*

Please remove them from your `settings.py`.

CMS_FLAT_URLS

Was marked deprecated in 2.3 and has now been removed.

Plugins in Plugins

We added the ability to have plugins in plugins. Until now only the TextPlugin supported this. For demonstration purposes we created a MultiColumn Plugin. The possibilities for this are endless. Imagine: StylePlugin, TablePlugin, GalleryPlugin etc.

The column plugin can be found here:

> https://github.com/divio/djangocms-column

At the moment the limitation is that plugins in plugins is only editable in the frontend.

Here is the MultiColumn Plugin as an example:

```
class MultiColumnPlugin(CMSPluginBase):
    model = MultiColumns
    name = _("Multi Columns")
    render_template = "cms/plugins/multi_column.html"
    allow_children = True
    child_classes = ["ColumnPlugin"]
```

There are 2 new properties for plugins:

allow_children

Boolean If set to True it allows adding Plugins.

child_classes

List A List of Plugin Classes that can be added to this plugin. If not provided you can add all plugins that are available in this placeholder.

How to render your child plugins in the template

We introduce a new template tag in the cms_tags called `{% render_plugin %}` Here is an example of how the MultiColumn plugin uses it:

```
{% load cms_tags %}
<div class="multicolumn">
{% for plugin in instance.child_plugins %}
    {% render_plugin plugin %}
{% endfor %}
</div>
```

As you can see the children are accessible via the plugins children attribute.

New way to handle django CMS settings

If you have code that needs to access django CMS settings (settings prefixed with `CMS_` or `PLACEHOLDER_`) you would have used for example `from django.conf import settings; settings.CMS_TEMPLATES`. This will no longer guarantee to return sane values, instead you should use `cms.utils.conf.get_cms_setting` which takes the name of the setting **without** the `CMS_` prefix as argument and returns the setting.

Example of old, now deprecated style:

```
from django.conf import settings

settings.CMS_TEMPLATES
settings.PLACEHOLDER_FRONTEND_EDITING
```

Should be replaced with the new API:

```
from cms.utils.conf import get_cms_setting

get_cms_setting('TEMPLATES')
get_cms_setting('PLACEHOLDER_FRONTEND_EDITING')
```

Added `cms.constants` module

This release adds the `cms.constants` module which will hold generic django CMS constant values. Currently it only contains `TEMPLATE_INHERITANCE_MAGIC` which used to live in `cms.conf.global_settings` but was moved to the new `cms.constants` module in the settings overhaul mentioned above.

django-reversion integration changes

django-reversion integration has changed. Because of huge databases after some time we introduce some changes to the way revisions are handled for pages.

1. Only publish revisions are saved. All other revisions are deleted when you publish a page.
2. By default only the latest 25 publish revisions are kept. You can change this behaviour with the new *CMS_MAX_PAGE_PUBLISH_REVERSIONS* setting.

Changes to the show_sub_menu template tag

The *show_sub_menu* has received two new parameters. The first stays the same and is still: how many levels of menu should be displayed.

The second: `root_level` (default=None), specifies at what level, if any, the menu should root at. For example, if root_level is 0 the menu will start at that level regardless of what level the current page is on.

The third argument: `nephews` (default=100), specifies how many levels of nephews (children of siblings) are shown.

PlaceholderAdmin support i18n

If you use placeholders in other apps or models we now support more than one language out of the box. If you just use `PlaceholderAdmin` it will display language tabs like the cms. If you use django-hvad it uses the hvad language tabs.

If you want to disable this behaviour you can set `render_placeholder_language_tabs = False` on your Admin class that extends PlaceholderAdmin. If you use a custom `change_form_template` be sure to have a look at `cms/templates/admin/placeholders/placeholder/change_form.html` for how to incorporate language tabs.

Added CMS_RAW_ID_USERS

If you have a lot of users (500+) you can set this setting to a number after which admin User fields are displayed in a raw Id field. This improves performance a lot in the admin as it has not to load all the users into the html.

Backwards incompatible changes

New minimum requirements for dependencies

- Django 1.3 and Python 2.5 are no longer supported.

Pending deprecations

- `simple_language_changer` will be removed in version 3.0. A bug-fix makes this redundant as every non-managed URL will behave like this.

2.3.4 release notes

What's new in 2.3.4

WymEditor fixed

2.3.4 fixes a critical issue with WymEditor that prevented it from load it's JavaScript assets correctly.

Moved Norwegian translations

The Norwegian translations are now available as `nb`, which is the new (since 2003) official language code for Norwegian, replacing the older and deprecated `no` code.

If your site runs in Norwegian, you need to change your `LANGUAGES` settings!

Added support for time zones

On Django 1.4, and with `USE_TZ=True` the django CMS now uses time zone aware date and time objects.

Fixed slug clashing

In earlier versions, publishing a page that has the same slug (URL) as another (published) page could lead to errors. Now, when a page which would have the same URL as another (published) page is published, the user is shown an error and they're prompted to change the slug for the page.

Prevent unnamed related names for PlaceholderField

`cms.models.fields.PlaceholderField` no longer allows the related name to be suppressed. Trying to do so will lead to a `ValueError`. This change was done to allow the django CMS to properly check permissions on Placeholder Fields.

Two fixes to page change form

The change form for pages would throw errors if the user editing the page does not have the permission to publish this page. This issue was resolved.

Further the page change form would not correctly pre-populate the slug field if `DEBUG` was set to `False`. Again, this issue is now resolved.

2.3.3 release notes

What's new in 2.3.3

Restored Python 2.5 support

2.3.3 restores Python 2.5 support for the django CMS.

Pending deprecations

Python 2.5 support will be dropped in django CMS 2.4.

2.3.2 release notes

What's new in 2.3.2

Google map plugin

Google map plugin now supports width and height fields so that plugin size can be modified in the page admin or frontend editor.

Zoom level is now set via a select field which ensure only legal values are used.

> **Warning:** Due to the above change, *level* field is now marked as *NOT NULL*, and a data migration has been introduced to modify existing Googlemap plugin instance to set the default value if *level* if is *NULL*.

2.3 release notes

What's new in 2.3

Introducing Django 1.4 support, dropped support for Django 1.2

In django CMS 2.3 we dropped support for Django 1.2. Django 1.3.1 is now the minimum required Django version. Django CMS 2.3 also introduces Django 1.4 support.

Lazy page tree loading in admin

Thanks to the work by Andrew Schoen the page tree in the admin now loads lazily, significantly improving the performance of that view for large sites.

Toolbar isolation

The toolbar JavaScript dependencies should now be properly isolated and no longer pollute the global JavaScript namespace.

