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# **Wagtail Documentation**

***Release 1.7***

**Torchbox**

February 16, 2017



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Wagtail is an open source CMS written in [Python](#) and built on the Django web framework.

Below are some useful links to help you get started with Wagtail.

- **First steps**

- [Getting started](#)
- [Your first Wagtail site](#)
- [Demo site](#)

- **Using Wagtail**

- [Page models](#)
- [Writing templates](#)
- [Using images in templates](#)
- [Search](#)
- [Third-party tutorials](#)

- **For editors**

- [Editors guide](#)



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## Index

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## Getting started

Wagtail is built on the [Django web framework](#), so this document assumes you've already got the essentials installed. But if not, those essentials are:

- [Python](#)
- [pip](#) (Note that pip is included by default with Python 2.7.9 and later and Python 3.4 and later)

We'd also recommend [Virtualenv](#), which provides isolated Python environments:

- [Virtualenv](#)

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**Important:** Before installing Wagtail, it is necessary to install the **libjpeg** and **zlib** libraries, which provide support for working with JPEG, PNG and GIF images (via the Python **Pillow** library). The way to do this varies by platform - see Pillow's [platform-specific installation instructions](#).

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With the above installed, the quickest way to install Wagtail is:

```
pip install wagtail
```

(`sudo` may be required if installing system-wide or without virtualenv)

Once installed, Wagtail provides a command similar to Django's `django-admin startproject` which stubs out a new site/project:

```
wagtail start mysite
```

This will create a new folder `mysite`, based on a template containing all you need to get started. More information on that template is available [here](#).

Inside your `mysite` folder, we now just run the setup steps necessary for any Django project:

```
pip install -r requirements.txt
./manage.py migrate
./manage.py createsuperuser
./manage.py runserver
```

Your site is now accessible at `http://localhost:8000`, with the admin backend available at `http://localhost:8000/admin/`.

This will set you up with a new standalone Wagtail project. If you'd like to add Wagtail to an existing Django project instead, see [Integrating Wagtail into a Django project](#).

There are a few optional packages which are not installed by default but are recommended to improve performance or add features to Wagtail, including:

- Elasticsearch.
- *Feature Detection*.

## Your first Wagtail site

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**Note:** This tutorial covers setting up a brand new Wagtail project. If you'd like to add Wagtail to an existing Django project instead, see [Integrating Wagtail into a Django project](#).

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1. Install Wagtail and its dependencies:

```
pip install wagtail
```

2. Start your site:

```
wagtail start mysite  
cd mysite
```

Wagtail provides a `start` command similar to `django-admin.py startproject`. Running `wagtail start mysite` in your project will generate a new `mysite` folder with a few Wagtail-specific extras, including the required project settings, a “home” app with a blank `HomePage` model and basic templates and a sample “search” app.

3. Install project dependencies:

```
pip install -r requirements.txt
```

This ensures that you have the relevant version of Django for the project you've just created.

4. Create the database:

```
python manage.py migrate
```

If you haven't updated the project settings, this will be a SQLite database file in the project directory.

5. Create an admin user:

```
python manage.py createsuperuser
```

6. `python manage.py runserver` If everything worked, <http://127.0.0.1:8000> will show you a welcome page

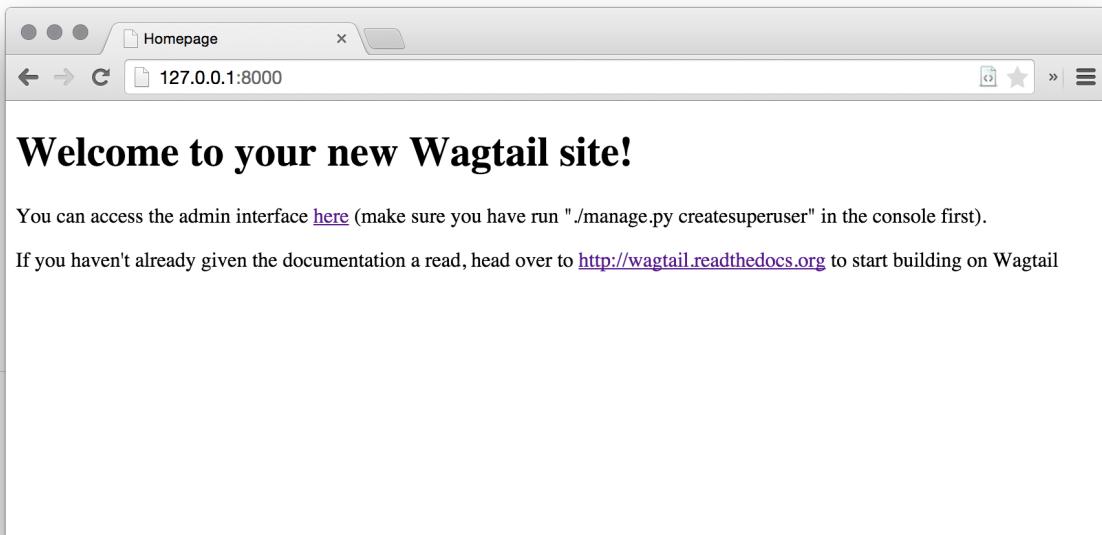
You can now access the administrative area at <http://127.0.0.1:8000/admin>

## Extend the HomePage model

Out of the box, the “home” app defines a blank `HomePage` model in `models.py`, along with a migration that creates a homepage and configures Wagtail to use it.

Edit `home/models.py` as follows, to add a `body` field to the model:

```
from __future__ import unicode_literals  
  
from django.db import models
```



```
from wagtail.wagtailcore.models import Page
from wagtail.wagtailcore.fields import RichTextField
from wagtail.wagtailadmin.edit_handlers import FieldPanel

class HomePage(Page):
    body = RichTextField(blank=True)

    content_panels = Page.content_panels + [
        FieldPanel('body', classname="full")
    ]
```

body is defined as RichTextField, a special Wagtail field. You can use any of the Django core fields. content\_panels define the capabilities and the layout of the editing interface. [More on creating Page models](#).

Run `python manage.py makemigrations`, then `python manage.py migrate` to update the database with your model changes. You must run the above commands each time you make changes to the model definition.

You can now edit the homepage within the Wagtail admin area (go to Explorer, Homepage, then Edit) to see the new body field. Enter some text into the body field, and publish the page.

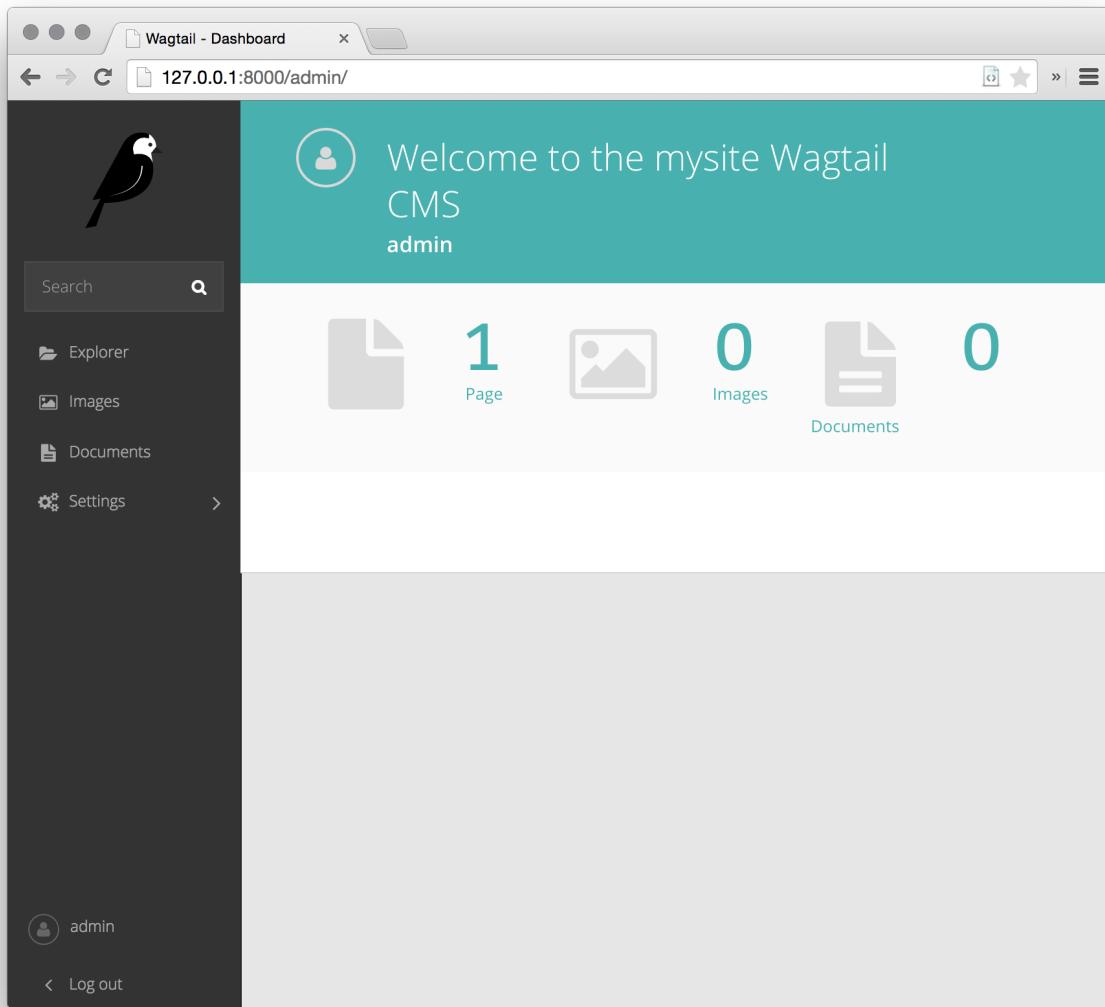
The page template now needs to be updated to reflect the changes made to the model. Wagtail uses normal Django templates to render each page type. It automatically generates a template filename from the model name by separating capital letters with underscores (e.g. HomePage becomes home\_page.html). Edit `home/templates/home/home_page.html` to contain the following:

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

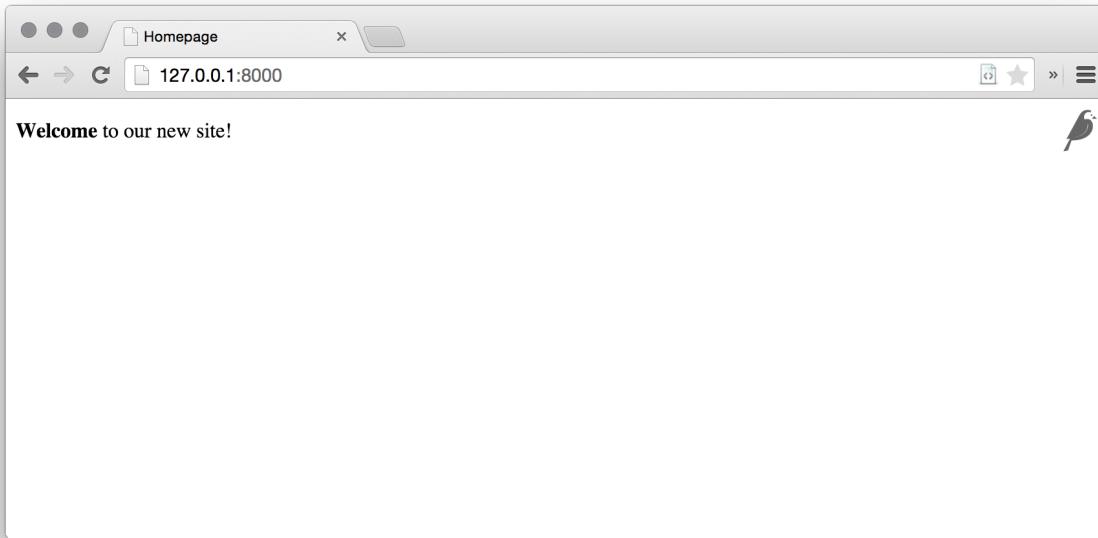
{% load wagtailcore_tags %}

{% block body_class %}template-homepage{% endblock %}

{% block content %}
  {{ page.body|richtext }}
```



```
{% endblock %}
```



## Wagtail template tags

Wagtail provides a number of *template tags* & *filters* which can be loaded by including `{% load wagtailcore_tags %}` at the top of your template file.

In this tutorial, we use the `richtext` filter to escape and print the contents of a `RichTextField`:

```
{% load wagtailcore_tags %}
{{ page.body|richtext }}
```

Produces:

```
<div class="rich-text">
  <p>
    <b>Welcome</b> to our new site!
  </p>
</div>
```

**Note:** You'll need to include `{% load wagtailcore_tags %}` in each template that uses Wagtail's tags. Django will throw a `TemplateSyntaxError` if the tags aren't loaded.

## A basic blog

We are now ready to create a blog. To do so, run `python manage.py startapp blog` to create a new app in your Wagtail site.

Add the new `blog` app to `INSTALLED_APPS` in `mysite/settings/base.py`.

The following example defines a basic blog post model in `blog/models.py`:

```
from django.db import models

from wagtail.wagtailcore.models import Page
from wagtail.wagtailcore.fields import RichTextField
from wagtail.wagtailadmin.edit_handlers import FieldPanel
from wagtail.wagtailsearch import index

class BlogPage(Page):
    date = models.DateField("Post date")
    intro = models.CharField(max_length=250)
    body = RichTextField(blank=True)

    search_fields = Page.search_fields + [
        index.SearchField('intro'),
        index.SearchField('body'),
    ]

    content_panels = Page.content_panels + [
        FieldPanel('date'),
        FieldPanel('intro'),
        FieldPanel('body', classname="full")
    ]
```

---

**Note:** On Wagtail versions before 1.5, `search_fields` needs to be defined as a tuple:

```
search_fields = Page.search_fields + (
    index.SearchField('intro'),
    index.SearchField('body'),
)
```

---

Create a template at `blog/templates/blog/blog_page.html`:

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

{% load wagtailcore_tags %}

{% block body_class %}template-blogpage{% endblock %}

{% block content %}
    <h1>{{ page.title }}</h1>
    <p class="meta">{{ page.date }}</p>

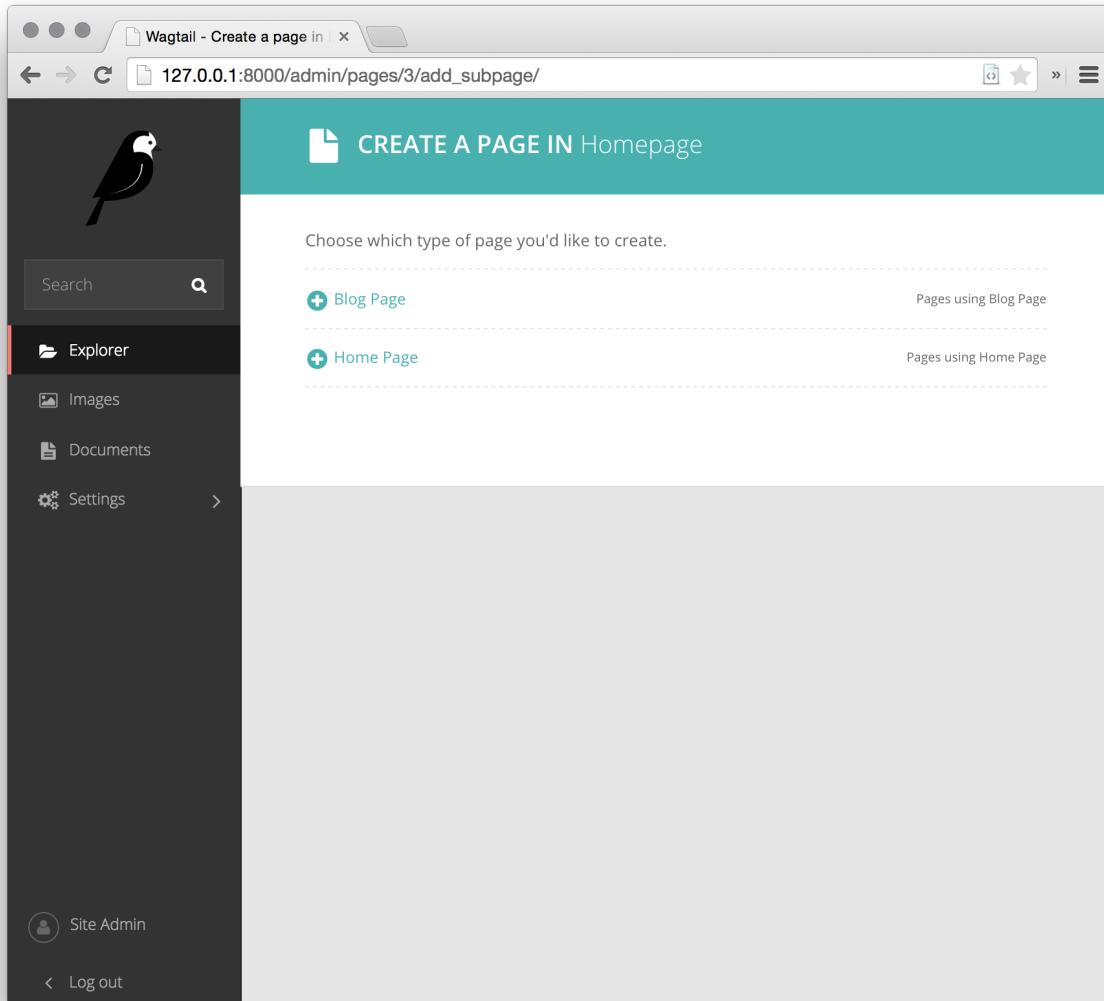
    <div class="intro">{{ page.intro }}</div>

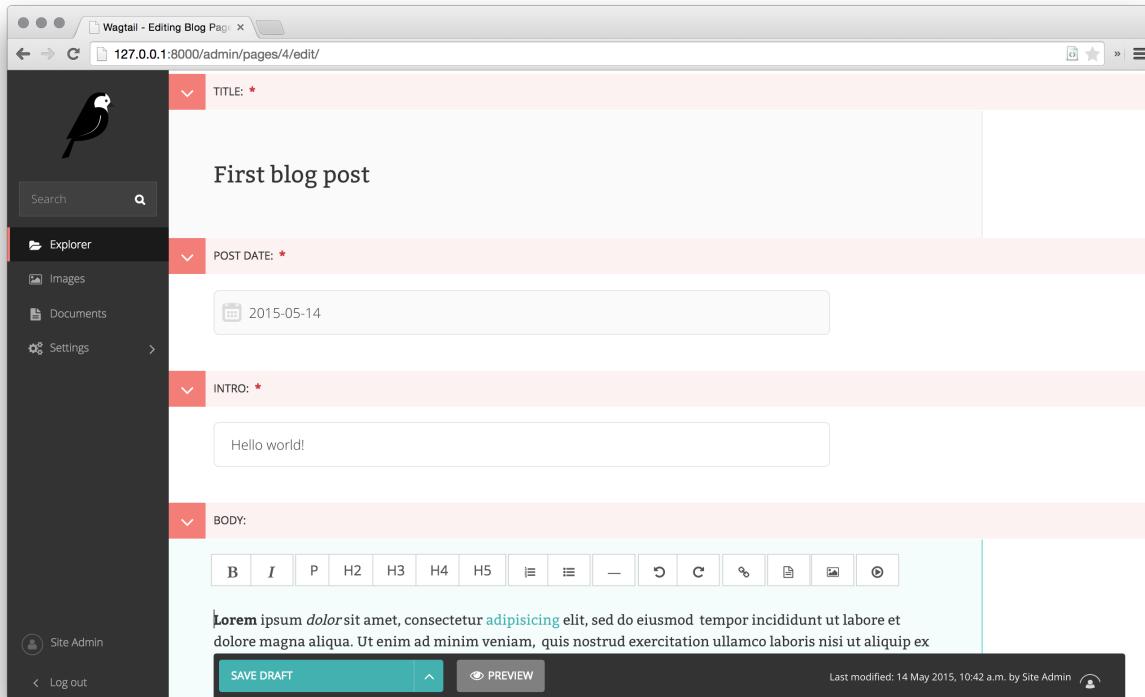
    {{ page.body|richtext }}
{% endblock %}
```

Run `python manage.py makemigrations` and `python manage.py migrate`.