Plugin cancel button fixed

The cancel button in plugin change forms no longer saves the changes, but actually cancels.

Tests refactor

Tests can now be run using `setup.py test` or `runtests.py` (the latter should be done in a virtualenv with the proper dependencies installed).

Check `runtests.py -h` for options.

Moving text plugins to different placeholders no longer loses inline plugins

A serious bug where a text plugin with inline plugins would lose all the inline plugins when moved to a different placeholder has been fixed.

Minor improvements

- The `or` clause in the `placeholder` tag now works correctly on non-cms pages.
- The icon source URL for inline plugins for text plugins no longer gets double escaped.
- `PageSelectWidget` correctly orders pages again.
- Fixed the file plugin which was sometimes causing invalid HTML (unclosed `span` tag).
- Migration ordering for plugins improved.
- Internationalised strings in JavaScript now get escaped.

Backwards incompatible changes

New minimum requirements for dependencies

- `django-reversion` must now be at version 1.6
- `django-sekizai` must be at least at version 0.6.1
- `django-mptt` version 0.5.1 or 0.5.2 is required

Registering a list of plugins in the plugin pool

This feature was deprecated in version 2.2 and removed in 2.3. Code like this will not work any more:

```
plugin_pool.register_plugin([FooPlugin, BarPlugin])
```

Instead, use multiple calls to `register_plugin`:

```
plugin_pool.register_plugin(FooPlugin)
plugin_pool.register_plugin(BarPlugin)
```

Pending deprecations

The `CMS_FLAT_URLS` setting is deprecated and will be removed in version 2.4. The moderation feature (`CMS_MODERATOR = True`) will be deprecated in 2.4 and replaced with a simpler way of handling unpublished changes.

2.2 release notes

What's new in 2.2

`django-mptt` now a proper dependency

django-mptt is now used as a proper dependency and is no longer shipped with the django CMS. This solves the version conflict issues many people were experiencing when trying to use the django CMS together with other Django apps that require django-mptt. django CMS 2.2 requires django-mptt 0.5.1.

> **Warning:** Please remove the old `mptt` package from your Python site-packages directory before upgrading. The `setup.py` file will install the django-mptt package as an external dependency!

Django 1.3 support

The django CMS 2.2 supports both Django 1.2.5 and Django 1.3.

View permissions

You can now give view permissions for django CMS pages to groups and users.

Backwards incompatible changes

`django-sekizai` instead of PluginMedia

Due to the sorry state of the old plugin media framework, it has been dropped in favour of the more stable and more flexible django-sekizai, which is a new dependency for the django CMS 2.2.

The following methods and properties of *`cms.plugin_base.CMSPluginBase`* are affected:

- `cms.plugins_base.CMSPluginBase.PluginMedia`
- `cms.plugins_base.CMSPluginBase.pluginmedia`
- `cms.plugins_base.CMSPluginBase.get_plugin_media`

Accessing those attributes or methods will raise a `cms.exceptions.Deprecated` error.

The `cms.middleware.media.PlaceholderMediaMiddleware` middleware was also removed in this process and is therefore no longer required. However you are now required to have the `sekizai.context_processors.sekizai` context processor in your `TEMPLATE_CONTEXT_PROCESSORS` setting.

All templates in *`CMS_TEMPLATES`* must at least contain the `js` and `css` sekizai namespaces.

Please refer to the documentation on *Handling media* in custom CMS plugins and the django-sekizai documentation for more information.

Toolbar must be enabled explicitly in templates

The toolbar no longer hacks itself into responses in the middleware, but rather has to be enabled explicitly using the `{% cms_toolbar %}` template tag from the `cms_tags` template tag library in your templates. The template tag should be placed somewhere within the body of the HTML (within `<body>...</body>`).

This solves issues people were having with the toolbar showing up in places it shouldn't have.

Static files moved to /static/

The static files (CSS/JavaScript/images) were moved from `/media/` to `/static/` to work with the new `django.contrib.staticfiles` app in Django 1.3. This means you will have to make sure you serve static files as well as media files on your server.

> **Warning:** If you use Django 1.2.x you will not have a `django.contrib.staticfiles` app. Instead you need the django-staticfiles backport.

Features deprecated in 2.2

`django-dbgettext` support

The django-dbgettext support has been fully dropped in 2.2 in favour of the built-in multi-lingual support mechanisms.

Upgrading from 2.1.x and Django 1.2.x

Upgrading dependencies

Upgrade both your version of django CMS and Django by running the following commands.

```
pip install --upgrade django-cms==2.2 django==1.3.1
```

If you are using django-reversion make sure to have at least version 1.4 installed

```
pip install --upgrade django-reversion==1.4
```

Also, make sure that django-mptt stays at a version compatible with django CMS

```
pip install --upgrade django-mptt==0.5.1
```

Updates to `settings.py`

The following changes will need to be made in your `settings.py` file:

```
ADMIN_MEDIA_PREFIX = '/static/admin'
STATIC_ROOT = os.path.join(PROJECT_PATH, 'static')
STATIC_URL = "/static/"
```

> **Note:** These are not django CMS settings. Refer to the Django documentation on staticfiles for more information.

> **Note:** Please make sure the `static` sub-folder exists in your project and is writeable.

> **Note:** PROJECT_PATH is the absolute path to your project.

Remove the following from TEMPLATE_CONTEXT_PROCESSORS:

> django.core.context_processors.auth

Add the following to TEMPLATE_CONTEXT_PROCESSORS:

```
django.contrib.auth.context_processors.auth
django.core.context_processors.static
sekizai.context_processors.sekizai
```

Remove the following from MIDDLEWARE_CLASSES:

```
cms.middleware.media.PlaceholderMediaMiddleware
```

Remove the following from INSTALLED_APPS:

```
publisher
```

Add the following to INSTALLED_APPS:

```
sekizai
django.contrib.staticfiles
```

Template Updates

Make sure to add sekizai tags and `cms_toolbar` to your CMS templates.

Note: `cms_toolbar` is only needed if you wish to use the front-end editing. See *Backwards incompatible changes* for more information

---

Here is a simple example for a base template called `base.html`:

```
{% load cms_tags sekizai_tags %}
<html>
  <head>
      {% render_block "css" %}
  </head>
  <body>
      {% cms_toolbar %}
      {% placeholder base_content %}
      {% block base_content%}{% endblock %}
      {% render_block "js" %}
  </body>
</html>
```

Database Updates

Run the following commands to upgrade your database

```
python manage.py syncdb
python manage.py migrate
```

Static Media

Add the following to `urls.py` to serve static media when developing:

```
if settings.DEBUG:
    urlpatterns = patterns('',
    re_path(r'^media/(?P<path>.*)$', 'django.views.static.serve',
            {'document_root': settings.MEDIA_ROOT, 'show_indexes': True}),
    re_path(r'', include('django.contrib.staticfiles.urls')),
) + urlpatterns
```

Also run this command to collect static files into your `STATIC_ROOT`:

```
python manage.py collectstatic
```

5.2.6 Contribute

django CMS is an open-source project, and relies on its community of users to keep getting better.

The contributors to django CMS come from across the world, and have a wide range and levels of skills and expertise. Every contribution, however small, is valued.

As an open source project, anyone is welcome to contribute in whatever form they are able, which can include taking part in discussions, filing bug reports, proposing improvements, contributing code or documentation, and testing the

Contribute to django CMS

As an open source project, django CMS is only as strong as its community. Without the donation of time and skill of our contributors and the financial support of our association members it would not be possible to maintain the django CMS project. The community is the backbone of django CMS.

Our contributors come from all over the world and have different levels of skills and expertise. No matter if you are a developer, usability enthusiast, designer or copywriter. Young or old. Experienced or inexperienced. Every contribution, however small, is valued.

You don't need to be an expert developer to make a valuable contribution - all you need is a little knowledge of the system, and a willingness to follow the contribution guidelines.

Open source contribution can include taking part in discussions, filing bug reports, proposing improvements, contributing code or writing documentation.

Remember that contributions to the documentation are highly prized, and key to the success of the django CMS project.

All activity in the community is governed by our *Code of Conduct*.

3 Reasons Why You Should Contribute

1. Boost your reputation

Through your involvement as a contributor, other people become aware of your work. In this way, you make a name for yourself in the community and your reputation grows. This can also help you in your professional career. Add your contribution to your resume or LinkedIn profile.

2. Find a mentor and improve your skills

When you join a workgroup, you will receive guidance and support from the workgroup leader. Our working group leaders are professionals in their field and often in leading positions in their respective companies. Take advantage of this unique opportunity for personal development!

3. Meet new people and increase your network

Let's face it: Ultimately, it's the people who bring the django CMS project to life and fill it with joy. Through your involvement, you'll meet new people and maybe even make new friends. As a community, it's important to us to create a pleasant atmosphere where everyone feels welcome!

Are you new to django CMS?

If you are new to django CMS, then we recommend you to first familiarize yourself with the CMS and start with the install section. After that, you can have a go at issues on Github that are marked Good first issue. These issues are especially good if you're just starting out but still want to contribute.

Contributor Community

But before you start getting your hands dirty, you should make sure to join us online in order to stay updated with the latest news and to connect with other users across the world.

You can join us online:

- in our django CMS Slack channel
- on StackOverflow

You should make sure to join our Slack workspace. It is our main communication platform. Users from all over the world use Slack to talk about django CMS and to support each other in answering support requests. StackOverflow is a very popular, community-based space to find and contribute answers to technical challenges

You can also follow:

- the @djangocms Twitter account for general announcements
- the django CMS Association LinkedIn account

How to contribute

Contributing code

Like every open-source project, django CMS is always looking for motivated individuals to contribute to its source code.

In a nutshell

Here's what the contribution process looks like in brief:

1. Fork our GitHub repository, https://github.com/django-cms/django-cms
2. Work locally and push your changes to your repository.
3. When you feel your code is good enough for inclusion, send us a pull request.
4. After that, please join the **`Slack Channel`_** of our Pull Request Review work group (#workgroup-pr-review). This group of friendly community members is dedicated to reviewing pull requests. Report your PR and find a "pr review buddy" who is going to review your pull request.
5. Get acknowledged by the django CMS community for your contribution

See the contributing_patch how-to document for a walk-through of this process.

Basic requirements and standards

If you're interested in developing a new feature for the CMS, it is recommended that you first discuss it on the Slack channel so as not to do any work that will not get merged in anyway.

- Code will be reviewed and tested by at least one core developer, preferably by several. Other community members are welcome to give feedback.
- Code *must* be tested. Your pull request should include unit-tests (that cover the piece of code you're submitting, obviously)
- Documentation should reflect your changes if relevant. There is nothing worse than invalid documentation.
- Usually, if unit tests are written, pass, and your change is relevant, then it'll be merged.

Since we're hosted on GitHub, django CMS uses git as a version control system.

The GitHub help is very well written and will get you started on using git and GitHub in a jiffy. It is an invaluable resource for newbies and old timers alike.

Syntax and conventions

Python

We try to conform to PEP8 as much as possible. A few highlights:

- Indentation should be exactly 4 spaces. Not 2, not 6, not 8. **4**. Also, tabs are evil.
- We try (loosely) to keep the line length at 79 characters. Generally the rule is "it should look good in a terminal-base editor" (eg vim), but we try not be too inflexible about it.

HTML, CSS and JavaScript

As of django CMS 3.2, we are using the same guidelines as described in Aldryn Boilerplate

Frontend code should be formatted for readability. If in doubt, follow existing examples, or ask.

JS Linting

JavaScript is linted using ESLint. In order to run the linter you need to do this:

```
gulp lint
```

Or you can also run the watcher by just running `gulp`.

Process

This is how you fix a bug or add a feature:

1. fork us on GitHub.
2. Checkout your fork.
3. *Hack hack hack*, *test test test*, *commit commit commit*, test again.
4. Push to your fork.
5. Open a pull request.

And at any point in that process, you can add: *discuss discuss discuss*, because it's always useful for everyone to pass ideas around and look at things together.

testing is really important: a pull request that lowers our testing coverage will only be accepted with a very good reason; bug-fixing patches **must** demonstrate the bug with a test to avoid regressions and to check that the fix works.

We have a **`Slack Channel`_** and of course the code reviews mechanism on GitHub - do use them.

Frontend

Important: When we refer to the *frontend* here, we **only** mean the frontend of django CMS's admin/editor interface.

The frontend of a django CMS website, as seen by its visitors (i.e. the published site), is *wholly independent of this*. django CMS places almost no restrictions at all on the frontend - if a site can be described in HTML/CSS/JavaScript, it can be developed in django CMS.

In order to be able to work with the frontend tooling contributing to the django CMS you need to have the following dependencies installed:

1. Node version 18.19.0 (will install npm 10.2.3 as well). We recommend using NVM to get the correct version of Node.
2. gulp - see Gulp's Getting Started notes
3. Local dependencies `npm install`

Styles

We use Sass for our styles. The files are located within `cms/static/cms/sass` and can be compiled using the libsass implementation of Sass compiler through gulp.