### Image support

Wagtail provides support for images out of the box. To add them to your model:





```
from django.db import models

from wagtail.wagtailcore.models import Page
from wagtail.wagtailcore.fields import RichTextField
from wagtail.wagtailadmin.edit_handlers import FieldPanel
from wagtail.wagtailimages.edit_handlers import ImageChooserPanel
from wagtail.wagtailsearch import index


class BlogPage(Page):
    main_image = models.ForeignKey(
        'wagtailimages.Image',
        null=True,
        blank=True,
        on_delete=models.SET_NULL,
        related_name='+'
    )
    date = models.DateField("Post date")
    intro = models.CharField(max_length=250)
    body = RichTextField(blank=True)

    search_fields = Page.search_fields + [
        index.SearchField('intro'),
        index.SearchField('body'),
    ]

    content_panels = Page.content_panels + [
        FieldPanel('date'),
        ImageChooserPanel('main_image'),
```

```
        FieldPanel('intro'),
        FieldPanel('body'),
    ]
```

Run `python manage.py makemigrations` and `python manage.py migrate`.

Adjust your blog page template to include the image:

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

{% load wagtailcore_tags wagtailimages_tags %}

{% block body_class %}template-blogpage{% endblock %}

{% block content %}
<h1>{{ page.title }}</h1>
<p class="meta">{{ page.date }}</p>

{% if page.main_image %}
    {% image page.main_image width-400 %}
{% endif %}

<div class="intro">{{ page.intro }}</div>

{{ page.body|richtext }}
{% endblock %}
```

You can read more about using images in templates in the [docs](#).

## Blog Index

Let us extend the Blog app to provide an index.

```
class BlogIndexPage(Page):
    intro = RichTextField(blank=True)

    content_panels = Page.content_panels + [
        FieldPanel('intro', classname="full")
    ]
```

The above creates an index type to collect all our blog posts.

`blog/templates/blog/blog_index_page.html`

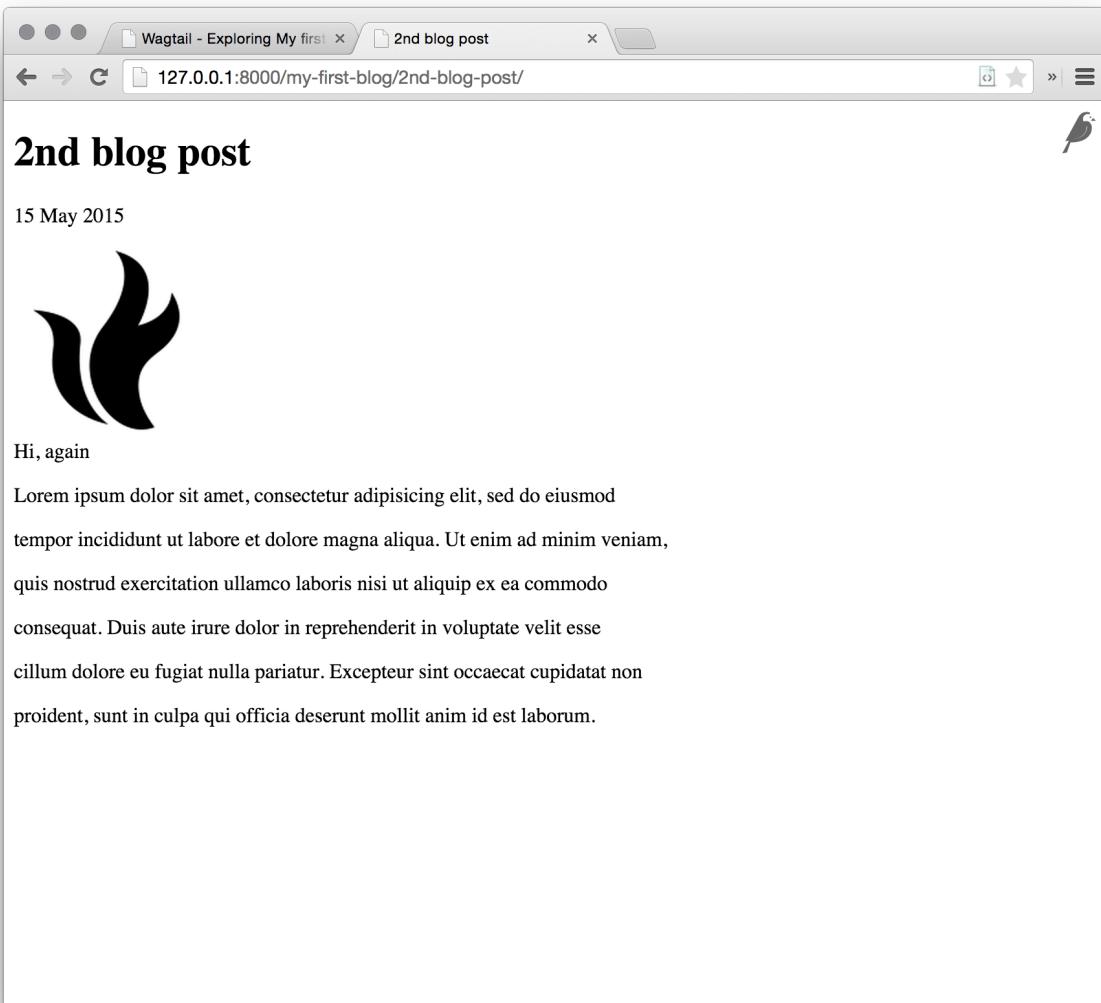
```
{% extends "base.html" %}

{% load wagtailcore_tags %}

{% block body_class %}template-blogindexpage{% endblock %}

{% block content %}
<h1>{{ page.title }}</h1>

<div class="intro">{{ page.intro|richtext }}</div>
{% endblock %}
```



## Related items

Let's extend the `BlogIndexPage` to add related links. The related links can be `BlogPages` or external links. Change `blog/models.py` to

```
from django.db import models

from modelcluster.fields import ParentalKey

from wagtail.wagtailcore.models import Page, Orderable
from wagtail.wagtailcore.fields import RichTextField
from wagtail.wagtailadmin.edit_handlers import (FieldPanel,
                                                InlinePanel,
                                                MultiFieldPanel,
                                                PageChooserPanel)
from wagtail.wagtailimages.edit_handlers import ImageChooserPanel
from wagtail.wagtailsearch import index

# ...

class LinkFields(models.Model):
    link_external = models.URLField("External link", blank=True)
    link_page = models.ForeignKey(
        'wagtailcore.Page',
        null=True,
        blank=True,
        related_name='+'
    )

    @property
    def link(self):
        if self.link_page:
            return self.link_page.url
        else:
            return self.link_external

    panels = [
        FieldPanel('link_external'),
        PageChooserPanel('link_page'),
    ]

    class Meta:
        abstract = True

# Related links
class RelatedLink(LinkFields):
    title = models.CharField(max_length=255, help_text="Link title")

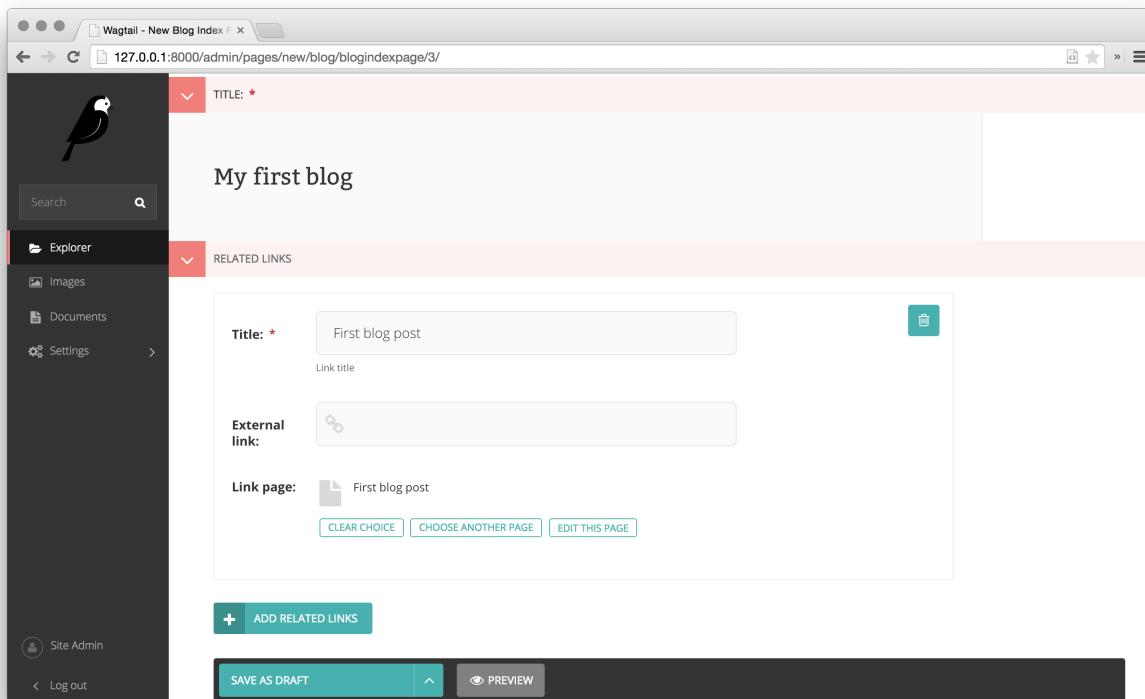
    panels = [
        FieldPanel('title'),
        MultiFieldPanel(LinkFields.panels, "Link"),
    ]

    class Meta:
        abstract = True
```

```
class BlogIndexPage(Page):
    intro = RichTextField(blank=True)

    content_panels = Page.content_panels + [
        FieldPanel('intro', classname="full"),
        InlinePanel('related_links', label="Related links"),
    ]


class BlogIndexRelatedLink(Orderable, RelatedLink):
    page = ParentalKey('BlogIndexPage', related_name='related_links')
```



Extend `blog_index_page.html` to show related items

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

{% load wagtailcore_tags %}

{% block body_class %}template-blogindexpage{% endblock %}

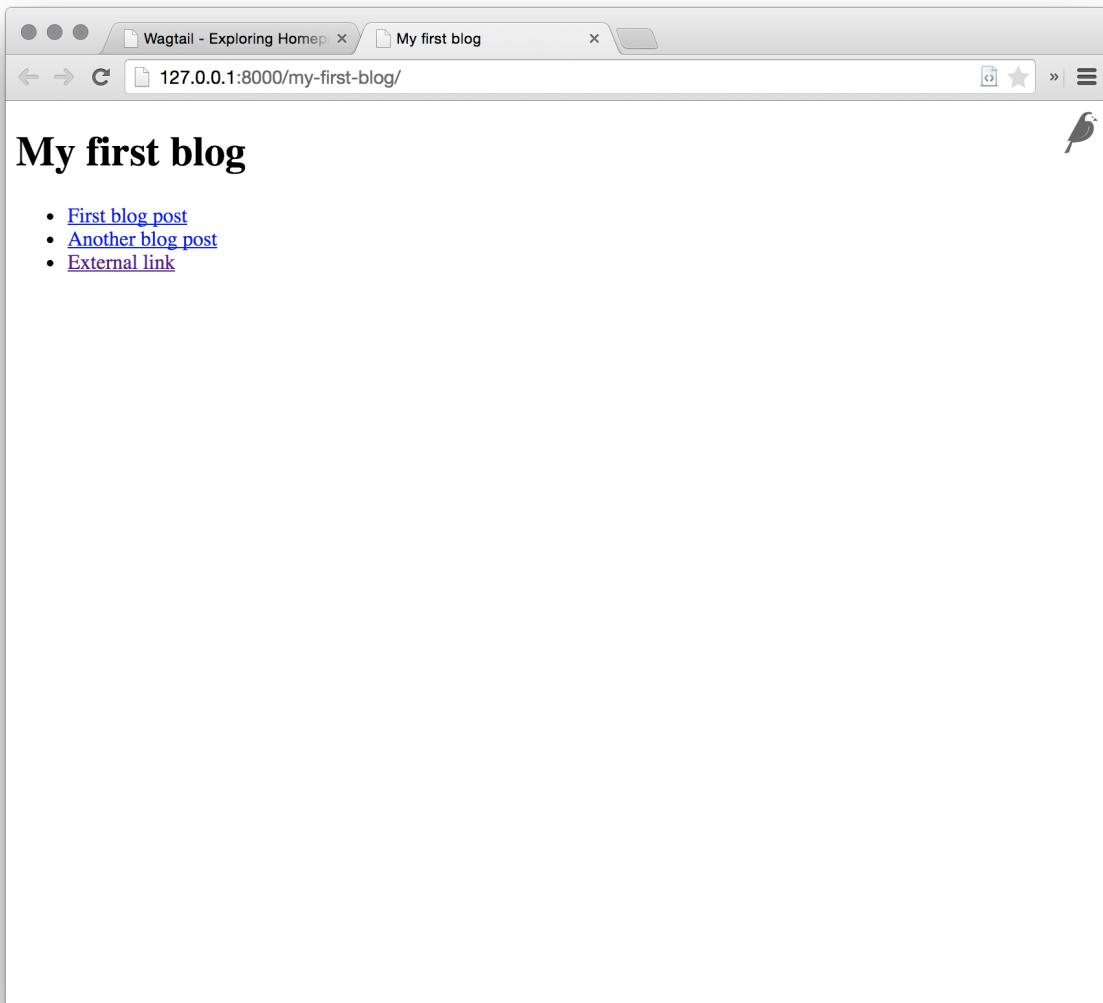
{% block content %}
    <h1>{{ page.title }}</h1>

    <div class="intro">{{ page.intro|richtext }}</div>

    {% if page.related_links.all %}
        <ul>
            {% for item in page.related_links.all %}
                <li><a href="{{ item.link }}">{{ item.title }}</a></li>
            {% endfor %}
        </ul>
    {% endif %}
</div>
```

```
</ul>
{%
  endif
%}
{%
  endblock
%}
```

You now have a fully working blog with featured blog posts.



## Where next

- Read the Wagtail topics and reference documentation
- Learn how to implement StreamField for freeform page content
- Browse through the advanced topics section and read third-party tutorials

## Demo site

To create a new site on Wagtail we recommend the `wagtail start` command in [Getting started](#), however a demo site exists containing example page types and models. We also recommend you use the demo site for testing during development of Wagtail itself.

The repo and installation instructions can be found here: <https://github.com/torchbox/wagtaildemo>

## Integrating Wagtail into a Django project

Wagtail provides the `wagtail start` command and project template to get you started with a new Wagtail project as quickly as possible, but it's easy to integrate Wagtail into an existing Django project too.

Wagtail is currently compatible with Django 1.8, 1.9 and 1.10. First, install the `wagtail` package from PyPI:

```
pip install wagtail
```

or add the package to your existing requirements file. This will also install the **Pillow** library as a dependency, which requires libjpeg and zlib - see Pillow's [platform-specific installation instructions](#).

## Settings

In your settings file, add the following apps to `INSTALLED_APPS`:

```
'wagtail.wagtailforms',
'wagtail.wagtailredirects',
'wagtail.wagtailembeds',
'wagtail.wagtailsites',
'wagtail.wagtailusers',
'wagtail.wagtaillsnippets',
'wagtail.wagtailldocs',
'wagtail.wagtailimages',
'wagtail.wagtailsearch',
'wagtail.wagtailadmin',
'wagtail.wagtailcore',

'modelcluster',
'taggit',
```

Add the following entries to `MIDDLEWARE_CLASSES`:

```
'wagtail.wagtailcore.middleware.SiteMiddleware',
'wagtail.wagtailredirects.middleware.RedirectMiddleware',
```

Add a `STATIC_ROOT` setting, if your project does not have one already:

```
STATIC_ROOT = os.path.join(BASE_DIR, 'static')
```

Add a `WAGTAIL_SITE_NAME` - this will be displayed on the main dashboard of the Wagtail admin backend:

```
WAGTAIL_SITE_NAME = 'My Example Site'
```

Various other settings are available to configure Wagtail's behaviour - see [Configuring Django for Wagtail](#).

## URL configuration

Now make the following additions to your `urls.py` file:

```

from wagtail.wagtailadmin import urls as wagtailadmin_urls
from wagtail.wagtailedocs import urls as wagtailedocs_urls
from wagtail.wagtailcore import urls as wagtail_urls

urlpatterns = [
    ...
    url(r'^cms/', include(wagtailadmin_urls)),
    url(r'^documents/', include(wagtailedocs_urls)),
    url(r'^pages/', include(wagtail_urls)),
    ...
]

```

The URL paths here can be altered as necessary to fit your project's URL scheme.

`wagtailadmin_urls` provides the admin interface for Wagtail. This is separate from the Django admin interface (`django.contrib.admin`); Wagtail-only projects typically host the Wagtail admin at `/admin/`, but if this would clash with your project's existing admin backend then an alternative path can be used, such as `/cms/` here.

`wagtailedocs_urls` is the location from where document files will be served. This can be omitted if you do not intend to use Wagtail's document management features.

`wagtail_urls` is the base location from where the pages of your Wagtail site will be served. In the above example, Wagtail will handle URLs under `/pages/`, leaving the root URL and other paths to be handled as normal by your Django project. If you want Wagtail to handle the entire URL space including the root URL, this can be replaced with:

```
url(r'', include(wagtail_urls)),
```

In this case, this should be placed at the end of the `urlpatterns` list, so that it does not override more specific URL patterns.

Finally, your project needs to be set up to serve user-uploaded files from `MEDIA_ROOT`. Your Django project may already have this in place, but if not, add the following snippet to `urls.py`:

```

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

urlpatterns = [
    # ... the rest of your URLconf goes here ...
] + static(settings.MEDIA_URL, document_root=settings.MEDIA_ROOT)

```

Note that this only works in development mode (`DEBUG = True`); in production, you will need to configure your web server to serve files from `MEDIA_ROOT`. For further details, see the Django documentation: [Serving files uploaded by a user during development](#) and [Deploying static files](#).