In order to compile the stylesheets you need to run this command from the repo root:

```
gulp sass
```

While developing it is also possible to run a watcher that compiles Sass files on change:

```
gulp
```

By default, source maps are not included in the compiled files. In order to turn them on while developing just add the `--debug` option:

```
gulp --debug
```

Icons

We are using gulp-iconfont to generate icon web fonts into `cms/static/cms/fonts/`. This also creates `_iconography.scss` within `cms/static/cms/sass/components` which adds all the icon classes and ultimately compiles to CSS.

In order to compile the web font you need to run:

```
gulp icons
```

This simply takes all SVGs within `cms/static/cms/fonts/src` and embeds them into the web font. All classes will be automatically added to `_iconography.scss` as previously mentioned.

Additionally we created an SVG template within `cms/static/cms/font/src/_template.svgz` that you should use when converting or creating additional icons. It is named *svgz* so it doesn't get compiled into the font. When using *Adobe Illustrator* please mind the following settings.

JS Bundling

JavaScript files are split up for easier development, but in the end they are bundled together and minified to decrease amount of requests made and improve performance. In order to do that we use the `gulp` task runner, where `bundle` command is available. We use Webpack for bundling JavaScript files. Configuration for each bundle are stored inside the `webpack.config.js` and their respective entry points. CMS exposes only one global variable, named `CMS`. If you want to use JavaScript code provided by CMS in external applications, you can only use bundles distributed by CMS, not the source modules.

Contributing documentation

Perhaps considered "boring" by hard-core coders, documentation is sometimes even more important than code! This is what brings fresh blood to a project, and serves as a reference for old timers. On top of this, documentation is the one area where less technical people can help most - you just need to write simple, unfussy English. Elegance of style is a secondary consideration, and your prose can be improved later if necessary.

Contributions to the documentation earn the greatest respect from the core developers and the django CMS community.

Documentation should be:

- written using valid Sphinx/restructuredText syntax (see below for specifics); the file extension should be `.rst`
- wrapped at 100 characters per line
- written in English, using British English spelling and punctuation
- accessible - you should assume the reader to be moderately familiar with Python and Django, but not anything else. Link to documentation of libraries you use, for example, even if they are "obvious" to you

Merging documentation is pretty fast and painless.

Except for the tiniest of change, we recommend that you test them before submitting.

Building the documentation

Follow the same steps above to fork and clone the project locally. Next, `cd` into the `django-cms/docs` and install the requirements:

```
make install
```

Now you can test and run the documentation locally using:

```
make run
```

This allows you to review your changes in your local browser using `http://localhost:8001/`.

Note: What this does

`make install` is roughly the equivalent of:

```
virtualenv env
source env/bin/activate
pip install -r requirements.txt
cd docs
make html
```

`make run` runs `make html`, and serves the built documentation on port 8001 (that is, at `http://localhost:8001/`.

It then watches the `docs` directory; when it spots changes, it will automatically rebuild the documentation, and refresh the page in your browser.

Documentation requirements

The packages required by the documentation are managed by pip-tools, which compiles `requirements.txt` ensuring compatibility between packages.

The packages that the documentation requires are in `requirements.in` which looks like a regular requirements file. Specific versions of packages can be specified, or left without a version in which case the latest version which is compatible with the other packages will be used.

Example `requirements.in`:

```
furo
Sphinx>4
sphinx-copybutton
sphinxext-opengraph
sphinxcontrib-spelling
pyenchant>3
```

By running `pip-compile` the requirements are compiled into `requirements.txt`.

Periodically requirements should be updated to ensure that new versions, most importantly security patches, are used. This is done using the `-U` flag:

```
cd docs
pip-compile -U
```

The generated `requirements.txt` pins specific versions and explains where each required package comes from, for example:

```
datetime==4.3
    # via -r requirements.in
django==3.2.5
    # via
    #   django-classy-tags
    #   django-cms
    #   django-formtools
    #   django-sekizai
    #   django-treebeard
django-classy-tags==2.0.0
    # via
    #   django-cms
    #   django-sekizai
django-cms==3.9.0
    # via -r requirements.in
django-formtools==2.3
    # via django-cms
```

Spelling

We use sphinxcontrib-spelling, which in turn uses pyenchant and enchant to check the spelling of the documentation.

You need to check your spelling before submitting documentation.

Important: We use British English rather than US English spellings. This means that we use *colour* rather than *color*, *emphasise* rather than *emphasize* and so on.

Install the spelling software

`sphinxcontrib-spelling` and `pyenchant` are Python packages that will be installed in the virtualenv `docs/env` when you run `make install` (see above).

You will need to have `enchant` installed too, if it is not already. The easy way to check is to run `make spelling` from the `docs` directory. If it runs successfully, you don't need to do anything, but if not you will have to install `enchant` for your system. For example, on OS X:

```
brew install enchant
```

or Debian Linux:

```
apt-get install enchant
```

Check spelling

Run:

```
make spelling
```

in the `docs` directory to conduct the checks.

Note: This script expects to find a virtualenv at `docs/env`, as installed by `make install` (see above).

If no spelling errors have been detected, `make spelling` will report:

```
build succeeded.
```

Otherwise:

```
build finished with problems.
make: *** [spelling] Error 1
```

It will list any errors in your shell. Misspelt words will be also be listed in `build/spelling/output.txt`

Words that are not in the built-in dictionary can be added to `docs/spelling_wordlist`. **If** you are certain that a word is incorrectly flagged as misspelt, add it to the `spelling_wordlist` document, in alphabetical order. **Please do not add new words unless you are sure they should be in there.**

If you find technical terms are being flagged, please check that you have capitalised them correctly - `javascript` and `css` are **incorrect** spellings for example. Commands and special names (of classes, modules, etc) in double backticks - ``` - will mean that they are not caught by the spelling checker.

Important: You may well find that some words that pass the spelling test on one system but not on another. Dictionaries on different systems contain different words and even behave differently. The important thing is that the spelling tests pass on Travis when you submit a pull request.

Making a pull request

Before you commit any changes, you need to check spellings with `make spelling` and rebuild the docs using `make html`. If everything looks good, then it's time to push your changes to GitHub and open a pull request in the usual way.

Documentation structure

Our documentation is divided into the following main sections:

- *Tutorials* (`introduction`): step-by-step, beginning-to-end tutorials to get you up and running
- *How-to guides* (`how_to`): step-by-step guides covering more advanced development
- /topics/index (`topics`): explanations of key parts of the system
- *Reference* (`reference`): technical reference for APIs, key models and so on
- *Contribute* (`contributing`)
- *Release notes & upgrade information* (`upgrade`)
- *Who is behind django CMS* (`who`): who is behind the django CMS project

Documentation markup

Sections

We mostly follow the Python documentation conventions for section marking:

```
##########
Page title
##########

*******
heading
*******

sub-heading
===========

sub-sub-heading
---------------

sub-sub-sub-heading
^^^^^^^^^^^^^^^^^^^

sub-sub-sub-sub-heading
"""""""""""""""""""""""""""
```

Inline markup

- **use backticks - `` - for:**
  - literals:

    ```
    The ``cms.models.pagemodel`` contains several important methods.
    ```

  - filenames:

    ```
    Before you start, edit ``settings.py``.
    ```

  - names of fields and other specific items in the Admin interface:

    ```
    Edit the ``Redirect`` field.
    ```

- **use emphasis - `*Home*` - around:**
  - the names of available options in or parts of the Admin:

    ```
    To hide and show the *Toolbar*, use the...
    ```

  - the names of important modes or states:

    ```
    ... in order to switch to *Edit mode*.
    ```

  - values in or of fields:

    ```
    Enter *Home* in the field.
    ```

- **use strong emphasis - ** - around:**
  - buttons that perform an action:

    ```
    Hit **View published** or **Save as draft**.
    ```

Rules for using technical words

There should be one consistent way of rendering any technical word, depending on its context. Please follow these rules:

- in general use, simply use the word as if it were any ordinary word, with no capitalisation or highlighting: "Your placeholder can now be used."
- at the start of sentences or titles, capitalise in the usual way: "Placeholder management guide"
- when introducing the term for the the first time, or for the first time in a document, you may highlight it to draw attention to it: "**Placeholders** are special model fields".
- when the word refers specifically to an object in the code, highlight it as a literal: "`Placeholder` methods can be overwritten as required" - when appropriate, link the term to further reference documentation as well as simply highlighting it.

References

Create:

```
.. _testing:
```

and use:

```
:ref:`testing`
```

internal cross-references liberally.

Use absolute links to other documentation pages - `:doc:`/how_to/toolbar`` - rather than relative links - `:doc:`/../toolbar``. This makes it easier to run search-and-replaces when items are moved in the structure.

Contributing translations

For translators we have a Transifex account where you can translate the `.po` files and don't need to install git or mercurial to be able to contribute. All changes there will be automatically sent to the project.

Development policies

Reporting security issues

> **Attention:** If you think you have discovered a security issue in our code, please report it **privately**, by emailing us at security@django-cms.org.
>
> Please **do not** raise it in any public forum until we have had a chance to deal with it.

Review

All patches should be made as pull requests **against develop-4** to the GitHub repository. Patches should never be pushed directly.

Nothing may enter the code-base, *including the documentation*, without proper review and formal approval from the core team.

Reviews are welcomed by all members of the community. You don't need to be a core developer, or even an experienced programmer, to contribute usefully to code review. Even noting that you don't understand something in a pull request is valuable feedback and will be taken seriously.

Formal approval

Formal approval means "OK to merge" comments, following review, from at least one member of the core team who has expertise in the relevant areas, and excluding the author of the pull request.

Proposal and discussion of significant changes

New features and backward-incompatible changes should follow the best practice of DEPS and should be discussed in the community first. After your proposal has been reviewed by the community, it needs to be finally approved by the Tech Committee. This is in the interests of openness and transparency, and to give the community a chance to participate in and understand the decisions taken by the project.

So before submitting pull requests with significant changes, please make sure that the community agrees and the Technical Committee approves.

To create a proposal…

1. please use this DEP template
2. create a discussion in the main Github repository
3. discuss, discuss, discuss
4. join the Tech Committee Slack Channel (#technical-committee) and make the team aware of your proposal after the proposal has been reviewed by the Technical Committee, it is put to a vote at one of the weekly meetings of the technical committee

Release schedule

The roadmap can be found on our website. The release schedule is managed by the release management workgroup. The plan is to release quarterly and according to a retrospective approach.

Example of retrospective approach.

- Q1 2021 -> 3.9 Release
- End of Q1 2021 -> freeze
- Check what's available
- Merge in anything that's been approved
- Q2 2021 Release -> 3.10
- …
- Unscheduled Releases -> e.g. bug fix -> 3.x.x

The release management workgroup can be found on Slack in #release-management channel. For questions regarding the release process please join the channel and reach out. We're happy to help.

Long-Term Support Release

For the current Long-Term Support (LTS) release overview see here. *Long-term support* means that this version will continue to receive security and other critical updates in alignment with the corresponding Django LTS release.

Any updates it does receive will be backward-compatible and will not alter functional behaviour. This means that users can deploy this version confident that keeping it up-to-date requires only easily-applied security and other critical updates, until the next LTS release.

Branches

We maintain a number of branches on our GitHub repository:

`develop-4`
The default target branch for on-going development and new pull requests.

`release/x.y.z` are the latest released versions of django CMS. Commits
are cherry-picked from `develop-4` and merged into `release/x.y.z` when suitable. We **officially support** the latest, highest released version and the latest LTS.

Please always open PR's against `develop-4` and indicate that they should be backported to the latest LTS release when necessary. Older branches are not supported any longer.

Commits

Commit messages

We follow the Conventional Commits specification for commit messages. Pull requests are linted against this specification so please make your PR title match the specification.

Commit messages and their subject lines should be written in the past tense, not present tense, for example:

> Updated contribution policies.
>
> - Updated branch policy to clarify purpose of develop/release branches
> - Added commit policy.
> - Added changelog policy.

Keep lines short, and within 72 characters as far as possible.

Squashing commits

In order to make our Git history more useful, and to make life easier for the core developers, please rebase and squash your commit history into a single commit representing a single coherent piece of work.

For example, we don't really need or want a commit history, for what ought to be a single commit, that looks like (newest last):

```
2dceb83 Updated contribution policies.
ffe5f2c Fixed spelling mistake in contribution policies.
29168da Fixed typo.
85d925c Updated commit policy based on feedback.
```

The bottom three commits are just noise. They don't represent development of the code base. The four commits should be squashed into a single, meaningful, commit:

```
85d925c Updated contribution policies.
```

How to squash commits

In this example above, you'd use `git rebase -i HEAD~4` (the `4` refers to the number of commits being squashed - adjust it as required).