With this configuration in place, you are ready to run `./manage.py migrate` to create the database tables used by Wagtail.

## User accounts

Superuser accounts receive automatic access to the Wagtail admin interface; use `./manage.py createsuperuser` if you don't already have one. Custom user models are supported, with some restrictions; Wagtail uses an extension of Django's permissions framework, so your user model must at minimum inherit from `AbstractBaseUser` and `PermissionsMixin`.

## Start developing

You're now ready to add a new app to your Django project (via `./manage.py startapp` - remember to add it to `INSTALLED_APPS`) and set up page models, as described in [Your first Wagtail site](#).

Note that there's one small difference when not using the Wagtail project template: Wagtail creates an initial homepage of the basic type `Page`, which does not include any content fields beyond the title. You'll probably want to replace this with your own `HomePage` class - when you do so, ensure that you set up a site record (under Settings / Sites in the Wagtail admin) to point to the new homepage.

## Usage guide

### Page models

Each page type (a.k.a. content type) in Wagtail is represented by a Django model. All page models must inherit from the `wagtail.wagtailcore.models.Page` class.

As all page types are Django models, you can use any field type that Django provides. See [Model field reference](#) for a complete list of field types you can use. Wagtail also provides `RichTextField` which provides a WYSIWYG editor for editing rich-text content.

#### Django models

If you're not yet familiar with Django models, have a quick look at the following links to get you started:

- [Creating models](#)
- [Model syntax](#)

### An example Wagtail page model

This example represents a typical blog post:

```
from django.db import models

from modelcluster.fields import ParentalKey

from wagtail.wagtailcore.models import Page, Orderable
from wagtail.wagtailcore.fields import RichTextField
from wagtail.wagtailadmin.edit_handlers import FieldPanel, MultiFieldPanel, InlinePanel
from wagtail.wagtailimages.edit_handlers import ImageChooserPanel
from wagtail.wagtailsearch import index


class BlogPage(Page):

    # Database fields

    body = RichTextField()
    date = models.DateField("Post date")
    feed_image = models.ForeignKey(
        'wagtailimages.Image',
        null=True,
        blank=True,
        on_delete=models.SET_NULL,
        related_name='+'
    )

    # Search index configuration
```

```

search_fields = Page.search_fields + [
    index.SearchField('body'),
    index.FilterField('date'),
]

# Editor panels configuration

content_panels = Page.content_panels + [
    FieldPanel('date'),
    FieldPanel('body', classname="full"),
    InlinePanel('related_links', label="Related links"),
]

promote_panels = [
    MultiFieldPanel(Page.promote_panels, "Common page configuration"),
    ImageChooserPanel('feed_image'),
]

# Parent page / subpage type rules

parent_page_types = ['blog.BlogIndex']
subpage_types = []

class BlogPageRelatedLink(Orderable):
    page = ParentalKey(BlogPage, related_name='related_links')
    name = models.CharField(max_length=255)
    url = models.URLField()

    panels = [
        FieldPanel('name'),
        FieldPanel('url'),
    ]

```

---

**Important:** Ensure that none of your field names are the same as your class names. This will cause errors due to the way Django handles relations ([read more](#)). In our examples we have avoided this by appending “Page” to each model name.

---

## Writing page models

Here we’ll describe each section of the above example to help you create your own page models.

### Database fields

Each Wagtail page type is a Django model, represented in the database as a separate table.

Each page type can have its own set of fields. For example, a news article may have body text and a published date, whereas an event page may need separate fields for venue and start/finish times.

In Wagtail, you can use any Django field class. Most field classes provided by [third party apps](#) should work as well.

Wagtail also provides a couple of field classes of its own:

- `RichTextField` - For rich text content
- `StreamField` - A block-based content field (see: [Freeform page content using StreamField](#))

For tagging, Wagtail fully supports [django-taggit](#) so we recommend using that.

### Search

The `search_fields` attribute defines which fields are added to the search index and how they are indexed.

This should be a list of `SearchField` and `FilterField` objects. `SearchField` adds a field for full-text search. `FilterField` adds a field for filtering the results. A field can be indexed with both `SearchField` and `FilterField` at the same time (but only one instance of each).

In the above example, we've indexed `body` for full-text search and `date` for filtering.

The arguments that these field types accept are documented in [Indexing extra fields](#).

### Editor panels

There are a few attributes for defining how the page's fields will be arranged in the page editor interface:

- `content_panels` - For content, such as main body text
- `promote_panels` - For metadata, such as tags, thumbnail image and SEO title
- `settings_panels` - For settings, such as publish date

Each of these attributes is set to a list of `EditHandler` objects, which defines which fields appear on which tabs and how they are structured on each tab.

Here's a summary of the `EditHandler` classes that Wagtail provides out of the box. See [Available panel types](#) for full descriptions.

#### Basic

These allow editing of model fields. The `FieldPanel` class will choose the correct widget based on the type of the field, though `StreamField` fields need to use a specialised panel class.

- [`FieldPanel`](#)
- [`StreamFieldPanel`](#)

#### Structural

These are used for structuring fields in the interface.

- [`MultiFieldPanel`](#) - For grouping similar fields together
- [`InlinePanel`](#) - For inlining child models
- [`FieldRowPanel`](#) - For organising multiple fields into a single row

#### Chooser

`ForeignKey` fields to certain models can use one of the below `ChooserPanel` classes. These add a nice modal chooser interface, and the image/document choosers also allow uploading new files without leaving the page editor.

- [`PageChooserPanel`](#)
- [`ImageChooserPanel`](#)
- [`DocumentChooserPanel`](#)
- [`SnippetChooserPanel`](#)

---

**Note:** In order to use one of these choosers, the model being linked to must either be a page, image, document or snippet.

To link to any other model type, you should use `FieldPanel`, which will create a dropdown box.

---

**Customising the page editor interface** The page editor can be customised further. See [Customising the editing interface](#).

### Parent page / subpage type rules

These two attributes allow you to control where page types may be used in your site. It allows you to define rules like “blog entries may only be created under a blog index”.

Both take a list of model classes or model names. Model names are of the format `app_label.ModelName`. If the `app_label` is omitted, the same app is assumed.

- `parent_page_types` limits which page types this type can be created under
- `subpage_types` limits which page types can be created under this type

By default, any page type can be created under any page type and it is not necessary to set these attributes if that’s the desired behaviour.

Setting `parent_page_types` to an empty list is a good way of preventing a particular page type from being created in the editor interface.

### Template rendering

Each page model can be given an HTML template which is rendered when a user browses to a page on the site frontend. This is the simplest and most common way to get Wagtail content to end users (but not the only way).

#### Adding a template for a page model

Wagtail automatically chooses a name for the template based on the app label and model class name.

Format: `<app_label>/<model_name (snake cased)>.html`

For example, the template for the above blog page will be: `blog/blog_page.html`

You just need to create a template in a location where it can be accessed with this name.

### Template context

Wagtail renders templates with the `page` variable bound to the page instance being rendered. Use this to access the content of the page. For example, to get the title of the current page, use `{% page.title %}`. All variables provided by [context processors](#) are also available.

**Customising template context** All pages have a `get_context` method that is called whenever the template is rendered and returns a dictionary of variables to bind into the template.

To add more variables to the template context, you can override this method:

```
class BlogIndexPage(Page):
    ...

    def get_context(self, request):
        context = super(BlogIndexPage, self).get_context(request)

        # Add extra variables and return the updated context
        context['blog_entries'] = BlogPage.objects.child_of(self).live()
        return context
```

The variables can then be used in the template:

```
{{ page.title }}

{% for entry in blog_entries %}
    {{ entry.title }}
{% endfor %}
```

### Changing the template

Set the `template` attribute on the class to use a different template file:

```
class BlogPage(Page):
    ...

    template = 'other_template.html'
```

**Dynamically choosing the template** The template can be changed on a per-instance basis by defining a `get_template` method on the page class. This method is called every time the page is rendered:

```
class BlogPage(Page):
    ...

    use_other_template = models.BooleanField()

    def get_template(self, request):
        if self.use_other_template:
            return 'blog/other_blog_page.html'

        return 'blog/blog_page.html'
```

In this example, pages that have the `use_other_template` boolean field set will use the `blog/other_blog_page.html` template. All other pages will use the default `blog/blog_page.html`.

### More control over page rendering

All page classes have a `serve()` method that internally calls the `get_context` and `get_template` methods and renders the template. This method is similar to a Django view function, taking a Django `Request` object and returning a Django `Response` object.

This method can also be overridden for complete control over page rendering.

For example, here's a way to make a page respond with a JSON representation of itself:

```
from django.http import JsonResponse

class BlogPage(Page):
    ...

    def serve(self, request):
        return JsonResponse({
            'title': self.title,
            'body': self.body,
            'date': self.date,

            # Resizes the image to 300px width and gets a URL to it
            'feed_image': self.feed_image.get_rendition('width-300').url,
        })
    }
```

## Inline models

Wagtail can nest the content of other models within the page. This is useful for creating repeated fields, such as related links or items to display in a carousel. Inline model content is also versioned with the rest of the page content.

Each inline model requires the following:

- It must inherit from `wagtail.wagtailcore.models.Orderable`
- It must have a `ParentalKey` to the parent model

---

**Note:** `django-modelcluster` and `ParentalKey`

The model inlining feature is provided by `django-modelcluster` and the `ParentalKey` field type must be imported from there:

```
from modelcluster.fields import ParentalKey
```

`ParentalKey` is a subclass of Django's `ForeignKey`, and takes the same arguments.

---

For example, the following inline model can be used to add related links (a list of name, url pairs) to the `BlogPage` model:

```
from django.db import models
from modelcluster.fields import ParentalKey
from wagtail.wagtailcore.models import Orderable

class BlogPageRelatedLink(Orderable):
    page = ParentalKey(BlogPage, related_name='related_links')
    name = models.CharField(max_length=255)
    url = models.URLField()

    panels = [
        FieldPanel('name'),
        FieldPanel('url'),
    ]
```

To add this to the admin interface, use the `InlinePanel` edit panel class:

```
content_panels = [
    ...
    InlinePanel('related_links', label="Related links"),
]
```

The first argument must match the value of the `related_name` attribute of the `ParentalKey`.

## Working with pages

Wagtail uses Django's [multi-table inheritance](#) feature to allow multiple page models to be used in the same tree.

Each page is added to both Wagtail's builtin `Page` model as well as its user-defined model (such as the `BlogPage` model created earlier).

Pages can exist in Python code in two forms, an instance of `Page` or an instance of the page model.

When working with multiple page types together, you will typically use instances of Wagtail's `Page` model, which don't give you access to any fields specific to their type.

```
# Get all pages in the database
>>> from wagtail.wagtailcore.models import Page
>>> Page.objects.all()
[<Page: Homepage>, <Page: About us>, <Page: Blog>, <Page: A Blog post>, <Page: Another Blog post>]
```

When working with a single page type, you can work with instances of the user-defined model. These give access to all the fields available in `Page`, along with any user-defined fields for that type.

```
# Get all blog entries in the database
>>> BlogPage.objects.all()
[<BlogPage: A Blog post>, <BlogPage: Another Blog post>]
```

You can convert a `Page` object to its more specific user-defined equivalent using the `.specific` property. This may cause an additional database lookup.

```
>>> page = Page.objects.get(title="A Blog post")
>>> page
<Page: A Blog post>

# Note: the blog post is an instance of Page so we cannot access body, date or feed_image

>>> page.specific
<BlogPage: A Blog post>
```

## Tips

### Friendly model names

You can make your model names more friendly to users of Wagtail by using Django's internal `Meta` class with a `verbose_name`, e.g.:

```
class HomePage(Page):
    ...

    class Meta:
        verbose_name = "homepage"
```

When users are given a choice of pages to create, the list of page types is generated by splitting your model names on each of their capital letters. Thus a `HomePage` model would be named “Home Page” which is a little clumsy. Defining `verbose_name` as in the example above would change this to read “Homepage”, which is slightly more conventional.

## Page QuerySet ordering

Page-derived models *cannot* be given a default ordering by using the standard Django approach of adding an `ordering` attribute to the internal `Meta` class.

```
class NewsItemPage(Page):
    publication_date = models.DateField()
    ...

    class Meta:
        ordering = ('-publication_date', ) # will not work
```

This is because Page enforces ordering QuerySets by path. Instead, you must apply the ordering explicitly when constructing a `QuerySet`:

```
news_items = NewsItemPage.objects.live().order_by('-publication_date')
```

## Custom Page managers

You can add a custom Manager to your Page class. Any custom Managers should inherit from `wagtail.wagtailcore.models.PageManager`:

```
from django.db import models
from wagtail.wagtailcore.models import Page, PageManager

class EventPageManager(PageManager):
    """ Custom manager for Event pages """

class EventPage(Page):
    start_date = models.DateField()

    objects = EventPageManager()
```

Alternately, if you only need to add extra QuerySet methods, you can inherit from `wagtail.wagtailcore.models.PageQuerySet`, and call `from_queryset()` to build a custom Manager:

```
from django.db import models
from django.utils import timezone
from wagtail.wagtailcore.models import Page, PageManager, PageQuerySet

class EventPageQuerySet(PageQuerySet):
    def future(self):
        today = timezone.localtime(timezone.now()).date()
        return self.filter(start_date__gte=today)

class EventPage(Page):
    start_date = models.DateField()

    objects = PageManager.from_queryset(EventPageQuerySet)
```

## Writing templates

Wagtail uses Django's templating language. For developers new to Django, start with Django's own template documentation: <https://docs.djangoproject.com/en/dev/topics/templates/>

Python programmers new to Django/Wagtail may prefer more technical documentation: <https://docs.djangoproject.com/en/dev/ref/templates/api/>

You should be familiar with Django templating basics before continuing with this documentation.

### Templates

Every type of page or “content type” in Wagtail is defined as a “model” in a file called `models.py`. If your site has a blog, you might have a `BlogPage` model and another called `BlogPageListing`. The names of the models are up to the Django developer.

For each page model in `models.py`, Wagtail assumes an HTML template file exists of (almost) the same name. The Front End developer may need to create these templates themselves by referring to `models.py` to infer template names from the models defined therein.

To find a suitable template, Wagtail converts CamelCase names to snake\_case. So for a `BlogPage`, a template `blog_page.html` will be expected. The name of the template file can be overridden per model if necessary.

Template files are assumed to exist here:

```
name_of_project/
    name_of_app/
        templates/
            name_of_app/
                blog_page.html
models.py
```

For more information, see the Django documentation for the [application directories template loader](#).

### Page content

The data/content entered into each page is accessed/output through Django's `{{ double-brace }}` notation. Each field from the model must be accessed by prefixing `page..` e.g the page title `{{ page.title }}` or another field `{{ page.author }}`.

Additionally `request.` is available and contains Django's request object.

### Static assets

Static files e.g CSS, JS and images are typically stored here:

```
name_of_project/
    name_of_app/
        static/
            name_of_app/
                css/
                js/
                images/
models.py
```

(The names “css”, “js” etc aren’t important, only their position within the tree.)

Any file within the static folder should be inserted into your HTML using the `{% static %}` tag. More about it: [Static files \(tag\)](#).

## User images

Images uploaded to a Wagtail site by its users (as opposed to a developer’s static files, mentioned above) go into the image library and from there are added to pages via the [page editor interface](#).

Unlike other CMSs, adding images to a page does not involve choosing a “version” of the image to use. Wagtail has no predefined image “formats” or “sizes”. Instead the template developer defines image manipulation to occur *on the fly* when the image is requested, via a special syntax within the template.

Images from the library must be requested using this syntax, but a developer’s static images can be added via conventional means e.g `img` tags. Only images from the library can be manipulated on the fly.

Read more about the image manipulation syntax here [Using images in templates](#).

## Template tags & filters

In addition to Django’s standard tags and filters, Wagtail provides some of its own, which can be `load-ed` just like any other.

### Images (tag)

The `image` tag inserts an XHTML-compatible `img` element into the page, setting its `src`, `width`, `height` and `alt`. See also [More control over the img tag](#).

The syntax for the `image` tag is thus:

```
{% image [image] [resize-rule] %}
```

For example:

```
{% load wagtailimages_tags %}  
...  
{% image page.photo width=400 %}  
  
<!-- or a square thumbnail: -->  
{% image page.photo fill=80x80 %}
```

See [Using images in templates](#) for full documentation.

### Rich text (filter)

This filter takes a chunk of HTML content and renders it as safe HTML in the page. Importantly, it also expands internal shorthand references to embedded images, and links made in the Wagtail editor, into fully-baked HTML ready for display.

Only fields using `RichTextField` need this applied in the template.

```
{% load wagtailcore_tags %}  
...  
{% page.body|richtext %}
```

**Responsive Embeds** Wagtail includes embeds and images at their full width, which may overflow the bounds of the content container you've defined in your templates. To make images and embeds responsive – meaning they'll resize to fit their container – include the following CSS.

```
.rich-text img {
    max-width: 100%;
    height: auto;
}

.responsive-object {
    position: relative;
}

.responsive-object iframe,
.responsive-object object,
.responsive-object embed {
    position: absolute;
    top: 0;
    left: 0;
    width: 100%;
    height: 100%;
}
```

### Internal links (tag)

**pageurl** Takes a Page object and returns a relative URL (/foo/bar/) if within the same Site as the current page, or absolute (<http://example.com/foo/bar/>) if not.

```
{% load wagtailcore_tags %}
...
<a href="{% pageurl page.blog_page %}">
```

**slugurl** Takes any slug as defined in a page's "Promote" tab and returns the URL for the matching Page. Like pageurl, this will try to provide a relative link if possible, but will default to an absolute link if the Page is on a different Site. This is most useful when creating shared page furniture, e.g. top level navigation or site-wide links.

```
{% load wagtailcore_tags %}
...
<a href="{% slugurl page.your_slug %}">
```

### Static files (tag)

Used to load anything from your static files directory. Use of this tag avoids rewriting all static paths if hosting arrangements change, as they might between development and live environments.

```
{% load static %}
...

```

Notice that the full path name is not required and the path snippet you enter only need begin with the parent app's directory name.

## Wagtail User Bar

This tag provides a contextual flyout menu for logged-in users. The menu gives editors the ability to edit the current page or add a child page, besides the options to show the page in the Wagtail page explorer or jump to the Wagtail admin dashboard. Moderators are also given the ability to accept or reject a page being previewed as part of content moderation.

```
{% load wagtailuserbar %}  
...  
{% wagtailuserbar %}
```

By default the User Bar appears in the bottom right of the browser window, inset from the edge. If this conflicts with your design it can be moved by passing a parameter to the template tag. These examples show you how to position the userbar in each corner of the screen:

```
...  
{% wagtailuserbar 'top-left' %}  
{% wagtailuserbar 'top-right' %}  
{% wagtailuserbar 'bottom-left' %}  
{% wagtailuserbar 'bottom-right' %}  
...
```

The userbar can be positioned where it works best with your design. Alternatively, you can position it with a css rule in your own CSS files, for example:

```
.wagtail-userbar {  
    top: 200px !important;  
    left: 10px !important;  
}
```

## Varying output between preview and live

Sometimes you may wish to vary the template output depending on whether the page is being previewed or viewed live. For example, if you have visitor tracking code such as Google Analytics in place on your site, it's a good idea to leave this out when previewing, so that editor activity doesn't appear in your analytics reports. Wagtail provides a `request.is_preview` variable to distinguish between preview and live:

```
{% if not request.is_preview %}  
    <script>  
        (function(i,s,o,g,r,a,m){i['GoogleAnalyticsObject']=r;i[r]=i[r]||function(){  
            ...  
        }  
    </script>  
{% endif %}
```

## Using images in templates

The `image` tag inserts an XHTML-compatible `img` element into the page, setting its `src`, `width`, `height` and `alt`. See also [More control over the `img` tag](#).