This will open a `git-rebase-todo` file (showing commits with the newest last):

```
pick 2dceb83 Updated contribution policies.
pick ffe5f2c Fixed spelling mistake in contribution policies.
pick 29168da Fixed typo.
pick 85d925c Updated commit policy based on feedback.
```

"Fixup" the last three commits, using `f` so that they are squashed into the first, and their commit messages discarded:

```
pick 2dceb83 Updated contribution policies.
f ffe5f2c Fixed spelling mistake in contribution policies.
f 29168da Fixed typo.
f 85d925c Updated commit policy based on feedback.
```

Save - and this will leave you with a single commit containing all of the changes:

```
85d925c Updated contribution policies.
```

Ask for help if you run into trouble!

Changelog

Every new feature, bugfix or other change of substance must be represented in the CHANGELOG. This includes documentation, but **doesn't** extend to things like reformatting code, tidying-up, correcting typos and so on.

Each line in the changelog should begin with a verb in the past tense, for example:

```
* Added CMS_WIZARD_CONTENT_PLACEHOLDER setting
* Renamed the CMS_WIZARD_* settings to CMS_PAGE_WIZARD_*
* Deprecated the old-style wizard-related settings
* Improved handling of uninstalled apphooks
* Fixed an issue which could lead to an apphook without a slug
* Updated contribution policies documentation
```

New lines should be added to the top of the list.

Guidelines for django CMS projects

Note: These guidelines are based on the best practice established by the Jazzband project, a community of contributors that shares the responsibility of maintaining Python-based projects.

The django CMS ecosystem consists of many custom projects. Often these projects are maintained by the author themselves. However, sometimes it can make sense to put a project in the care of the django CMS project. Either because it is of interest to the entire community, or because the author can no longer devote time to maintain the project themselves.

Whether an existing project is transferred to the django CMS Github organization, or a new project is set up within the django CMS Github organization, it is important that certain standards are followed.

Acceptance criteria for new projects or existing ones

Projects must meet the criteria of viability, documentation, testing, code of conducts and contributing guidelines. But before that, they must be approved by the Tech Committee.

Approval by Tech Committee of the django CMS Association

New projects or project transfers under the django CMS patronage must first be approved by the Tech Committee. For that you should join the #tech-committee channel on Slack and simply submit your proposal. Then, the TC decides whether or not your project is in line with the product roadmap and overall vision for django CMS.

Viability

Projects to be maintained by the django CMS project must have a certain maturity (No proof of concepts, one-off toys or code snippet hosts) and provide useful functionality. They should also be transferred to django CMS with the agreement of the previous maintainer and in consultation with the Tech Committee (see Tech Committee).

Documentation

Project documentation is one of the most important aspects of a project. For this reason, it is of utmost importance that the project includes prose documentation for end users and contributors. It is also strongly recommended to prepare inline code documentation, as this is considered an indicator of high quality code. Please document as much as possible, but also as clearly and concisely as possible. To quote Jazzband "Write like you're addressing yourself in a few years." More information about how to contribute software documentation can be found here.

Tests

Your contributions and fixes are more than welcome as are your tests. We do not want to compromise our codebase. Therefore, you are going to have to include tests if you want to contribute. For more information about running and writing tests please see here.

Conduct

Projects are required to adopt and follow the django CMS code of conduct. Please see the Contributor Code of Conduct for more information about what that entails and how to report conduct violations.

Contributing Guidelines

Projects have to add a CONTRIBUTING.md (Markdown) or CONTRIBUTING.rst (reStructuredText) file to their repository so it's automatically displayed when new issues and pull requests are created.

The respective file needs to contain this text:

First of all, thank you for wanting to contribute to the django CMS. We always welcome contributions, like many other open-source projects. We are very thankful to the many present, past and future contributors, to our community heroes and to the [members of the django CMS Association. This is a django CMS project. By contributing you agree to abide by the Contributor Code of Conduct and follow the guidelines. Of course extending the contributing document with your project's contributing guide is highly encouraged, too. See GitHub's documentation on contributing guidelines for more information.

Move an existing project to the django CMS Github organization

To initiate the transfer to django CMS, you should use Github's Transfer Feature to transfer the repository to the django CMS organization.

Code and project management

We use our GitHub project for managing both django CMS code and development activity.

This document describes how we manage tickets on GitHub. By "tickets", we mean GitHub issues and pull requests (in fact as far as GitHub is concerned, pull requests are simply a species of issue).

Issues

Raising an issue

> **Attention:** If you think you have discovered a security issue in our code, please report it **privately**, by emailing us at security@django-cms.org.
>
> Please **do not** raise it in any public forum until we have had a chance to deal with it.

Except in the case of security matters, of course, you're welcome to raise issues in any way that suits you - the Slack group <development-community>` or in person if you happen to meet another django CMS developer.

It's very helpful though if you don't just raise an issue by mentioning it to people, but actually file it too, and that means creating a new issue on GitHub.

There's an art to creating a good issue report.

The *Title* needs to be both succinct and informative. "show_sub_menu displays incorrect nodes when used with soft_root" is helpful, whereas "Menus are broken" is not.

In the *Description* of your report, we'd like to see:

- how to reproduce the problem
- what you expected to happen
- what did happen (a traceback is often helpful, if you get one)

Getting your issue accepted

Other django CMS developers will see your issue, and will be able to comment. A core developer may add further comments, or a *label*.

The important thing at this stage is to have your issue *accepted*. This means that we've agreed it's a genuine issue, and represents something we can or are willing to do in the CMS.

You may be asked for more information before it's accepted, and there may be some discussion before it is. It could also be rejected as a *non-issue* (it's not actually a problem) or *won't fix* (addressing your issue is beyond the scope of the project, or is incompatible with our other aims).

Feel free to explain why you think a decision to reject your issue is incorrect - very few decisions are final, and we're always happy to correct our mistakes.

How we process tickets

Tickets should be:

- given a *status*
- marked with *needs*
- marked with a kind
- marked with the components they apply to
- marked with *miscellaneous other labels*
- commented

A ticket's *status* and *needs* are the most important of these. They tell us two key things:

- *status*: what stage the ticket is at
- *needs*: what next actions are required to move it forward

Needless to say, these labels need to be applied carefully, according to the rules of this system.