The syntax for the tag is thus:

```
{% image [image] [resize-rule] %}
```

For example:

```
{% load wagtailimages_tags %}  
...  
<!-- Display the image scaled to a width of 400 pixels: -->  
{% image page.photo width-400 %}  
<!-- Display it again, but this time as a square thumbnail: -->  
{% image page.photo fill-80x80 %}
```

In the above syntax example `[image]` is the Django object referring to the image. If your page model defined a field called “photo” then `[image]` would probably be `page.photo`. The `[resize-rule]` defines how the image is to be resized when inserted into the page. Various resizing methods are supported, to cater to different use cases (e.g. lead images that span the whole width of the page, or thumbnails to be cropped to a fixed size).

Note that a space separates `[image]` and `[resize-rule]`, but the resize rule must not contain spaces. The width is always specified before the height. Resized images will maintain their original aspect ratio unless the `fill` rule is used, which may result in some pixels being cropped.

The available resizing methods are as follows:

**max** (takes two dimensions)

```
{% image page.photo max-1000x500 %}
```

Fit **within** the given dimensions.

The longest edge will be reduced to the matching dimension specified. For example, a portrait image of width 1000 and height 2000, treated with the `max-1000x500` rule (a landscape layout) would result in the image being shrunk so the `height` was 500 pixels and the width was 250.

**min** (takes two dimensions)

```
{% image page.photo min-500x200 %}
```

Cover the given dimensions.

This may result in an image slightly **larger** than the dimensions you specify. A square image of width 2000 and height 2000, treated with the `min-500x200` rule would have its height and width changed to 500, i.e matching the `width` of the resize-rule, but greater than the height.

**width** (takes one dimension)

```
{% image page.photo width-640 %}
```

Reduces the width of the image to the dimension specified.

**height** (takes one dimension)

```
{% image page.photo height-480 %}
```

Resize the height of the image to the dimension specified.

**fill** (takes two dimensions and an optional `-c` parameter)

```
{% image page.photo fill-200x200 %}
```

Resize and **crop** to fill the **exact** dimensions specified.

This can be particularly useful for websites requiring square thumbnails of arbitrary images. For example, a landscape image of width 2000 and height 1000 treated with the `fill200x200` rule would have its height reduced to 200, then its width (ordinarily 400) cropped to 200.

This resize-rule will crop to the image's focal point if it has been set. If not, it will crop to the centre of the image.

### On images that won't upscale

It's possible to request an image with `fill` dimensions that the image can't support without upscaling. e.g. an image of width 400 and height 200 requested with `fill-400x400`. In this situation the *ratio of the requested fill* will be matched, but the dimension will not. So that example 400x200 image (a 2:1 ratio) could become 200x200 (a 1:1 ratio, matching the resize-rule).

### Cropping closer to the focal point

By default, Wagtail will only crop enough to change the aspect ratio of the image to match the ratio in the resize-rule.

In some cases (e.g. thumbnails), it may be preferable to crop closer to the focal point, so that the subject of the image is more prominent.

You can do this by appending `-c<percentage>` at the end of the resize-rule. For example, if you would like the image to be cropped as closely as possible to its focal point, add `-c100`:

```
{% image page.photo fill-200x200-c100 %}
```

This will crop the image as much as it can, without cropping into the focal point.

If you find that `-c100` is too close, you can try `-c75` or `-c50`. Any whole number from 0 to 100 is accepted.

### `original` (takes no dimensions)

```
{% image page.photo original %}
```

Renders the image at its original size.

---

**Note:** Wagtail does not allow deforming or stretching images. Image dimension ratios will always be kept. Wagtail also *does not support upscaling*. Small images forced to appear at larger sizes will “max out” at their native dimensions.

---

## More control over the `img` tag

Wagtail provides two shortcuts to give greater control over the `img` element:

### 1. Adding attributes to the `{% image %}` tag

Extra attributes can be specified with the syntax `attribute="value"`:

```
{% image page.photo width-400 class="foo" id="bar" %}
```

You can set a more relevant `alt` attribute this way, overriding the one automatically generated from the title of the image. The `src`, `width`, and `height` attributes can also be overridden, if necessary.

### 2. Generating the image “as foo” to access individual properties

Wagtail can assign the image data to another variable using Django's `as` syntax:

```
{% image page.photo width-400 as tmp_photo %}

![{{ tmp_photo.alt }}]({{ tmp_photo.url }})

```

This syntax exposes the underlying image Rendition (`tmp_photo`) to the developer. A “Rendition” contains the information specific to the way you’ve requested to format the image using the resize-rule, i.e. dimensions and source URL.

If your site defines a custom image model using `AbstractImage`, any additional fields you add to an image (e.g. a copyright holder) are **not** included in the rendition.

Therefore, if you’d added the field `author` to your `AbstractImage` in the above example, you’d access it using `{ page.photo.author }` rather than `{ tmp_photo.author }`.

(Due to the links in the database between renditions and their parent image, you *could* access it as `{ tmp_photo.image.author }`, but that has reduced readability.)

---

**Note:** The image property used for the `src` attribute is actually `image.url`, not `image.src`.

---

### The `attrs` shortcut

You can also use the `attrs` property as a shorthand to output the attributes `src`, `width`, `height` and `alt` in one go:

```
<img {{ tmp_photo.attrs }} class="my-custom-class" />
```

### Images embedded in rich text

The information above relates to images defined via image-specific fields in your model. However, images can also be embedded arbitrarily in Rich Text fields by the page editor (see [Rich Text \(HTML\)](#)).

Images embedded in Rich Text fields can’t be controlled by the template developer as easily. There are no image objects to work with, so the `{% image %}` template tag can’t be used. Instead, editors can choose from one of a number of image “Formats” at the point of inserting images into their text.

Wagtail comes with three pre-defined image formats, but more can be defined in Python by the developer. These formats are:

**Full width** Creates an image rendition using `width=800`, giving the `<img>` tag the CSS class `full-width`.

**Left-aligned** Creates an image rendition using `width=500`, giving the `<img>` tag the CSS class `left`.

**Right-aligned** Creates an image rendition using `width=500`, giving the `<img>` tag the CSS class `right`.

---

**Note:** The CSS classes added to images do **not** come with any accompanying stylesheets, or inline styles. e.g. the `left` class will do nothing, by default. The developer is expected to add these classes to their front end CSS files, to define exactly what they want `left`, `right` or `full-width` to mean.

---

For more information about image formats, including creating your own, see [Image Formats in the Rich Text Editor](#)

### Output image format

Wagtail may automatically change the format of some images when they are resized:

- PNG and JPEG images don’t change format
- GIF images without animation are converted to PNGs
- BMP images are converted to PNGs

It is also possible to override the output format on a per-tag basis by using the `format` filter after the resize rule.

For example, to make the tag always convert the image to a JPEG, use `format-jpeg`:

```
{% image page.photo width-400 format-jpeg %}
```

You may also use `format-png` or `format-gif`.

## JPEG image quality

Wagtail's JPEG image quality setting defaults to 85 (which is quite high). This can be changed either globally or on a per-tag basis.

### Changing globally

Use the `WAGTAILIMAGES_JPEG_QUALITY` setting to change the global default JPEG quality:

```
# settings.py

# Make low-quality but small images
WAGTAILIMAGES_JPEG_QUALITY = 40
```

Note that this won't affect any previously generated images so you may want to delete all renditions so they can regenerate with the new setting. This can be done from the Django shell:

```
# Replace this with your custom rendition model if you use one
>>> from wagtail.wagtailimages.models import Rendition
>>> Rendition.objects.all().delete()
```

### Changing per-tag

It's also possible to have different JPEG qualities on individual tags by using the `jpegquality` filter. This will always override the default setting:

```
{% image page.photo width-400 jpegquality-40 %}
```

Note that this will have no effect on PNG or GIF files. If you want all images to be low quality, you can use this filter with `format-jpeg` (which forces all images to output in JPEG format):

```
{% image page.photo width-400 format-jpeg jpegquality-40 %}
```

## Search

Wagtail provides a comprehensive and extensible search interface. In addition, it provides ways to promote search results through "Editor's Picks". Wagtail also collects simple statistics on queries made through the search interface.

### Indexing

To make a model searchable, you'll need to add it into the search index. All pages, images and documents are indexed for you, so you can start searching them right away.

If you have created some extra fields in a subclass of `Page` or `Image`, you may want to add these new fields to the search index too so that a user's search query will match on their content. See [Indexing extra fields](#) for info on how to do this.

If you have a custom model that you would like to make searchable, see [Indexing custom models](#).

### Updating the index

If the search index is kept separate from the database (when using Elasticsearch for example), you need to keep them both in sync. There are two ways to do this: using the search signal handlers, or calling the `update_index` command periodically. For best speed and reliability, it's best to use both if possible.

**Signal handlers** Changed in version 0.8: Signal handlers are now automatically registered

`wagtailsearch` provides some signal handlers which bind to the save/delete signals of all indexed models. This would automatically add and delete them from all backends you have registered in `WAGTAILSEARCH_BACKENDS`. These signal handlers are automatically registered when the `wagtail.wagtailsearch` app is loaded.

**The `update_index` command** Wagtail also provides a command for rebuilding the index from scratch.

```
./manage.py update_index
```

It is recommended to run this command once a week and at the following times:

- whenever any pages have been created through a script (after an import, for example)
- whenever any changes have been made to models or search configuration

The search may not return any results while this command is running, so avoid running it at peak times.

### Indexing extra fields

**Warning:** Indexing extra fields is only supported with ElasticSearch as your backend. If you're using the database backend, any other fields you define via `search_fields` will be ignored.

Fields must be explicitly added to the `search_fields` property of your Page-derived model, in order for you to be able to search/filter on them. This is done by overriding `search_fields` to append a list of extra `SearchField/FilterField` objects to it.

**Example** This creates an `EventPage` model with two fields: `description` and `date`. `description` is indexed as a `SearchField` and `date` is indexed as a `FilterField`

```
from wagtail.wagtailsearch import index
from django.utils import timezone

class EventPage(Page):
    description = models.TextField()
    date = models.DateField()

    search_fields = Page.search_fields + [ # Inherit search_fields from Page
        index.SearchField('description'),
        index.FilterField('date'),
    ]

# Get future events which contain the string "Christmas" in the title or description
>>> EventPage.objects.filter(date__gt=timezone.now()).search("Christmas")
```

**index.SearchField** These are used for performing full-text searches on your models, usually for text fields.

## Options

- **partial\_match** (boolean) - Setting this to true allows results to be matched on parts of words. For example, this is set on the title field by default, so a page titled Hello World! will be found if the user only types Hel into the search box.
- **boost** (int/float) - This allows you to set fields as being more important than others. Setting this to a high number on a field will cause pages with matches in that field to be ranked higher. By default, this is set to 2 on the Page title field and 1 on all other fields.
- **es\_extra** (dict) - This field is to allow the developer to set or override any setting on the field in the ElasticSearch mapping. Use this if you want to make use of any ElasticSearch features that are not yet supported in Wagtail.

**index.FilterField** These are added to the search index but are not used for full-text searches. Instead, they allow you to run filters on your search results.

**index.RelatedFields** This allows you to index fields from related objects. It works on all types of related fields, including their reverse accessors.

For example, if we have a book that has a ForeignKey to its author, we can nest the author's name and date\_of\_birth fields inside the book:

```
class Book(models.Model, indexed.Indexed):
    ...

    search_fields = [
        index.SearchField('title'),
        index.FilterField('published_date'),

        index.RelatedFields('author', [
            index.SearchField('name'),
            index.FilterField('date_of_birth'),
        ]),
    ]
]
```

This will allow you to search for books by their author's name.

It works the other way around as well. You can index an author's books, allowing an author to be searched for by the titles of books they've published:

```
class Author(models.Model, indexed.Indexed):
    ...

    search_fields = [
        index.SearchField('name'),
        index.FilterField('date_of_birth'),

        index.RelatedFields('books', [
            index.SearchField('title'),
            index.FilterField('published_date'),
        ]),
    ]
]
```

### Filtering on `index.RelatedFields`

It's not possible to filter on any `index.FilterFields` within `index.RelatedFields` using the `QuerySet` API. However, the fields are indexed, so it should be possible to use them by querying Elasticsearch manually.

Filtering on `index.RelatedFields` with the `QuerySet` API is planned for a future release of Wagtail.

### Indexing callables and other attributes

---

**Note:** This is not supported in the *Database Backend (default)*

---

Search/filter fields do not need to be Django model fields. They can also be any method or attribute on your model class.

One use for this is indexing the `get_*_display` methods Django creates automatically for fields with choices.

```
from wagtail.wagtailsearch import index

class EventPage(Page):
    IS_PRIVATE_CHOICES = (
        (False, "Public"),
        (True, "Private"),
    )

    is_private = models.BooleanField(choices=IS_PRIVATE_CHOICES)

    search_fields = Page.search_fields + [
        # Index the human-readable string for searching.
        index.SearchField('get_is_private_display'),

        # Index the boolean value for filtering.
        index.FilterField('is_private'),
    ]
```

Callables also provide a way to index fields from related models. In the example from *Inline Panels and Model Clusters*, to index each BookPage by the titles of its related\_links:

```
class BookPage(Page):
    # ...
    def get_related_link_titles(self):
        # Get list of titles and concatenate them
        return '\n'.join(self.related_links.all().values_list('name', flat=True))

    search_fields = Page.search_fields + [
        # ...
        index.SearchField('get_related_link_titles'),
    ]
```

### Indexing custom models

Any Django model can be indexed and searched.

To do this, inherit from `index.Indexed` and add some `search_fields` to the model.

```

from wagtail.wagtailsearch import index

class Book(index.Indexed, models.Model):
    title = models.CharField(max_length=255)
    genre = models.CharField(max_length=255, choices=GENRE_CHOICES)
    author = models.ForeignKey(Author)
    published_date = models.DateTimeField()

    search_fields = [
        index.SearchField('title', partial_match=True, boost=10),
        index.SearchField('get_genre_display'),

        index.FilterField('genre'),
        index.FilterField('author'),
        index.FilterField('published_date'),
    ]

# As this model doesn't have a search method in its QuerySet, we have to call search directly on the
>>> from wagtail.wagtailsearch.backends import get_search_backend
>>> s = get_search_backend()

# Run a search for a book by Roald Dahl
>>> roald_dahl = Author.objects.get(name="Roald Dahl")
>>> s.search("chocolate factory", Book.objects.filter(author=roald_dahl))
[<Book: Charlie and the chocolate factory>]

```

## Searching

### Searching QuerySets

Wagtail search is built on Django's [QuerySet API](#). You should be able to search any Django QuerySet provided the model and the fields being filtered on have been added to the search index.

**Searching Pages** Wagtail provides a shortcut for searching pages: the `.search()` QuerySet method. You can call this on any `PageQuerySet`. For example:

```

# Search future EventPages
>>> from wagtail.wagtailcore.models import EventPage
>>> EventPage.objects.filter(date__gt=timezone.now()).search("Hello world!")

```

All other methods of `PageQuerySet` can be used with `search()`. For example:

```

# Search all live EventPages that are under the events index
>>> EventPage.objects.live().descendant_of(events_index).search("Event")
[<EventPage: Event 1>, <EventPage: Event 2>]

```

---

**Note:** The `search()` method will convert your `QuerySet` into an instance of one of Wagtail's `SearchResults` classes (depending on backend). This means that you must perform filtering before calling `search()`.

---

**Searching Images, Documents and custom models** Wagtail's document and image models provide a `search` method on their `QuerySets`, just as pages do:

```
>>> from wagtail.wagtailimages.models import Image  
  
>>> Image.objects.filter(uploaded_by_user=user).search("Hello")  
[<Image: Hello>, <Image: Hello world!>]
```

*Custom models* can be searched by using the `search` method on the search backend directly:

```
>>> from myapp.models import Book  
>>> from wagtail.wagtailsearch.backends import get_search_backend  
  
# Search books  
>>> s = get_search_backend()  
>>> s.search("Great", Book)  
[<Book: Great Expectations>, <Book: The Great Gatsby>]
```

You can also pass a `QuerySet` into the `search` method which allows you to add filters to your search results:

```
>>> from myapp.models import Book  
>>> from wagtail.wagtailsearch.backends import get_search_backend  
  
# Search books  
>>> s = get_search_backend()  
>>> s.search("Great", Book.objects.filter(published_date__year__lt=1900))  
[<Book: Great Expectations>]
```

**Specifying the fields to search** By default, Wagtail will search all fields that have been indexed using `index.SearchField`.

This can be limited to a certain set of fields by using the `fields` keyword argument:

```
# Search just the title field  
>>> EventPage.objects.search("Event", fields=["title"])  
[<EventPage: Event 1>, <EventPage: Event 2>]
```

### Changing search behaviour

**Search operator** New in version 1.2.

The search operator specifies how search should behave when the user has typed in multiple search terms. There are two possible values:

- “or” - The results must match at least one term (default for Elasticsearch)
- “and” - The results must match all terms (default for database search)

Both operators have benefits and drawbacks. The “or” operator will return many more results but will likely contain a lot of results that aren’t relevant. The “and” operator only returns results that contain all search terms, but require the user to be more precise with their query.

We recommend using the “or” operator when ordering by relevance and the “and” operator when ordering by anything else (note: the database backend doesn’t currently support ordering by relevance).

Here’s an example of using the `operator` keyword argument:

```
# The database contains a "Thing" model with the following items:  
# - Hello world  
# - Hello  
# - World
```

```
# Search with the "or" operator
>>> s = get_search_backend()
>>> s.search("Hello world", Things, operator="or")

# All records returned as they all contain either "hello" or "world"
[<Thing: Hello World>, <Thing: Hello>, <Thing: World>]

# Search with the "and" operator
>>> s = get_search_backend()
>>> s.search("Hello world", Things, operator="and")

# Only "hello world" returned as that's the only item that contains both terms
[<Thing: Hello world>]
```

For page, image and document models, the `operator` keyword argument is also supported on the `QuerySet`'s `search` method:

```
>>> Page.objects.search("Hello world", operator="or")

# All pages containing either "hello" or "world" are returned
[<Page: Hello World>, <Page: Hello>, <Page: World>]
```

### Custom ordering New in version 1.2.

By default, search results are ordered by relevance, if the backend supports it. To preserve the `QuerySet`'s existing ordering, the `order_by_relevance` keyword argument needs to be set to `False` on the `search()` method.