GitHub's interface means that we have no alternative but to use colours to help identify our tickets. We're sorry about this. We've tried to use colours that will cause the fewest issues for colour-blind people, so we don't use green (since we use red) or yellow (since we use blue) labels, but we are aware it's not ideal.

django CMS ticket processing system rules

- one and only one status **must** be applied to each ticket
- a healthy ticket (blue) **cannot** have any *critical needs* (red)
- when closed, tickets **must** have either a healthy (blue) or dead (black) status
- a ticket with *critical needs* **must not** have *non-critical needs* or *miscellaneous other* labels
- *has patch* and *on hold* labels imply a related pull request, which **must** be linked-to when these labels are applied

- *component*, *non-critical need* and *miscellaneous other* labels should be applied as seems appropriate

Status

The first thing we do is decide whether we accept the ticket, whether it's a pull request or an issue. An accepted status means the ticket is healthy, and will have a blue label.

Basically, it's good for open tickets to be healthy (blue), because that means they are going somewhere.

Important: Accepting a ticket means marking it as healthy, with one of the blue labels.

issues
The bar for *status: accepted* is high. The status can be revoked at any time, and should be when appropriate. If the issue needs a *design decision*, *expert opinion* or *more info*, it can't be *accepted*.

pull requests
When a pull request is accepted, it should become *work in progress* or (more rarely) *ready for review* or even *ready to be merged*, in those rare cases where a perfectly-formed and unimprovable pull request lands in our laps. As for issues, if it needs a *design decision*, *expert opinion* or *more info*, it can't be accepted.

No issue or pull request can have both a blue (accepted) and a red, grey or black label at the same time.

Preferably, the ticket should either be accepted (blue), rejected (black) or marked as having critical needs (red) *as soon as possible*. It's important that open tickets should have a clear status, not least for the sake of the person who submitted it so that they know it's being assessed.

Tickets should not be allowed to linger indefinitely with critical (red) needs. If the opinions or information required to accept the ticket are not forthcoming, the ticket should be declared unhealthy (grey) with *marked for rejection* and rejected (black) at the next release.

Needs

Critical needs (red) affect status.

Non-critical needs labels (pink) can be added as appropriate (and of course, removed as work progresses) to pull requests.

It's important that open tickets should have a clear needs labels, so that it's apparent what needs to be done to make progress with it.

Kinds and components

Of necessity, these are somewhat porous categories. For example, it's not always absolutely clear whether a pull request represents an enhancement or a bug-fix, and tickets can apply to multiple parts of the CMS - so do the best you can with them.

Other labels

backport, *blocker*, *has patch* or *easy pickings* labels should be applied as appropriate, to healthy (blue) tickets only.

Comments

At any time, people can comment on the ticket, of course. Although only core maintainers can change labels, anyone can suggest changing a label.

Label reference

Components and *kinds* should be self-explanatory, but *statuses*, *needs* and *miscellaneous other labels* are clarified below.

Statuses

A ticket's *status* is its position in the pipeline - its point in our workflow.

Every issue should have a status, and be given one as soon as possible. **An issue should have only one status applied to it**.

Many of these statuses apply equally well to both issues and pull requests, but some make sense only for one or the other:

accepted
: (issues only) The issue has been accepted as a genuine issue that needs to be addressed. Note that it doesn't necessarily mean we will do what the issue suggests, if it makes a suggestion - simply that we agree that there is an issue to be resolved.

non-issue
: The issue or pull request are in some way mistaken - the 'problem' is in fact correct and expected behaviour, or the problems were caused by (for example) misconfiguration.

  When this label is applied, an explanation must be provided in a comment.

won't fix
: The issue or pull request imply changes to django CMS's design or behaviour that the core team consider incompatible with our chosen approach.

  When this label is applied, an explanation must be provided in a comment.

marked for rejection
: We've been unable to reproduce the issue, and it has lain dormant for a long time. Or, it's a pull request of low significance that requires more work, and looks like it might have been abandoned. These tickets will be closed when we make the next release.

  When this label is applied, an explanation must be provided in a comment.

work in progress
: (pull requests only) Work is on-going.

  The author of the pull request should include "(work in progress)" in its title, and remove this when they feel it's ready for final review.

ready for review
: (pull requests only) The pull request needs to be reviewed. (Anyone can review and make comments recommending that it be merged (or indeed, any further action) but only a core maintainer can change the label.)

ready to be merged
(pull requests only) The pull request has successfully passed review. Core maintainers should not mark their own code, except in the simplest of cases, as *ready to be merged*, nor should they mark any code as *ready to be merged* and then merge it themselves - there should be another person involved in the process.

When the pull request is merged, the label should be removed.

Needs

If an issue or pull request lacks something that needs to be provided for it to progress further, this should be marked with a "needs" label. A "needs" label indicates an *action* that should be taken in order to advance the item's status.

Critical needs

Critical needs (red) mean that a ticket is 'unhealthy' and won't be *accepted* (issues) or *work in progress*, *ready for review* or *ready to be merged* until those needs are addressed. In other words, no ticket can have both a blue and a red label.)

more info
Not enough information has been provided to allow us to proceed, for example to reproduce a bug or to explain the purpose of a pull request.

expert opinion
The issue or pull request presents a technical problem that needs to be looked at by a member of the core maintenance team who has a special insight into that particular aspect of the system.

design decision
The issue or pull request has deeper implications for the CMS, that need to be considered carefully before we can proceed further.

Non-critical needs

A healthy (blue) ticket can have non-critical needs:

patch
(issues only) The issue has been given a *status: accepted*, but now someone needs to write the patch to address it.

tests
docs
(pull requests only) Code without docs or tests?! In django CMS? No way!

Other

has patch
(issues only) A patch intended to address the issue exists. This doesn't imply that the patch will be accepted, or even that it contains a viable solution.

When this label is applied, a comment should cross-reference the pull request(s) containing the patch.

easy pickings
An easy-to-fix issue, or an easy-to-review pull request - newcomers to django CMS development are encouraged to tackle *easy pickings* tickets.

blocker
We can't make the next release without resolving this issue.

backport
Any patch will should be backported to a previous release, either because it has security implications or it improves documentation.

on hold
(pull requests only) The pull request has to wait for a higher-priority pull request to land first, to avoid complex merges or extra work later. Any *on hold* pull request is by definition *work in progress*.

When this label is applied, a comment should cross-reference the other pull request(s).

Running and writing tests

Good code needs tests.

A project like django CMS simply can't afford to incorporate new code that doesn't come with its own tests.

Tests provide some necessary minimum confidence: they can show the code will behave as it expected, and help identify what's going wrong if something breaks it.

Not insisting on good tests when code is committed is like letting a gang of teenagers without a driving license borrow your car on a Friday night, even if you think they are very nice teenagers and they really promise to be careful.

We certainly do want your contributions and fixes, but we need your tests with them too. Otherwise, we'd be compromising our codebase.