For example:

```
# Get a list of events ordered by date
>>> EventPage.objects.order_by('date').search("Event", order_by_relevance=False)

# Events ordered by date
[<EventPage: Easter>, <EventPage: Halloween>, <EventPage: Christmas>]
```

### Annotating results with score New in version 1.7.

For each matched result, Elasticsearch calculates a “score”, which is a number that represents how relevant the result is based on the user’s query. The results are usually ordered based on the score.

There are some cases where having access to the score is useful (such as programmatically combining two queries for different models). You can add the score to each result by calling the `.annotate_score(field)` method on the `SearchQuerySet`.

For example:

```
>>> events = EventPage.objects.search("Event").annotate_score("_score")
>>> for event in events:
...     print(event.title, event._score)
...
("Easter", 2.5),
("Halloween", 1.7),
("Christmas", 1.5),
```

Note that the score itself is arbitrary and it is only useful for comparison of results for the same query.

### An example page search view

Here's an example Django view that could be used to add a "search" page to your site:

```
# views.py

from django.shortcuts import render

from wagtail.wagtailcore.models import Page
from wagtail.wagtailsearch.models import Query


def search(request):
    # Search
    search_query = request.GET.get('query', None)
    if search_query:
        search_results = Page.objects.live().search(search_query)

        # Log the query so Wagtail can suggest promoted results
        Query.get(search_query).add_hit()
    else:
        search_results = Page.objects.none()

    # Render template
    return render(request, 'search_results.html', {
        'search_query': search_query,
        'search_results': search_results,
    })
```

And here's a template to go with it:

```
{% extends "base.html" %}
{% load wagtailcore_tags %}

{% block title %}Search{% endblock %}

{% block content %}
    <form action="{% url 'search' %}" method="get">
        <input type="text" name="query" value="{{ search_query }}">
        <input type="submit" value="Search">
    </form>

    {% if search_results %}
        <ul>
            {% for result in search_results %}
                <li>
                    <h4><a href="{% pageurl result %}">{{ result }}</a></h4>
                    {% if result.search_description %}
                        {{ result.search_description|safe }}
                    {% endif %}
                </li>
            {% endfor %}
        </ul>
    {% elif search_query %}
        No results found
    {% else %}
        Please type something into the search box
    {% endif %}
{% endblock %}
```

## Promoted search results

“Promoted search results” allow editors to explicitly link relevant content to search terms, so results pages can contain curated content in addition to results from the search engine.

This functionality is provided by the `wagtailsearchpromotions` contrib module.

## Backends

Wagtailsearch has support for multiple backends, giving you the choice between using the database for search or an external service such as Elasticsearch. The database backend is enabled by default.

You can configure which backend to use with the `WAGTAILSEARCH_BACKENDS` setting:

```
WAGTAILSEARCH_BACKENDS = {
    'default': {
        'BACKEND': 'wagtail.wagtailsearch.backends.db',
    }
}
```

### `AUTO_UPDATE`

New in version 1.0.

By default, Wagtail will automatically keep all indexes up to date. This could impact performance when editing content, especially if your index is hosted on an external service.

The `AUTO_UPDATE` setting allows you to disable this on a per-index basis:

```
WAGTAILSEARCH_BACKENDS = {
    'default': {
        'BACKEND': ...,
        'AUTO_UPDATE': False,
    }
}
```

If you have disabled auto update, you must run the `update_index` command on a regular basis to keep the index in sync with the database.

### `ATOMIC_REBUILD`

New in version 1.1.

By default (when using the Elasticsearch backend), when the `update_index` command is run, Wagtail deletes the index and rebuilds it from scratch. This causes the search engine to not return results until the rebuild is complete and is also risky as you can't rollback if an error occurs.

Setting the `ATOMIC_REBUILD` setting to `True` makes Wagtail rebuild into a separate index while keep the old index active until the new one is fully built. When the rebuild is finished, the indexes are swapped atomically and the old index is deleted.

### `BACKEND`

Here's a list of backends that Wagtail supports out of the box.

### Database Backend (default) `wagtail.wagtailsearch.backends.db`

Changed in version 1.1: Before 1.1, the full path to the backend class had to be specified: `wagtail.wagtailsearch.backends.db.DBSearch`

The database backend is very basic and is intended only to be used in development and on small sites. It cannot order results by relevance, severely hampering its usefulness when searching a large collection of pages.

It also doesn't support:

- Searching on fields in subclasses of `Page` (unless the class is being searched directly)
- *Indexing callables and other attributes*
- Converting accented characters to ASCII

If any of these features are important to you, we recommend using Elasticsearch instead.

### Elasticsearch Backend `wagtail.wagtailsearch.backends.elasticsearch` (Elasticsearch 1.x)

`wagtail.wagtailsearch.backends.elasticsearch2` (Elasticsearch 2.x)

Changed in version 1.1: Before 1.1, the full path to the backend class had to be specified: `wagtail.wagtailsearch.backends.elasticsearch.ElasticSearch`

Changed in version 1.7: Support for Elasticsearch 2.x was added

Prerequisites are the [Elasticsearch service](#) itself and, via pip, the `elasticsearch-py` package:

```
pip install elasticsearch
```

The backend is configured in settings:

```
WAGTAILSEARCH_BACKENDS = {
    'default': {
        'BACKEND': 'wagtail.wagtailsearch.backends.elasticsearch2',
        'URLS': ['http://localhost:9200'],
        'INDEX': 'wagtail',
        'TIMEOUT': 5,
    }
}
```

Other than `BACKEND`, the keys are optional and default to the values shown. In addition, any other keys are passed directly to the Elasticsearch constructor as case-sensitive keyword arguments (e.g. `'max_retries': 1`).

If you prefer not to run an Elasticsearch server in development or production, there are many hosted services available, including [Bonsai](#), who offer a free account suitable for testing and development. To use Bonsai:

- Sign up for an account at [Bonsai](#)
- Use your Bonsai dashboard to create a Cluster.
- Configure URLs in the Elasticsearch entry in `WAGTAILSEARCH_BACKENDS` using the Cluster URL from your Bonsai dashboard
- Run `./manage.py update_index`

**Rolling Your Own** Wagtail search backends implement the interface defined in `wagtail/wagtail/wagtailsearch/backends/base.py`. At a minimum, the backend's `search()` method must return a collection of objects or `model.objects.none()`. For a fully-featured search backend, examine the Elasticsearch backend code in `elasticsearch.py`.

## Indexing

To make objects searchable, they must first be added to the search index. This involves configuring the models and fields that you would like to index (which is done for you for Pages, Images and Documents), and then actually inserting them into the index.

See [Updating the index](#) for information on how to keep the objects in your search index in sync with the objects in your database.

If you have created some extra fields in a subclass of `Page` or `Image`, you may want to add these new fields to the search index, so a user's search query can match the `Page` or `Image`'s extra content. See [Indexing extra fields](#).

If you have a custom model which doesn't derive from `Page` or `Image` that you would like to make searchable, see [Indexing custom models](#).

## Searching

Wagtail provides an API for performing search queries on your models. You can also perform search queries on Django QuerySets.

See [Searching](#).

## Backends

Wagtail provides two backends for storing the search index and performing search queries: Elasticsearch and the database. It's also possible to roll your own search backend.

See [Backends](#)

## Snippets

Snippets are pieces of content which do not necessitate a full webpage to render. They could be used for making secondary content, such as headers, footers, and sidebars, editable in the Wagtail admin. Snippets are Django models which do not inherit the `Page` class and are thus not organized into the Wagtail tree. However, they can still be made editable by assigning panels and identifying the model as a snippet with the `register_snippet` class decorator.

Snippets lack many of the features of pages, such as being orderable in the Wagtail admin or having a defined URL. Decide carefully if the content type you would want to build into a snippet might be more suited to a page.

### Snippet Models

Here's an example snippet from the Wagtail demo website:

```
from django.db import models
from django.utils.encoding import python_2_unicode_compatible

from wagtail.wagtailadmin.edit_handlers import FieldPanel
from wagtail.wagtailsnippets.models import register_snippet

...

@register_snippet
@python_2_unicode_compatible # provide equivalent __unicode__ and __str__ methods on Python 2
class Advert(models.Model):
    url = models.URLField(null=True, blank=True)
```

```
text = models.CharField(max_length=255)

panels = [
    FieldPanel('url'),
    FieldPanel('text'),
]

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

The `Advert` model uses the basic Django model class and defines two properties: `text` and `URL`. The editing interface is very close to that provided for Page-derived models, with fields assigned in the `panels` property. Snippets do not use multiple tabs of fields, nor do they provide the “save as draft” or “submit for moderation” features.

`@register_snippet` tells Wagtail to treat the model as a snippet. The `panels` list defines the fields to show on the snippet editing page. It’s also important to provide a string representation of the class through `def __str__(self)`: so that the snippet objects make sense when listed in the Wagtail admin.

### Including Snippets in Template Tags

The simplest way to make your snippets available to templates is with a template tag. This is mostly done with vanilla Django, so perhaps reviewing Django’s documentation for [django custom template tags](#) will be more helpful. We’ll go over the basics, though, and point out any considerations to make for Wagtail.

First, add a new python file to a `templatetags` folder within your app. The demo website, for instance uses the path `wagtailedemo/demo/templatetags/demo_tags.py`. We’ll need to load some Django modules and our app’s models, and ready the `register` decorator:

```
from django import template
from demo.models import *

register = template.Library()

...

# Advert snippets
@register.inclusion_tag('demo/tags/adverts.html', takes_context=True)
def adverts(context):
    return {
        'adverts': Advert.objects.all(),
        'request': context['request'],
    }
```

`@register.inclusion_tag()` takes two variables: a template and a boolean on whether that template should be passed a request context. It’s a good idea to include request contexts in your custom template tags, since some Wagtail-specific template tags like `pageurl` need the context to work properly. The template tag function could take arguments and filter the `adverts` to return a specific model, but for brevity we’ll just use `Advert.objects.all()`.

Here’s what’s in the template used by this template tag:

```
{% for advert in adverts %}
    <p>
        <a href="{{ advert.url }}>
            {{ advert.text }}
        </a>
    </p>
{% endfor %}
```

Then, in your own page templates, you can include your snippet template tag with:

```
{% load wagtailcore_tags demo_tags %}

...
{% block content %}
    ...
    {% adverts %}
{% endblock %}
```

## Binding Pages to Snippets

In the above example, the list of adverts is a fixed list, displayed independently of the page content. This might be what you want for a common panel in a sidebar, say – but in other scenarios you may wish to refer to a particular snippet from within a page’s content. This can be done by defining a foreign key to the snippet model within your page model, and adding a `SnippetChooserPanel` to the page’s `content_panels` list. For example, if you wanted to be able to specify an advert to appear on `BookPage`:

```
from wagtail.wagtailsnippets.edit_handlers import SnippetChooserPanel
# ...
class BookPage(Page):
    advert = models.ForeignKey(
        'demo.Advert',
        null=True,
        blank=True,
        on_delete=models.SET_NULL,
        related_name='+'
    )

    content_panels = Page.content_panels + [
        SnippetChooserPanel('advert'),
        # ...
    ]
```

The snippet could then be accessed within your template as `page.advert`.

To attach multiple adverts to a page, the `SnippetChooserPanel` can be placed on an inline child object of `BookPage`, rather than on `BookPage` itself. Here this child model is named `BookPageAdvertPlacement` (so called because there is one such object for each time that an advert is placed on a `BookPage`):

```
from django.db import models

from wagtail.wagtailcore.models import Page, Orderable
from wagtail.wagtailsnippets.edit_handlers import SnippetChooserPanel

from modelcluster.fields import ParentalKey
from modelcluster.contrib.taggit import TaggedItemManager

class BookPageAdvertPlacement(Orderable, models.Model):
    page = ParentalKey('demo.BookPage', related_name='advert_placements')
    advert = models.ForeignKey('demo.Advert', related_name='+')

    class Meta:
        verbose_name = 'Advert Placement'
        verbose_name_plural = 'Advert Placements'
```

```
verbose_name = "advert placement"
verbose_name_plural = "advert placements"

panels = [
    SnippetChooserPanel('advert'),
]

def __str__(self):
    return self.page.title + " -> " + self.advert.text

class BookPage(Page):
    ...

    content_panels = Page.content_panels + [
        InlinePanel('advert_placements', label="Adverts"),
        # ...
    ]
```

These child objects are now accessible through the page's `advert_placements` property, and from there we can access the linked Advert snippet as `advert`. In the template for `BookPage`, we could include the following:

```
{% for advert_placement in page.advert_placements.all %}
    <p>
        <a href="{{ advert_placement.advert.url }}>
            {{ advert_placement.advert.text }}
        </a>
    </p>
{% endfor %}
```

## Making Snippets Searchable

If a snippet model inherits from `wagtail.wagtailsearch.index.Indexed`, as described in [Indexing custom models](#), Wagtail will automatically add a search box to the chooser interface for that snippet type. For example, the `Advert` snippet could be made searchable as follows:

```
...

from wagtail.wagtailsearch import index

...

@register_snippet
class Advert(index.Indexed, models.Model):
    url = models.URLField(null=True, blank=True)
    text = models.CharField(max_length=255)

    panels = [
        FieldPanel('url'),
        FieldPanel('text'),
    ]

    search_fields = [
        index.SearchField('text', partial_match=True),
    ]
```

## Tagging snippets

Adding tags to snippets is very similar to adding tags to pages. The only difference is that `taggit.manager.TaggableManager` should be used in the place of `ClusterTaggableManager`.

```
from modelcluster.fields import ParentalKey
from modelcluster.models import ClusterableModel
from taggit.models import TaggedItemBase
from taggit.managers import TaggableManager

class AdvertTag(TaggedItemBase):
    content_object = ParentalKey('demo.Advert', related_name='tagged_items')

@register_snippet
class Advert(ClusterableModel):
    ...
    tags = TaggableManager(through=AdvertTag, blank=True)

    panels = [
        ...
        FieldPanel('tags'),
    ]
```

The [documentation on tagging pages](#) has more information on how to use tags in views.

## Freeform page content using StreamField

`StreamField` provides a content editing model suitable for pages that do not follow a fixed structure – such as blog posts or news stories – where the text may be interspersed with subheadings, images, pull quotes and video. It's also suitable for more specialised content types, such as maps and charts (or, for a programming blog, code snippets). In this model, these different content types are represented as a sequence of ‘blocks’, which can be repeated and arranged in any order.

For further background on `StreamField`, and why you would use it instead of a rich text field for the article body, see the blog post [Rich text fields and faster horses](#).

`StreamField` also offers a rich API to define your own block types, ranging from simple collections of sub-blocks (such as a ‘person’ block consisting of first name, surname and photograph) to completely custom components with their own editing interface. Within the database, the `StreamField` content is stored as JSON, ensuring that the full informational content of the field is preserved, rather than just an HTML representation of it.

## Using StreamField

`StreamField` is a model field that can be defined within your page model like any other field:

```
from django.db import models

from wagtail.wagtailcore.models import Page
from wagtail.wagtailcore.fields import StreamField
from wagtail.wagtailcore import blocks
from wagtail.wagtailadmin.edit_handlers import FieldPanel, StreamFieldPanel
from wagtail.wagtailimages.blocks import ImageChooserBlock

class BlogPage(Page):
    author = models.CharField(max_length=255)
    date = models.DateField("Post date")
```

```
body = StreamField([
    ('heading', blocks.CharBlock(classname="full title")),
    ('paragraph', blocks.RichTextBlock()),
    ('image', ImageChooserBlock()),
])

content_panels = Page.content_panels + [
    FieldPanel('author'),
    FieldPanel('date'),
    StreamFieldPanel('body'),
]
```

Note: StreamField is not backwards compatible with other field types such as RichTextField. If you need to migrate an existing field to StreamField, refer to [Migrating RichTextFields to StreamField](#).

The parameter to StreamField is a list of (name, block\_type) tuples. ‘name’ is used to identify the block type within templates and the internal JSON representation (and should follow standard Python conventions for variable names: lower-case and underscores, no spaces) and ‘block\_type’ should be a block definition object as described below. (Alternatively, StreamField can be passed a single StreamBlock instance - see [Structural block types](#).)

This defines the set of available block types that can be used within this field. The author of the page is free to use these blocks as many times as desired, in any order.

### Basic block types

All block types accept the following optional keyword arguments:

**default** The default value that a new ‘empty’ block should receive.

**label** The label to display in the editor interface when referring to this block - defaults to a prettified version of the block name (or, in a context where no name is assigned - such as within a ListBlock - the empty string).

**icon** The name of the icon to display for this block type in the menu of available block types. For a list of icon names, see the Wagtail style guide, which can be enabled by adding wagtail.contrib.wagtailstyleguide to your project’s INSTALLED\_APPS.

**template** The path to a Django template that will be used to render this block on the front end. See [Template rendering](#).

The basic block types provided by Wagtail are as follows:

#### CharBlock

wagtail.wagtailcore.blocks.CharBlock

A single-line text input. The following keyword arguments are accepted:

**required (default: True)** If true, the field cannot be left blank.

**max\_length, min\_length** Ensures that the string is at most or at least the given length.

**help\_text** Help text to display alongside the field.

#### TextBlock

wagtail.wagtailcore.blocks.TextBlock

A multi-line text input. As with CharBlock, the keyword arguments `required`, `max_length`, `min_length` and `help_text` are accepted.

### EmailBlock

```
wagtail.wagtailcore.blocks.EmailBlock
```

A single-line email input that validates that the email is a valid Email Address. The keyword arguments `required` and `help_text` are accepted.

For an example of EmailBlock in use, see [Example: PersonBlock](#)

### IntegerBlock

```
wagtail.wagtailcore.blocks.IntegerBlock
```

A single-line integer input that validates that the integer is a valid whole number. The keyword arguments `required`, `max_value`, `min_value` and `help_text` are accepted.

For an example of IntegerBlock in use, see [Example: PersonBlock](#)

### FloatBlock

```
wagtail.wagtailcore.blocks.FloatBlock
```

A single-line Float input that validates that the value is a valid floating point number. The keyword arguments `required`, `max_value` and `min_value` are accepted.

### DecimalBlock

```
wagtail.wagtailcore.blocks.DecimalBlock
```

A single-line decimal input that validates that the value is a valid decimal number. The keyword arguments `required`, `max_value`, `min_value`, `max_digits` and `decimal_places` are accepted.

For an example of DecimalBlock in use, see [Example: PersonBlock](#)

### RegexBlock

```
wagtail.wagtailcore.blocks.RegexBlock
```

A single-line text input that validates a string against a regex expression. The regular expression used for validation must be supplied as the first argument, or as the keyword argument `regex`. To customise the message text used to indicate a validation error, pass a dictionary as the keyword argument `error_messages` containing either or both of the keys `required` (for the message shown on an empty value) or `invalid` (for the message shown on a non-matching value):

```
blocks.RegexBlock(regex=r'^[0-9]{3}$', error_message={
    'invalid': "Not a valid library card number."
})
```

The keyword arguments `regex`, `required`, `max_length`, `min_length` and `error_messages` are accepted.

## URLBlock