So, you are going to have to include tests if you want to contribute. However, writing tests is not particularly difficult, and there are plenty of examples to crib from in the code to help you.

Running tests

There's more than one way to do this, but here's one to help you get started:

```
# create a virtual environment
virtualenv test-django-cms

# activate it
cd test-django-cms/
source bin/activate

# get django CMS from GitHub
git clone https://github.com/django-cms/django-cms.git

# install the dependencies for testing
# note that requirements files for other Django versions are also provided
pip install -r django-cms/test_requirements/django-X.Y.txt

# run the test suite
# note that you must be in the django-cms directory when you do this,
# otherwise you'll get "Template not found" errors
cd django-cms
python manage.py test
```

It can take a few minutes to run.

When you run tests against your own new code, don't forget that it's useful to repeat them for different versions of Python and Django.

Problems running the tests

We are working to improve the performance and reliability of our test suite. We're aware of certain problems, but need feedback from people using a wide range of systems and configurations in order to benefit from their experience.

Please report any issues on our GitHub repository.

If you can help *improve* the test suite, your input will be especially valuable.

OS X users

In some versions of OS X, `gettext` needs to be installed so that it is available to Django. If you run the tests and find that various tests in `cms.tests.frontend` raise errors, it's likely that you have this problem.

A solution is:

```
brew install gettext && brew link --force gettext
```

(This requires the installation of Homebrew)

ERROR: test_copy_to_from_clipboard (cms.tests.frontend.PlaceholderBasicTests)

You may find that a single frontend test raises an error. This sometimes happens, for some users, when the entire suite is run. To work around this you can invoke the test class on its own:

```
manage.py test cms.PlaceholderBasicTests
```

and it should then run without errors.

ERROR: zlib is required unless explicitly disabled using --disable-zlib, aborting

If you run into that issue, make sure to install zlib using Homebrew:

```
brew install libjpeg zlib && brew link --force zlib
```

Advanced testing options

Run `manage.py test --help` for the full list of advanced options.

Use `--parallel` to distribute the test cases across your CPU cores.

Use `--failed` to only run the tests that failed during the last run.

Use `--retest` to run the tests using the same configuration as the last run.

Use `--vanilla` to bypass the advanced testing system and use the built-in Django test command.

To use a different database, set the `DATABASE_URL` environment variable to a dj-database-url compatible value.

Running Frontend Tests

We have two types of frontend tests: unit tests and integration tests. For unit tests we are using Karma as a test runner and Jasmine as a test framework.

In order to be able to run them you need to install necessary dependencies as outlined in *frontend tooling installation instructions*.

Linting runs against the test files as well with `gulp lint`. In order to run linting continuously, do:

```
gulp watch
```

Unit tests

Unit tests can be run like this:

```
gulp unitTest
```

If your code is failing and you want to run only specific files, you can provide the `--tests` parameter with comma separated file names, like this:

```
gulp unitTest --tests=cms.base,cms.modal
```

If you want to run tests continuously you can use the watch command:

```
gulp unitTest --watch
```

This will rerun the suite whenever source or test file is changed. By default the tests are running on PhantomJS, but when running Karma in watch mode you can also visit the server it spawns with an actual browser.

> INFO [karma]: Karma v0.13.15 server started at http://localhost:9876/

On Travis CI we are using SauceLabs integration to run tests in a set of different real browsers, but you can opt out of running them on saucelabs using `[skip saucelabs]` marker in the commit message, similar to how you would skip the build entirely using `[skip ci]`.

We're using Jasmine as a test framework and Istanbul as a code coverage tool.

Writing tests

Contributing tests is widely regarded as a very prestigious contribution (you're making everybody's future work much easier by doing so). We'll always accept contributions of a test without code, but not code without a test - which should give you an idea of how important tests are.

What we need

We have a wide and comprehensive library of unit-tests and integration tests with good coverage.

Generally tests should be:

- Unitary (as much as possible). i.e. should test as much as possible only one function/method/class. That's the very definition of unit tests. Integration tests are interesting too obviously, but require more time to maintain since they have a higher probability of breaking.

- Short running. No hard numbers here, but if your one test doubles the time it takes for everybody to run them, it's probably an indication that you're doing it wrong.
- Easy to understand. If your test code isn't obvious, please add comments on what it's doing.

Code of Conduct

Participation in the django CMS project is governed by a code of conduct.

The django CMS community is a pleasant one to be involved in for everyone, and we wish to keep it that way. Participants are expected to behave and communicate with others courteously and respectfully, whether online or in person, and to be welcoming, friendly and polite.

We will not tolerate abusive behaviour or language or any form of harassment.

Individuals whose behaviour is a cause for concern will be given a warning, and if necessary will be excluded from participation in official django CMS channels (Slack group, email lists, etc) and events. The Django Software Foundation will also be informed of the issue.

Raising a concern

If you have a concern about the behaviour of any member of the django CMS community, please contact us via info@django-cms.org and our Community Manager will reach out to you.

Your concerns will be taken seriously, treated as confidential and investigated. You will be informed, in writing and as promptly as possible, of the outcome.

5.2.7 Who is behind django CMS

django CMS was released under a BSD licence in 2009. It was created at Divio AG of Zürich, Switzerland, by Patrick Lauber, who led its development for several years.

the django CMS Association

In July 2020 Divio handed over the banner to the newly founded django CMS Association (dCA). Its goal is to drive the success of django CMS, by increasing customer happiness, market share and open-source-contributions. Divio remains thoroughly committed to django CMS as the host of the django CMS project website and as one of the founding members of the dCA, next to What. and Eliga Services.

The dCA's role in steering the project's development is formalised in the django CMS technical committee, whose members are drawn from the django CMS community and the dCA.

The dCA maintains overall control of the django CMS repository. As the chief backer of django CMS, and in order to ensure a consistent and long-term approach to the project, the dCA reserves the right of final say in any decisions concerning its development.

As a non-profit organization the django CMS Association is dependent on donations to fulfill its mission, which is based on the following three statements:

- Innovate and lead
- Foster contribution
- Drive adoption

The best way to donate is to become a member of the association and pay membership fees. The funding is funneled back into core development and community projects.

- Sign up for more information about becoming a member of the dCA

The dCA Tech Committee

Mission

It prepares and updates the technical roadmap for approval by the Executive Board and/or the General Assembly, manages incoming feature requests and proposals and takes decisions on awarding credits for work submitted by members.

- Find out more about the mission

Team

- Overview of the team

Tasks

- Tasks & Decisions Log
- Kanban Board

Processes

- Become a core contributor
- Become a member of the Tech Committee

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