```
wagtail.wagtailcore.blocks.URLBlock
```

A single-line text input that validates that the string is a valid URL. The keyword arguments `required`, `max_length`, `min_length` and `help_text` are accepted.

## BooleanBlock

```
wagtail.wagtailcore.blocks.BooleanBlock
```

A checkbox. The keyword arguments `required` and `help_text` are accepted. As with Django's `BooleanField`, a value of `required=True` (the default) indicates that the checkbox must be ticked in order to proceed. For a checkbox that can be ticked or unticked, you must explicitly pass in `required=False`.

## DateBlock

```
wagtail.wagtailcore.blocks.DateBlock
```

A date picker. The keyword arguments `required` and `help_text` are accepted.

## TimeBlock

```
wagtail.wagtailcore.blocks.TimeBlock
```

A time picker. The keyword arguments `required` and `help_text` are accepted.

## DateTimeBlock

```
wagtail.wagtailcore.blocks.DateTimeBlock
```

A combined date / time picker. The keyword arguments `required` and `help_text` are accepted.

## RichTextBlock

```
wagtail.wagtailcore.blocks.RichTextBlock
```

A WYSIWYG editor for creating formatted text including links, bold / italics etc.

## RawHTMLBlock

```
wagtail.wagtailcore.blocks.RawHTMLBlock
```

A text area for entering raw HTML which will be rendered unescaped in the page output. The keyword arguments `required`, `max_length`, `min_length` and `help_text` are accepted.

**Warning:** When this block is in use, there is nothing to prevent editors from inserting malicious scripts into the page, including scripts that would allow the editor to acquire administrator privileges when another administrator views the page. Do not use this block unless your editors are fully trusted.

## ChoiceBlock

wagtail.wagtailcore.blocks.ChoiceBlock

A dropdown select box for choosing from a list of choices. The following keyword arguments are accepted:

**choices** A list of choices, in any format accepted by Django's `choices` parameter for model fields:  
<https://docs.djangoproject.com/en/stable/ref/models/fields/#field-choices>

**required (default: True)** If true, the field cannot be left blank.

**help\_text** Help text to display alongside the field.

ChoiceBlock can also be subclassed to produce a reusable block with the same list of choices everywhere it is used. For example, a block definition such as:

```
blocks.ChoiceBlock(choices=[  
    ('tea', 'Tea'),  
    ('coffee', 'Coffee'),  
, icon='cup')
```

could be rewritten as a subclass of ChoiceBlock:

```
class DrinksChoiceBlock(blocks.ChoiceBlock):  
    choices = [  
        ('tea', 'Tea'),  
        ('coffee', 'Coffee'),  
    ]  
  
    class Meta:  
        icon = 'cup'
```

StreamField definitions can then refer to `DrinksChoiceBlock()` in place of the full ChoiceBlock definition.

## PageChooserBlock

wagtail.wagtailcore.blocks.PageChooserBlock

A control for selecting a page object, using Wagtail's page browser. The following keyword arguments are accepted:

**required (default: True)** If true, the field cannot be left blank.

**can\_choose\_root (default: False)** If true, the editor can choose the tree root as a page. Normally this would be undesirable, since the tree root is never a usable page, but in some specialised cases it may be appropriate. For example, a block providing a feed of related articles could use a PageChooserBlock to select which subsection of the site articles will be taken from, with the root corresponding to 'everywhere'.

## DocumentChooserBlock

wagtail.wagtaildocs.blocks.DocumentChooserBlock

A control to allow the editor to select an existing document object, or upload a new one. The keyword argument `required` is accepted.

### ImageChooserBlock

```
wagtail.wagtailimages.blocks.ImageChooserBlock
```

A control to allow the editor to select an existing image, or upload a new one. The keyword argument `required` is accepted.

### SnippetChooserBlock

```
wagtail.wagtailemail.blocks.SnippetChooserBlock
```

A control to allow the editor to select a snippet object. Requires one positional argument: the snippet class to choose from. The keyword argument `required` is accepted.

### EmbedBlock

```
wagtail.wagtailemail.blocks.EmbedBlock
```

A field for the editor to enter a URL to a media item (such as a YouTube video) to appear as embedded media on the page. The keyword arguments `required`, `max_length`, `min_length` and `help_text` are accepted.

## Structural block types

In addition to the basic block types above, it is possible to define new block types made up of sub-blocks: for example, a ‘person’ block consisting of sub-blocks for first name, surname and image, or a ‘carousel’ block consisting of an unlimited number of image blocks. These structures can be nested to any depth, making it possible to have a structure containing a list, or a list of structures.

### StructBlock

```
wagtail.wagtailcore.blocks.StructBlock
```

A block consisting of a fixed group of sub-blocks to be displayed together. Takes a list of `(name, block_definition)` tuples as its first argument:

```
('person', blocks.StructBlock([
    ('first_name', blocks.CharBlock(required=True)),
    ('surname', blocks.CharBlock(required=True)),
    ('photo', ImageChooserBlock()),
    ('biography', blocks.RichTextBlock()),
], icon='user'))
```

Alternatively, the list of sub-blocks can be provided in a subclass of StructBlock:

```
class PersonBlock(blocks.StructBlock):
    first_name = blocks.CharBlock(required=True)
    surname = blocks.CharBlock(required=True)
    photo = ImageChooserBlock()
    biography = blocks.RichTextBlock()

    class Meta:
        icon = 'user'
```

The Meta class supports the properties `default`, `label`, `icon` and `template`, which have the same meanings as when they are passed to the block's constructor.

This defines `PersonBlock()` as a block type that can be re-used as many times as you like within your model definitions:

```
body = StreamField([
    ('heading', blocks.CharBlock(classname="full title")),
    ('paragraph', blocks.RichTextBlock()),
    ('image', ImageChooserBlock()),
    ('person', PersonBlock()),
])
```

Further options are available for customising the display of a `StructBlock` within the page editor - see [Custom editing interfaces for StructBlock](#).

## ListBlock

```
wagtail.wagtailcore.blocks.ListBlock
```

A block consisting of many sub-blocks, all of the same type. The editor can add an unlimited number of sub-blocks, and re-order and delete them. Takes the definition of the sub-block as its first argument:

```
('ingredients_list', blocks.ListBlock(blocks.CharBlock(label="Ingredient")))
```

Any block type is valid as the sub-block type, including structural types:

```
('ingredients_list', blocks.ListBlock(blocks.StructBlock([
    ('ingredient', blocks.CharBlock(required=True)),
    ('amount', blocks.CharBlock()),
])))
```

## StreamBlock

```
wagtail.wagtailcore.blocks.StreamBlock
```

A block consisting of a sequence of sub-blocks of different types, which can be mixed and reordered at will. Used as the overall mechanism of the `StreamField` itself, but can also be nested or used within other structural block types. Takes a list of `(name, block_definition)` tuples as its first argument:

```
('carousel', blocks.StreamBlock(
    [
        ('image', ImageChooserBlock()),
        ('quotation', blocks.StructBlock([
            ('text', blocks.TextBlock()),
            ('author', blocks.CharBlock()),
        ])),
        ('video', EmbedBlock()),
    ],
    icon='cogs'
))
```

As with `StructBlock`, the list of sub-blocks can also be provided as a subclass of `StreamBlock`:

```
class CarouselBlock(blocks.StreamBlock):
    image = ImageChooserBlock()
    quotation = blocks.StructBlock([
        ('text', blocks.TextBlock()),
```

```
        ('author', blocks.CharBlock()),
    ])
video = EmbedBlock()

class Meta:
    icon='cogs'
```

Since StreamField accepts an instance of StreamBlock as a parameter, in place of a list of block types, this makes it possible to re-use a common set of block types without repeating definitions:

```
class HomePage(Page):
    carousel = StreamField(CarouselBlock())
```

### Example: PersonBlock

This example demonstrates how the basic block types introduced above can be combined into a more complex block type based on StructBlock:

```
from wagtail.wagtailcore import blocks

class PersonBlock(blocks.StructBlock):
    name = blocks.CharBlock()
    height = blocks.DecimalBlock()
    age = blocks.IntegerBlock()
    email = blocks.EmailBlock()

    class Meta:
        template = 'blocks/person_block.html'
```

### Template rendering

StreamField provides an HTML representation for the stream content as a whole, as well as for each individual block. To include this HTML into your page, use the `{% include_block %}` tag:

```
{% load wagtailcore_tags %}

{% include_block page.body %}
```

In the default rendering, each block of the stream is wrapped in a `<div class="block-my_block_name">` element (where `my_block_name` is the block name given in the StreamField definition). If you wish to provide your own HTML markup, you can instead iterate over the field's value, and invoke `{% include_block %}` on each block in turn:

```
{% load wagtailcore_tags %}

<article>
    {% for block in page.body %}
        <section>{% include_block block %}</section>
    {% endfor %}
</article>
```

For more control over the rendering of specific block types, each block object provides `block_type` and `value` properties:

```
{% load wagtailcore_tags %}
```

```
<article>
    {%- for block in page.body %}
        {%- if block.block_type == 'heading' %}
            <h1>{{ block.value }}</h1>
        {%- else %}
            <section class="block-{{ block.block_type }}">
                {%- include_block block %}
            </section>
        {%- endif %}
    {%- endfor %}
</article>
```

By default, each block is rendered using simple, minimal HTML markup, or no markup at all. For example, a CharBlock value is rendered as plain text, while a ListBlock outputs its child blocks in a `<ul>` wrapper. To override this with your own custom HTML rendering, you can pass a `template` argument to the block, giving the filename of a template file to be rendered. This is particularly useful for custom block types derived from StructBlock:

```
('person', blocks.StructBlock(
    [
        ('first_name', blocks.CharBlock(required=True)),
        ('surname', blocks.CharBlock(required=True)),
        ('photo', ImageChooserBlock()),
        ('biography', blocks.RichTextBlock()),
    ],
    template='myapp/blocks/person.html',
    icon='user'
))
```

Or, when defined as a subclass of StructBlock:

```
class PersonBlock(blocks.StructBlock):
    first_name = blocks.CharBlock(required=True)
    surname = blocks.CharBlock(required=True)
    photo = ImageChooserBlock()
    biography = blocks.RichTextBlock()

    class Meta:
        template = 'myapp/blocks/person.html'
        icon = 'user'
```

Within the template, the block value is accessible as the variable `value`:

```
{% load wagtailimages_tags %}

<div class="person">
    {%- image value.photo width-400 %}
    <h2>{{ value.first_name }} {{ value.surname }}</h2>
    {{ value.biography }}
</div>
```

Since `first_name`, `surname`, `photo` and `biography` are defined as blocks in their own right, this could also be written as:

```
{% load wagtailcore_tags wagtailimages_tags %}

<div class="person">
    {%- image value.photo width-400 %}
    <h2>{%- include_block value.first_name %} {%- include_block value.surname %}</h2>
    {%- include_block value.biography %}
```

```
</div>
```

Writing `{% my_block %}` is roughly equivalent to `{% include_block my_block %}`, but the short form is more restrictive, as it does not pass variables from the calling template such as `request` or `page`; for this reason, it is recommended that you only use it for simple values that do not render HTML of their own. For example, if our `PersonBlock` used the template:

```
{% load wagtailimages_tags %}



{% image value.photo width=400 %}
    <h2>{{ value.first_name }} {{ value.surname }}</h2>

    {% if request.user.is_authenticated %}
        <a href="#">Contact this person</a>
    {% endif %}

    {{ value.biography }}


```

then the `request.user.is_authenticated` test would not work correctly when rendering the block through a `{% ... %}` tag:

```
{# Incorrect: #}

{% for block in page.body %}
    {% if block.block_type == 'person' %}
        <div>
            {{ block }}
        </div>
    {% endif %}
{% endfor %}

{# Correct: #}

{% for block in page.body %}
    {% if block.block_type == 'person' %}
        <div>
            {% include_block block %}
        </div>
    {% endif %}
{% endfor %}
```

Like Django's `{% include %}` tag, `{% include_block %}` also allows passing additional variables to the included template, through the syntax `{% include_block my_block with foo="bar" %}`:

```
{# In page template: #

{% for block in page.body %}
    {% if block.block_type == 'person' %}
        {% include_block block with classname="important" %}
    {% endif %}
{% endfor %}

{# In PersonBlock template: #



...

}
```

The syntax `{% include_block my_block with foo="bar" only %}` is also supported, to specify that no variables from the parent template other than `foo` will be passed to the child template. As well as passing variables from the parent template, block subclasses can pass additional template variables of their own by overriding the `get_context` method:

```
import datetime

class EventBlock(blocks.StructBlock):
    title = blocks.CharBlock(required=True)
    date = blocks.DateBlock(required=True)

    def get_context(self, value):
        context = super(EventBlock, self).get_context(value)
        context['is_happening_today'] = (value['date'] == datetime.date.today())
        return context

    class Meta:
        template = 'myapp/blocks/event.html'
```

In this example, the variable `is_happening_today` will be made available within the block template.

## BoundBlocks and values

All block types, not just `StructBlock`, accept a `template` parameter to determine how they will be rendered on a page. However, for blocks that handle basic Python data types, such as `CharBlock` and `IntegerField`, there are some limitations on where the template will take effect, since those built-in types (`str`, `int` and so on) cannot be ‘taught’ about their template rendering. As an example of this, consider the following block definition:

```
class HeadingBlock(blocks.CharBlock):
    class Meta:
        template = 'blocks/heading.html'
```

where `blocks/heading.html` consists of:

```
<h1>{{ value }}</h1>
```

This gives us a block that behaves as an ordinary text field, but wraps its output in `<h1>` tags whenever it is rendered:

```
class BlogPage(Page):
    body = StreamField([
        # ...
        ('heading', HeadingBlock()),
        # ...
    ])

    {% load wagtailcore_tags %}

    {% for block in page.body %}
        {% if block.block_type == 'heading' %}
            {% include_block block %}  {# This block will output its own <h1>...</h1> tags. #}
        {% endif %}
    {% endfor %}
```

This kind of arrangement - a value that supposedly represents a plain text string, but has its own custom HTML representation when output on a template - would normally be a very messy thing to achieve in Python, but it works here because the items you get when iterating over a `StreamField` are not actually the ‘native’ values of the blocks. Instead, each item is returned as an instance of `BoundBlock` - an object that represents the pairing of a value and its block definition. By keeping track of the block definition, a `BoundBlock` always knows which template to render. To

get to the underlying value - in this case, the text content of the heading - you would need to access `block.value`. Indeed, if you were to output `{% include_block block.value %}` on the page, you would find that it renders as plain text, without the `<h1>` tags.

(More precisely, the items returned when iterating over a StreamField are instances of a class `StreamChild`, which provides the `block_type` property as well as `value`.)

Experienced Django developers may find it helpful to compare this to the `BoundField` class in Django's forms framework, which represents the pairing of a form field value with its corresponding form field definition, and therefore knows how to render the value as an HTML form field.

Most of the time, you won't need to worry about these internal details; Wagtail will use the template rendering wherever you would expect it to. However, there are certain cases where the illusion isn't quite complete - namely, when accessing children of a `ListBlock` or `StructBlock`. In these cases, there is no `BoundBlock` wrapper, and so the item cannot be relied upon to know its own template rendering. For example, consider the following setup, where our `HeadingBlock` is a child of a `StructBlock`:

```
class EventBlock(blocks.StructBlock):
    heading = HeadingBlock()
    description = blocks.TextBlock()
    # ...

    class Meta:
        template = 'blocks/event.html'
```

In `blocks/event.html`:

```
{% load wagtailcore_tags %}

<div class="event" {% if value.heading == 'Party!' %}lots-of-balloons{% endif %}>
    {% include_block value.heading %}
    - {% include_block value.description %}
</div>
```

In this case, `value.heading` returns the plain string value rather than a `BoundBlock`; this is necessary because otherwise the comparison in `{% if value.heading == 'Party!' %}` would never succeed. This in turn means that `{% include_block value.heading %}` renders as the plain string, without the `<h1>` tags. To get the HTML rendering, you need to explicitly access the `BoundBlock` instance through `value.bound_blocks.heading`:

```
{% load wagtailcore_tags %}

<div class="event" {% if value.heading == 'Party!' %}lots-of-balloons{% endif %}>
    {% include_block value.bound_blocks.heading %}
    - {% include_block value.description %}
</div>
```

In practice, it would probably be more natural and readable to make the `<h1>` tag explicit in the `EventBlock`'s template:

```
{% load wagtailcore_tags %}

<div class="event" {% if value.heading == 'Party!' %}lots-of-balloons{% endif %}>
    <h1>{{ value.heading }}</h1>
    - {% include_block value.description %}
</div>
```

This limitation does not apply to `StructBlock` and `StreamBlock` values as children of a `StructBlock`, because Wagtail implements these as complex objects that know their own template rendering, even when not wrapped in a `BoundBlock`. For example, if a `StructBlock` is nested in another `StructBlock`, as in:

```
class EventBlock(blocks.StructBlock):
    heading = HeadingBlock()
    description = blocks.TextBlock()
    guest_speaker = blocks.StructBlock([
        ('first_name', blocks.CharBlock()),
        ('surname', blocks.CharBlock()),
        ('photo', ImageChooserBlock()),
    ], template='blocks/speaker.html')
```

then `{% include_block value.guest_speaker %}` within the `EventBlock`'s template will pick up the template rendering from `blocks/speaker.html` as intended.

In summary, interactions between `BoundBlocks` and plain values work according to the following rules:

1. When iterating over the value of a `StreamField` or `StreamBlock` (as in `{% for block in page.body %}`), you will get back a sequence of `BoundBlocks`.
2. If you have a `BoundBlock` instance, you can access the plain value as `block.value`.
3. Accessing a child of a `StructBlock` (as in `value.heading`) will return a plain value; to retrieve the `BoundBlock` instead, use `value.bound_blocks.heading`.
4. The value of a `ListBlock` is a plain Python list; iterating over it returns plain child values.
5. `StructBlock` and `StreamBlock` values always know how to render their own templates, even if you only have the plain value rather than the `BoundBlock`.

## Custom editing interfaces for `StructBlock`

To customise the styling of a `StructBlock` as it appears in the page editor, you can specify a `form_classname` attribute (either as a keyword argument to the `StructBlock` constructor, or in a subclass's `Meta`) to override the default value of `struct-block`:

```
class PersonBlock(blocks.StructBlock):
    first_name = blocks.CharBlock(required=True)
    surname = blocks.CharBlock(required=True)
    photo = ImageChooserBlock()
    biography = blocks.RichTextBlock()

    class Meta:
        icon = 'user'
        form_classname = 'person-block struct-block'
```

You can then provide custom CSS for this block, targeted at the specified classname, by using the `insert_editor_css` hook.

For more extensive customisations that require changes to the HTML markup as well, you can override the `form_template` attribute in `Meta` to specify your own template path. The following variables are available on this template:

**children** An `OrderedDict` of `BoundBlocks` for all of the child blocks making up this `StructBlock`; typically your template will call `render_form` on each of these.

**help\_text** The help text for this block, if specified.

**classname** The class name passed as `form_classname` (defaults to `struct-block`).

**block\_definition** The `StructBlock` instance that defines this block.

**prefix** The prefix used on form fields for this block instance, guaranteed to be unique across the form.

To add additional variables, you can override the block's `get_form_context` method:

```
class PersonBlock(blocks.StructBlock):
    first_name = blocks.CharBlock(required=True)
    surname = blocks.CharBlock(required=True)
    photo = ImageChooserBlock()
    biography = blocks.RichTextBlock()

    def get_form_context(self, value, prefix='', errors=None):
        context = super(PersonBlock, self).get_form_context(value, prefix=prefix, errors=errors)
        context['suggested_first_names'] = ['John', 'Paul', 'George', 'Ringo']
        return context

    class Meta:
        icon = 'user'
        form_template = 'myapp/block_forms/person.html'
```

## Custom block types

If you need to implement a custom UI, or handle a datatype that is not provided by Wagtail's built-in block types (and cannot be built up as a structure of existing fields), it is possible to define your own custom block types. For further guidance, refer to the source code of Wagtail's built-in block classes.

For block types that simply wrap an existing Django form field, Wagtail provides an abstract class `wagtail.wagtailcore.blocks.FieldBlock` as a helper. Subclasses just need to set a `field` property that returns the form field object:

```
class IPAddressBlock(FieldBlock):
    def __init__(self, required=True, help_text=None, **kwargs):
        self.field = forms.GenericIPAddressField(required=required, help_text=help_text)
        super(IPAddressBlock, self).__init__(**kwargs)
```

## Migrations

### StreamField definitions within migrations

As with any model field in Django, any changes to a model definition that affect a StreamField will result in a migration file that contains a 'frozen' copy of that field definition. Since a StreamField definition is more complex than a typical model field, there is an increased likelihood of definitions from your project being imported into the migration – which would cause problems later on if those definitions are moved or deleted.

To mitigate this, StructBlock, StreamBlock and ChoiceBlock implement additional logic to ensure that any subclasses of these blocks are deconstructed to plain instances of StructBlock, StreamBlock and ChoiceBlock – in this way, the migrations avoid having any references to your custom class definitions. This is possible because these block types provide a standard pattern for inheritance, and know how to reconstruct the block definition for any subclass that follows that pattern.

If you subclass any other block class, such as `FieldBlock`, you will need to either keep that class definition in place for the lifetime of your project, or implement a `custom deconstruct method` that expresses your block entirely in terms of classes that are guaranteed to remain in place. Similarly, if you customise a StructBlock, StreamBlock or ChoiceBlock subclass to the point where it can no longer be expressed as an instance of the basic block type – for example, if you add extra arguments to the constructor – you will need to provide your own `deconstruct` method.

## Migrating RichTextFields to StreamField

If you change an existing RichTextField to a StreamField, and create and run migrations as normal, the migration will complete with no errors, since both fields use a text column within the database. However, StreamField uses a JSON representation for its data, so the existing text needs to be converted with a data migration in order to become accessible again. For this to work, the StreamField needs to include a RichTextBlock as one of the available block types. The field can then be converted by creating a new migration (`./manage.py makemigrations --empty myapp`) and editing it as follows (in this example, the ‘body’ field of the `demo.BlogPage` model is being converted to a StreamField with a RichTextBlock named `rich_text`):

```
# -*- coding: utf-8 -*-
from __future__ import unicode_literals

from django.db import models, migrations
from wagtail.wagtailcore.richtext import RichText


def convert_to_streamfield(apps, schema_editor):
    BlogPage = apps.get_model("demo", "BlogPage")
    for page in BlogPage.objects.all():
        if page.body.raw_text and not page.body:
            page.body = [('rich_text', RichText(page.body.raw_text))]
        page.save()

def convert_to_richtext(apps, schema_editor):
    BlogPage = apps.get_model("demo", "BlogPage")
    for page in BlogPage.objects.all():
        if page.body.raw_text is None:
            raw_text = ''.join([
                child.value.source for child in page.body
                if child.block_type == 'rich_text'
            ])
            page.body = raw_text
            page.save()

class Migration(migrations.Migration):

    dependencies = [
        # leave the dependency line from the generated migration intact!
        ('demo', '0001_initial'),
    ]

    operations = [
        migrations.RunPython(
            convert_to_streamfield,
            convert_to_richtext,
        ),
    ]
}
```

## Advanced topics

### Images

## Animated GIF support

Pillow, Wagtail's default image library, doesn't support animated GIFs.

To get animated GIF support, you will have to install [Wand](#). Wand is a binding to ImageMagick so make sure that has been installed as well.

When installed, Wagtail will automatically use Wand for resizing GIF files but continue to resize other images with Pillow.

## Custom image models

The `Image` model can be customised, allowing additional fields to be added to images.

To do this, you need to add two models to your project:

- The image model itself that inherits from `wagtail.wagtailimages.models.AbstractImage`. This is where you would add your additional fields
- The renditions model that inherits from `wagtail.wagtailimages.models.AbstractRendition`. This is used to store renditions for the new model.

Here's an example:

```
# models.py
from django.db import models
from django.db.models.signals import post_delete
from django.dispatch import receiver

from wagtail.wagtailimages.models import Image, AbstractImage, AbstractRendition


class CustomImage(AbstractImage):
    # Add any extra fields to image here

    # eg. To add a caption field:
    # caption = models.CharField(max_length=255, blank=True)

    admin_form_fields = Image.admin_form_fields + (
        # Then add the field names here to make them appear in the form:
        # 'caption',
    )


class CustomRendition(AbstractRendition):
    image = models.ForeignKey(CustomImage, related_name='renditions')

    class Meta:
        unique_together = (
            ('image', 'filter', 'focal_point_key'),
        )

    # Delete the source image file when an image is deleted
    @receiver(post_delete, sender=CustomImage)
    def image_delete(sender, instance, **kwargs):
        instance.file.delete(False)
```

```
# Delete the rendition image file when a rendition is deleted
@receiver(post_delete, sender=CustomRendition)
def rendition_delete(sender, instance, **kwargs):
    instance.file.delete(False)
```

**Note:** Fields defined on a custom image model must either be set as non-required (`blank=True`), or specify a default value - this is because uploading the image and entering custom data happen as two separate actions, and Wagtail needs to be able to create an image record immediately on upload.

**Note:** If you are using image feature detection, follow these instructions to enable it on your custom image model: [Feature detection and custom image models](#)

Then set the `WAGTAILIMAGES_IMAGE_MODEL` setting to point to it:

```
WAGTAILIMAGES_IMAGE_MODEL = 'images.CustomImage'
```

### Migrating from the builtin image model

When changing an existing site to use a custom image model. No images will be copied to the new model automatically. Copying old images to the new model would need to be done manually with a [data migration](#). Any templates that reference the builtin image model will still continue to work as before but would need to be updated in order to see any new images.

## Feature Detection

Wagtail has the ability to automatically detect faces and features inside your images and crop the images to those features.

Feature detection uses OpenCV to detect faces/features in an image when the image is uploaded. The detected features stored internally as a focal point in the `focal_point_{x, y, width, height}` fields on the `Image` model. These fields are used by the `fill` image filter when an image is rendered in a template to crop the image.

### Setup

Feature detection requires OpenCV which can be a bit tricky to install as it's not currently pip-installable.

**Installing OpenCV on Debian/Ubuntu** Debian and ubuntu provide an apt-get package called `python-opencv`:

```
sudo apt-get install python-opencv python-numpy
```

This will install PyOpenCV into your site packages. If you are using a virtual environment, you need to make sure site packages are enabled or Wagtail will not be able to import PyOpenCV.

**Enabling site packages in the virtual environment** If you are not using a virtual envionment, you can skip this step.

Enabling site packages is different depending on whether you are using pyvenv (Python 3.3+ only) or virtualenv to manage your virtual environment.

**pyvenv** Go into your pyvenv directory and open the `pyvenv.cfg` file then set `include-system-site-packages` to true.

**virtualenv** Go into your virtualenv directory and delete a file called `lib/python-x.x/no-global-site-packages.txt`.

**Testing the OpenCV installation** You can test that OpenCV can be seen by Wagtail by opening up a python shell (with your virtual environment active) and typing:

```
import cv
```

If you don't see an `ImportError`, it worked. (If you see the error `libdc1394 error: Failed to initialize libdc1394`, this is harmless and can be ignored.)

**Switching on feature detection in Wagtail** Once OpenCV is installed, you need to set the `WAGTAILIMAGES_FEATURE_DETECTION_ENABLED` setting to `True`:

```
# settings.py

WAGTAILIMAGES_FEATURE_DETECTION_ENABLED = True
```

**Manually running feature detection** Feature detection runs when new images are uploaded in to Wagtail. If you already have images in your Wagtail site and would like to run feature detection on them, you will have to run it manually.

You can manually run feature detection on all images by running the following code in the python shell:

```
from wagtail.wagtailimages.models import Image

for image in Image.objects.all():
    if not image.has_focal_point():
        image.set_focal_point(image.get_suggested_focal_point())
        image.save()
```

**Feature detection and custom image models** When using a [Custom image models](#), you need to add a signal handler to the model to trigger feature detection whenever a new image is uploaded:

```
# Do feature detection when a user saves an image without a focal point
@receiver(pre_save, sender=CustomImage)
def image_feature_detection(sender, instance, **kwargs):
    # Make sure the image doesn't already have a focal point
    if not instance.has_focal_point():
        # Set the focal point
        instance.set_focal_point(instance.get_suggested_focal_point())
```

---

**Note:** This example will always run feature detection regardless of whether the `WAGTAILIMAGES_FEATURE_DETECTION_ENABLED` setting is set.

Add a check for this setting if you still want it to have effect.

---

## Dynamic image serve view

Wagtail provides a view for dynamically generating renditions of images. It can be called by an external system (eg a blog or mobile app) or used internally as an alternative to Wagtail's `{% image %}` tag.

The view takes an image id, filter spec and security signature in the URL. If these parameters are valid, it serves an image file matching that criteria.

Like the `{% image %}` tag, the rendition is generated on the first call and subsequent calls are served from a cache.

### Setup

Add an entry for the view into your URLs configuration:

```
from wagtail.wagtailimages.views.serve import ServeView

urlpatterns = [
    ...
    url(r'^images/([^/]*)/(\d+)/([^/]*)/[^/]*$', ServeView.as_view(), name='wagtailimages_serve')
]
```

### Usage

**Image URL generator UI** When the dynamic serve view is enabled, an image URL generator in the admin interface becomes available automatically. This can be accessed through the edit page of any image by clicking the “URL generator” button on the right hand side.

This interface allows editors to generate URLs to cropped versions of the image.

**Generating dynamic image URLs in Python** Dynamic image URLs can also be generated using Python code and served to a client over an API or used directly in the template.

One advantage of using dynamic image URLs in the template is that they do not block the initial response while rendering like the `{% image %}` tag does.

```
from django.core.urlresolvers import reverse
from wagtail.wagtailimages.views.serve import generate_signature

def generate_image_url(image, filter_spec):
    signature = generate_signature(image.id, filter_spec)
    url = reverse('wagtailimages_serve', args=(signature, image.id, filter_spec))

    # Append image's original filename to the URL (optional)
    url += image.file.name[len('original_images/'):]

    return url
```

And here's an example of this being used in a view:

```
def display_image(request, image_id):
    image = get_object_or_404(Image, id=image_id)

    return render(request, 'display_image.html', {
        'image_url': generate_image_url(image, 'fill-100x100')
    })
```

Image operations can be chained by joining them with a | character:

```
return render(request, 'display_image.html', {
    'image_url': generate_image_url(image, 'fill-100x100|jpegquality-40')
})
```

### Advanced configuration

**Making the view redirect instead of serve** By default, the view will serve the image file directly. This behaviour can be changed to a 301 redirect instead which may be useful if you host your images externally.

To enable this, pass `action='redirect'` into the `ServeView.as_view()` method in your urls configuration:

```
from wagtail.wagtailimages.views.serve import ServeView

urlpatterns = [
    ...
    url(r'^images/([^/]*)/(\d+)/([^/]*)/[^\.]*$',
        ServeView.as_view(action='redirect'), name='wagtailimages_serve')
]
```

**Integration with django-sendfile** `django-sendfile` offloads the job of transferring the image data to the web server instead of serving it directly from the Django application. This could greatly reduce server load in situations where your site has many images being downloaded but you're unable to use a [Caching proxy](#) or a CDN.

You firstly need to install and configure `django-sendfile` and configure your web server to use it. If you haven't done this already, please refer to the [installation docs](#).

To serve images with `django-sendfile`, you can use the `SendFileView` class. This view can be used out of the box:

```
from wagtail.wagtailimages.views.serve import SendFileView

urlpatterns = [
    ...
    url(r'^images/([^/]*)/(\d+)/([^/]*)/[^\.]*$',
        SendFileView.as_view(), name='wagtailimages_sendfile')
]
```

You can customise it to override the backend defined in the `SENDFILE_BACKEND` setting:

```
from wagtail.wagtailimages.views.serve import SendFileView
from project.sendfile_backends import MyCustomBackend

class MySendFileView(SendFileView):
    backend = MyCustomBackend
```

You can also customise it to serve private files. For example, if the only need is to be authenticated (e.g. for Django  $\geq 1.9$ ):

```
from django.contrib.auth.mixins import LoginRequiredMixin
from wagtail.wagtailimages.views.serve import SendFileView

class PrivateSendFileView(LoginRequiredMixin, SendFileView):
    raise_exception = True
```

## Configuring Django for Wagtail

To install Wagtail completely from scratch, create a new Django project and an app within that project. For instructions on these tasks, see [Writing your first Django app](#). Your project directory will look like the following:

```
myproject/
    myproject/
        __init__.py
        settings.py
        urls.py
        wsgi.py
    myapp/
        __init__.py
        models.py
        tests.py
        admin.py
        views.py
    manage.py
```

From your app directory, you can safely remove `admin.py` and `views.py`, since Wagtail will provide this functionality for your models. Configuring Django to load Wagtail involves adding modules and variables to `settings.py` and URL configuration to `urls.py`. For a more complete view of what's defined in these files, see [Django Settings](#) and [Django URL Dispatcher](#).

What follows is a settings reference which skips many boilerplate Django settings. If you just want to get your Wagtail install up quickly without fussing with settings at the moment, see [Ready to Use Example Configuration Files](#).

### Middleware (`settings.py`)

```
MIDDLEWARE_CLASSES = [
    'django.contrib.sessions.middleware.SessionMiddleware',
    'django.middleware.common.CommonMiddleware',
    'django.middleware.csrf.CsrfViewMiddleware',
    'django.contrib.auth.middleware.AuthenticationMiddleware',
    'django.contrib.auth.middleware.SessionAuthenticationMiddleware',
    'django.contrib.messages.middleware.MessageMiddleware',
    'django.middleware.clickjacking.XFrameOptionsMiddleware',
    'django.middleware.security.SecurityMiddleware',

    'wagtail.wagtailcore.middleware.SiteMiddleware',
    'wagtail.wagtailredirects.middleware.RedirectMiddleware',
]
```

Wagtail requires several common Django middleware modules to work and cover basic security. Wagtail provides its own middleware to cover these tasks:

**SiteMiddleware** Wagtail routes pre-defined hosts to pages within the Wagtail tree using this middleware.

**RedirectMiddleware** Wagtail provides a simple interface for adding arbitrary redirects to your site and this module makes it happen.

### Apps (`settings.py`)

```
INSTALLED_APPS = [
    'myapp', # your own app
```

```
'wagtail.wagtailforms',
'wagtail.wagtailredirects',
'wagtail.wagtailembeds',
'wagtail.wagtailsites',
'wagtail.wagtailusers',
'wagtail.wagtailsnippets',
'wagtail.wagtaildocs',
'wagtail.wagtailimages',
'wagtail.wagtailsearch',
'wagtail.wagtailadmin',
'wagtail.wagtailcore',

'taggit',
'modelcluster',

'django.contrib.auth',
'django.contrib.contenttypes',
'django.contrib.sessions',
'django.contrib.messages',
'django.contrib.staticfiles',
]
```

Wagtail requires several Django app modules, third-party apps, and defines several apps of its own. Wagtail was built to be modular, so many Wagtail apps can be omitted to suit your needs. Your own app (here `myapp`) is where you define your models, templates, static assets, template tags, and other custom functionality for your site.

### Wagtail Apps

**wagtailcore** The core functionality of Wagtail, such as the `Page` class, the Wagtail tree, and model fields.

**wagtailadmin** The administration interface for Wagtail, including page edit handlers.

**wagtaildocs** The Wagtail document content type.

**wagtailsnippets** Editing interface for non-Page models and objects. See [Snippets](#).

**wagtailusers** User editing interface.

**wagtailimages** The Wagtail image content type.

**wagtailembeds** Module governing oEmbed and Embedly content in Wagtail rich text fields. See [Inserting videos into body content](#).

**wagtailsearch** Search framework for Page content. See [search](#).

**wagtailredirects** Admin interface for creating arbitrary redirects on your site.

**wagtailforms** Models for creating forms on your pages and viewing submissions. See [Form builder](#).

### Third-Party Apps

**taggit** Tagging framework for Django. This is used internally within Wagtail for image and document tagging and is available for your own models as well. See [Tagging](#) for a Wagtail model recipe or the [Taggit Documentation](#).

**modelcluster** Extension of Django ForeignKey relation functionality, which is used in Wagtail pages for on-the-fly related object creation. For more information, see [Inline Panels and Model Clusters](#) or the [django-modelcluster](#) github project page.

## Settings Variables (`settings.py`)

Wagtail makes use of the following settings, in addition to Django's core settings:

### Site Name

```
WAGTAIL_SITE_NAME = 'Stark Industries Skunkworks'
```

This is the human-readable name of your Wagtail install which welcomes users upon login to the Wagtail admin.

### Append Slash

```
# Don't add a trailing slash to Wagtail-served URLs
WAGTAIL_APPEND_SLASH = False
```

Similar to Django's APPEND\_SLASH, this setting controls how Wagtail will handle requests that don't end in a trailing slash.

When WAGTAIL\_APPEND\_SLASH is True (default), requests to Wagtail pages which omit a trailing slash will be redirected by Django's `CommonMiddleware` to a URL with a trailing slash.

When WAGTAIL\_APPEND\_SLASH is False, requests to Wagtail pages will be served both with and without trailing slashes. Page links generated by Wagtail, however, will not include trailing slashes.

---

**Note:** If you use the False setting, keep in mind that serving your pages both with and without slashes may affect search engines' ability to index your site. See this [Google Webmaster Blog post](#) for more details.

---

### Search

```
WAGTAILSEARCH_BACKENDS = {
    'default': {
        'BACKEND': 'wagtail.wagtailsearch.backends.elasticsearch2',
        'INDEX': 'myapp'
    }
}
```

Define a search backend. For a full explanation, see [Backends](#).

```
WAGTAILSEARCH_RESULTS_TEMPLATE = 'myapp/search_results.html'
WAGTAILSEARCH_RESULTS_TEMPLATE_AJAX = 'myapp/includes/search_listing.html'
```

Override the templates used by the search front-end views.

```
WAGTAILSEARCH_HITS_MAX_AGE = 14
```

Set the number of days (default 7) that search query logs are kept for; these are used to identify popular search terms for [promoted search results](#). Queries older than this will be removed by the `search_garbage_collect` command.

### Embeds

Wagtail uses the oEmbed standard with a large but not comprehensive number of “providers” (Youtube, Vimeo, etc.). You can also use a different embed backend by providing an EmbedKey or replacing the embed backend by writing

your own embed finder function.

```
WAGTAILEMBEDS_EMBED_FINDER = 'myapp.embeds.my_embed_finder_function'
```

Use a custom embed finder function, which takes a URL and returns a dict with metadata and embeddable HTML. Refer to the `wagtail.wagtailembeds.embeds` module source for more information and examples.

```
# not a working key, get your own!
WAGTAILEMBEDS_EMBEDLY_KEY = '253e433d59dc4d2xa266e9e0de0cb830'
```

Providing an API key for the Embedly service will use that as a embed backend, with a more extensive list of providers, as well as analytics and other features. For more information, see [Embedly](#).

To use Embedly, you must also install their Python module:

```
pip install embedly
```

## Images

```
WAGTAILIMAGES_IMAGE_MODEL = 'myapp.MyImage'
```

This setting lets you provide your own image model for use in Wagtail, which might extend the built-in `AbstractImage` class or replace it entirely.

## Maximum Upload size for Images

```
WAGTAILIMAGES_MAX_UPLOAD_SIZE = 20 * 1024 * 1024 # i.e. 20MB
```

This setting lets you override the maximum upload size for images (in bytes). If omitted, Wagtail will fall back to using its 10MB default value.

## Password Management

```
WAGTAIL_PASSWORD_MANAGEMENT_ENABLED = True
```

This specifies whether users are allowed to change their passwords (enabled by default).

```
WAGTAIL_PASSWORD_RESET_ENABLED = True
```

This specifies whether users are allowed to reset their passwords. Defaults to the same as `WAGTAIL_PASSWORD_MANAGEMENT_ENABLED`.

## Email Notifications

```
WAGTAILADMIN_NOTIFICATION_FROM_EMAIL = 'wagtail@myhost.io'
```

Wagtail sends email notifications when content is submitted for moderation, and when the content is accepted or rejected. This setting lets you pick which email address these automatic notifications will come from. If omitted, Django will fall back to using the `DEFAULT_FROM_EMAIL` variable if set, and `webmaster@localhost` if not.

## Email Notifications format

```
WAGTAILADMIN_NOTIFICATION_USE_HTML = True
```

Notification emails are sent in *text/plain* by default, change this to use HTML formatting.

## Wagtail update notifications

```
WAGTAIL_ENABLE_UPDATE_CHECK = True
```

For admins only, Wagtail performs a check on the dashboard to see if newer releases are available. This also provides the Wagtail team with the hostname of your Wagtail site. If you'd rather not receive update notifications, or if you'd like your site to remain unknown, you can disable it with this setting.

## Private Pages

```
PASSWORD_REQUIRED_TEMPLATE = 'myapp/password_required.html'
```

This is the path to the Django template which will be used to display the “password required” form when a user accesses a private page. For more details, see the [Private pages](#) documentation.

## Case-Insensitive Tags

```
TAGGIT_CASE_INSENSITIVE = True
```

Tags are case-sensitive by default ('music' and 'Music' are treated as distinct tags). In many cases the reverse behaviour is preferable.

## Unicode Page Slugs

```
WAGTAIL_ALLOW_UNICODE_SLUGS = True
```

By default, page slugs can contain any alphanumeric characters, including non-Latin alphabets (except on Django 1.8, where only ASCII characters are supported). Set this to False to limit slugs to ASCII characters.

## Custom User Edit Forms

See [Custom user models](#).

```
WAGTAIL_USER_EDIT_FORM = 'users.forms.CustomUserEditForm'
```

Allows the default `UserEditForm` class to be overridden with a custom form when a custom user model is being used and extra fields are required in the user edit form.

```
WAGTAIL_USER_CREATION_FORM = 'users.forms.CustomUserCreationForm'
```

Allows the default `UserCreationForm` class to be overridden with a custom form when a custom user model is being used and extra fields are required in the user creation form.

```
WAGTAIL_USER_CUSTOM_FIELDS = ['country']
```

A list of the extra custom fields to be appended to the default list.

### Usage for images, documents and snippets

```
WAGTAIL_USAGE_COUNT_ENABLED = True
```

When enabled Wagtail shows where a particular image, document or snippet is being used on your site (disabled by default). A link will appear on the edit page showing you which pages they have been used on.

---

**Note:** The usage count only applies to direct (database) references. Using documents, images and snippets within StreamFields or rich text fields will not be taken into account.

---

### URL Patterns

```
from django.contrib import admin

from wagtail.wagtailcore import urls as wagtail_urls
from wagtail.wagtailadmin import urls as wagtailadmin_urls
from wagtail.wagtailedocs import urls as wagtailedocs_urls
from wagtail.wagtailsearch import urls as wagtailsearch_urls

urlpatterns = [
    url(r'^django-admin/', include(admin.site.urls)),

    url(r'^admin/', include(wagtailadmin_urls)),
    url(r'^search/', include(wagtailsearch_urls)),
    url(r'^documents/', include(wagtailedocs_urls)),

    # Optional URL for including your own vanilla Django urls/views
    url(r'', include('myapp.urls')),

    # For anything not caught by a more specific rule above, hand over to
    # Wagtail's serving mechanism
    url(r'', include(wagtail_urls)),
]
```

This block of code for your project's `urls.py` does a few things:

- Load the vanilla Django admin interface to `/django-admin/`
- Load the Wagtail admin and its various apps
- Dispatch any vanilla Django apps you're using other than Wagtail which require their own URL configuration (this is optional, since Wagtail might be all you need)
- Lets Wagtail handle any further URL dispatching.

That's not everything you might want to include in your project's URL configuration, but it's what's necessary for Wagtail to flourish.

### Ready to Use Example Configuration Files

These two files should reside in your project directory (`myproject/myproject/`).

**settings.py**

```

import os

PROJECT_DIR = os.path.dirname(os.path.dirname(os.path.abspath(__file__)))
BASE_DIR = os.path.dirname(PROJECT_DIR)

DEBUG = True

# Application definition

INSTALLED_APPS = [
    'myapp',

    'wagtail.wagtailforms',
    'wagtail.wagtailredirects',
    'wagtail.wagtailembeds',
    'wagtail.wagtailsites',
    'wagtail.wagtailusers',
    'wagtail.wagtailsnippets',
    'wagtail.wagtaildocs',
    'wagtail.wagtailimages',
    'wagtail.wagtailsearch',
    'wagtail.wagtailadmin',
    'wagtail.wagtailcore',

    'taggit',
    'modelcluster',

    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
]

MIDDLEWARE_CLASSES = [
    'django.contrib.sessions.middleware.SessionMiddleware',
    'django.middleware.common.CommonMiddleware',
    'django.middleware.csrf.CsrfViewMiddleware',
    'django.contrib.auth.middleware.AuthenticationMiddleware',
    'django.contrib.auth.middleware.SessionAuthenticationMiddleware',
    'django.contrib.messages.middleware.MessageMiddleware',
    'django.middleware.clickjacking.XFrameOptionsMiddleware',
    'django.middleware.security.SecurityMiddleware',

    'wagtail.wagtailcore.middleware.SiteMiddleware',
    'wagtail.wagtailredirects.middleware.RedirectMiddleware',
]

ROOT_URLCONF = 'myproject.urls'

TEMPLATES = [
    {
        'BACKEND': 'django.template.backends.django.DjangoTemplates',
        'DIRS': [
            os.path.join(PROJECT_DIR, 'templates'),
        ],
        'OPTIONS': {
            'context_processors': [
                'django.template.context_processors.debug',
                'django.template.context_processors.request',
                'django.contrib.auth.context_processors.auth',
                'django.contrib.messages.context_processors.messages',
            ],
            'loaders': [
                'django.template.loaders.filesystem.Loader',
                'django.template.loaders.app_directories.Loader',
            ],
        },
    },
]

```

```
[],
'APP_DIRS': True,
'OPTIONS': {
    'context_processors': [
        'django.template.context_processors.debug',
        'django.template.context_processors.request',
        'django.contrib.auth.context_processors.auth',
        'django.contrib.messages.context_processors.messages',
    ],
},
},
],
]

WSGI_APPLICATION = 'wagtailedemo.wsgi.application'

# Database

DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.postgresql_psycopg2',
        'NAME': 'myprojectdb',
        'USER': 'postgres',
        'PASSWORD': '',
        'HOST': '', # Set to empty string for localhost.
        'PORT': '', # Set to empty string for default.
        'CONN_MAX_AGE': 600, # number of seconds database connections should persist for
    }
}

# Internationalization

LANGUAGE_CODE = 'en-us'
TIME_ZONE = 'UTC'
USE_I18N = True
USE_L10N = True
USE_TZ = True

# Static files (CSS, JavaScript, Images)

STATICFILES_FINDERS = [
    'django.contrib.staticfiles.finders.FileSystemFinder',
    'django.contrib.staticfiles.finders.AppDirectoriesFinder',
]

STATICFILES_DIRS = [
    os.path.join(PROJECT_DIR, 'static'),
]

STATIC_ROOT = os.path.join(BASE_DIR, 'static')
STATIC_URL = '/static/'

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

ADMINS = [
    # ('Your Name', 'your_email@example.com'),
```

```

]

MANAGERS = ADMINS

# Default to dummy email backend. Configure dev/production/local backend
# as per https://docs.djangoproject.com/en/dev/topics/email/#email-backends
EMAIL_BACKEND = 'django.core.mail.backends.dummy.EmailBackend'

# Hosts/domain names that are valid for this site; required if DEBUG is False
ALLOWED_HOSTS = []

# Make this unique, and don't share it with anybody.
SECRET_KEY = 'change-me'

EMAIL SUBJECT PREFIX = '[Wagtail] '

INTERNAL_IPS = ('127.0.0.1', '10.0.2.2')

# A sample logging configuration. The only tangible logging
# performed by this configuration is to send an email to
# the site admins on every HTTP 500 error when DEBUG=False.
# See http://docs.djangoproject.com/en/dev/topics/logging for
# more details on how to customize your logging configuration.
LOGGING = {
    'version': 1,
    'disable_existing_loggers': False,
    'filters': {
        'require_debug_false': {
            '()': 'django.utils.log.RequireDebugFalse'
        }
    },
    'handlers': {
        'mail_admins': {
            'level': 'ERROR',
            'filters': ['require_debug_false'],
            'class': 'django.utils.log.AdminEmailHandler'
        }
    },
    'loggers': {
        'django.request': {
            'handlers': ['mail_admins'],
            'level': 'ERROR',
            'propagate': True,
        },
    },
}

# WAGTAIL SETTINGS

# This is the human-readable name of your Wagtail install
# which welcomes users upon login to the Wagtail admin.
WAGTAIL_SITE_NAME = 'My Project'

# Override the search results template for wagtailsearch
# WAGTAILSEARCH_RESULTS_TEMPLATE = 'myapp/search_results.html'
# WAGTAILSEARCH_RESULTS_TEMPLATE_AJAX = 'myapp/includes/search_listing.html'

# Replace the search backend

```

```
#WAGTAILSEARCH_BACKENDS = {
#    'default': {
#        'BACKEND': 'wagtail.wagtailsearch.backends.elasticsearch2',
#        'INDEX': 'myapp'
#    }
#}

# Wagtail email notifications from address
# WAGTAILADMIN_NOTIFICATION_FROM_EMAIL = 'wagtail@myhost.io'

# Wagtail email notification format
# WAGTAILADMIN_NOTIFICATION_USE_HTML = True

# If you want to use Embedly for embeds, supply a key
# (this key doesn't work, get your own!)
# WAGTAILEMBEDS_EMBEDLY_KEY = '253e433d59dc4d2xa266e9e0de0cb830'

# Reverse the default case-sensitive handling of tags
TAGGIT_CASE_INSENSITIVE = True
```

### urls.py

```
from django.conf.urls import patterns, include, url
from django.conf.urls.static import static
from django.views.generic.base import RedirectView
from django.contrib import admin
from django.conf import settings
import os.path

from wagtail.wagtailcore import urls as wagtail_urls
from wagtail.wagtailadmin import urls as wagtailadmin_urls
from wagtail.wagtailedocs import urls as wagtailedocs_urls
from wagtail.wagtailsearch import urls as wagtailsearch_urls

urlpatterns = patterns('',
    url(r'^django-admin/', include(admin.site.urls)),

    url(r'^admin/', include(wagtailadmin_urls)),
    url(r'^search/', include(wagtailsearch_urls)),
    url(r'^documents/', include(wagtailedocs_urls)),

    # For anything not caught by a more specific rule above, hand over to
    # Wagtail's serving mechanism
    url(r'', include(wagtail_urls)),
)

if settings.DEBUG:
    from django.contrib.staticfiles.urls import staticfiles_urlpatterns

    urlpatterns += staticfiles_urlpatterns() # tell gunicorn where static files are in dev mode
    urlpatterns += static(settings.MEDIA_URL + 'images/', document_root=os.path.join(settings.MEDIA_ROOT, 'images'))
    urlpatterns += patterns('',
        (r'^favicon\.ico$', RedirectView.as_view(url=settings.STATIC_URL + 'myapp/images/favicon.ico'))
)
```

## Deploying Wagtail

### On your server

Wagtail is straightforward to deploy on modern Linux-based distributions, but see the section on [performance](#) for the non-Python services we recommend.

Our current preferences are for Nginx, Gunicorn and supervisor on Debian, but Wagtail should run with any of the combinations detailed in Django's deployment documentation.

### On Gondor

Gondor specialise in Python hosting. They provide Redis and Elasticsearch, which are two of the services we recommend for high-performance production sites. Gondor have written a comprehensive tutorial on running your Wagtail site on their platform, at [gondor.io/blog/2014/02/14/how-run-wagtail-cms-gondor/](http://gondor.io/blog/2014/02/14/how-run-wagtail-cms-gondor/).

### On Openshift

[OpenShift](#) is Red Hat's Platform-as-a-Service (PaaS) that allows developers to quickly develop, host, and scale applications in a cloud environment. With their Python, PostgreSQL and Elasticsearch cartridges there's all you need to host a Wagtail site. To get quickly up and running you may use the [wagtail-openshift-quickstart](#).

### On other PAAss and IAAs

We know of Wagtail sites running on [Heroku](#), Digital Ocean and elsewhere. If you have successfully installed Wagtail on your platform or infrastructure, please [contribute](#) your notes to this documentation!

## Performance

Wagtail is designed for speed, both in the editor interface and on the front-end, but if you want even better performance or you need to handle very high volumes of traffic, here are some tips on eking out the most from your installation.

### Editor interface

We have tried to minimise external dependencies for a working installation of Wagtail, in order to make it as simple as possible to get going. However, a number of default settings can be configured for better performance:

#### Cache

We recommend [Redis](#) as a fast, persistent cache. Install Redis through your package manager (on Debian or Ubuntu: `sudo apt-get install redis-server`), add `django-redis` to your `requirements.txt`, and enable it as a cache backend:

```
CACHES = {
    'default': {
        'BACKEND': 'django_redis.cache.RedisCache',
        'LOCATION': '127.0.0.1:6379',
        'OPTIONS': {
            'CLIENT_CLASS': 'django_redis.client.DefaultClient',
        }
    }
}
```

```
    }  
}
```

## Search

Wagtail has strong support for [Elasticsearch](#) - both in the editor interface and for users of your site - but can fall back to a database search if Elasticsearch isn't present. Elasticsearch is faster and more powerful than the Django ORM for text search, so we recommend installing it or using a hosted service like [Searchly](#).

Once the Elasticsearch server is installed and running. Install the `elasticsearch` Python module with:

```
pip install elasticsearch
```

then add the following to your settings:

```
WAGTAILSEARCH_BACKENDS = {  
    'default': {  
        'BACKEND': 'wagtail.wagtailsearch.backends.elasticsearch.ElasticSearch',  
        'INDEX': '{{ project_name }}',  
    },  
}
```

Once Elasticsearch is configured, you can index any existing content you may have:

```
./manage.py update_index
```

## Database

Wagtail is tested on SQLite, and should work on other Django-supported database backends, but we recommend PostgreSQL for production use.

## Public users

### Caching proxy

To support high volumes of traffic with excellent response times, we recommend a caching proxy. Both [Varnish](#) and [Squid](#) have been tested in production. Hosted proxies like [Cloudflare](#) should also work well.

Wagtail supports automatic cache invalidation for Varnish/Squid. See [Frontend cache invalidator](#) for more information.

## Internationalisation

This document describes the internationalisation features of Wagtail and how to create multi-lingual sites.

Wagtail uses Django's [Internationalisation framework](#) so most of the steps are the same as other Django projects.

## Contents

- *Internationalisation*
  - *Wagtail admin translations*
  - *Changing the primary language of your Wagtail installation*
  - *Creating sites with multiple languages*
    - \* *Enabling multiple language support*
    - \* *Serving different languages from different URLs*
    - \* *Translating templates*
    - \* *Translating content*
    - \* *Other approaches*

## [Wagtail admin translations](#)

The Wagtail admin backend has been translated into many different languages. You can find a list of currently available translations on Wagtail’s [Transifex page](#). (Note: if you’re using an old version of Wagtail, this page may not accurately reflect what languages you have available).

If your language isn’t listed on that page, you can easily contribute new languages or correct mistakes. Sign up and submit changes to [Transifex](#). Translation updates are typically merged into an official release within one month of being submitted.

## [Changing the primary language of your Wagtail installation](#)

The default language of Wagtail is `en-us` (American English). You can change this by tweaking a couple of Django settings:

- Make sure `USE_I18N` is set to `True`
- Set `LANGUAGE_CODE` to your websites’ primary language

If there is a translation available for your language, the Wagtail admin backend should now be in the language you’ve chosen.

## [Creating sites with multiple languages](#)

You can create sites with multiple language support by leveraging Django’s [translation features](#).

This section of the documentation will show you how to use Django’s translation features with Wagtail and also describe a couple of methods for storing/retrieving translated content using Wagtail pages.

### [Enabling multiple language support](#)

Firstly, make sure the `USE_I18N` Django setting is set to `True`.

To enable multi-language support, add `django.middleware.locale.LocaleMiddleware` to your `MIDDLEWARE_CLASSES`:

```
MIDDLEWARE_CLASSES = (
    ...
    'django.middleware.locale.LocaleMiddleware',
)
```

This middleware class looks at the user's browser language and sets the `language` of the site accordingly.

### Serving different languages from different URLs

Just enabling the multi-language support in Django sometimes may not be enough. By default, Django will serve different languages of the same page with the same URL. This has a couple of drawbacks:

- Users cannot change language without changing their browser settings
- It may not work well with various caching setups (as content varies based on browser settings)

Django's `i18n_patterns` feature, when enabled, prefixes the URLs with the language code (eg `/en/about-us`). Users are forwarded to their preferred version, based on browser language, when they first visit the site.

This feature is enabled through the project's root URL configuration. Just put the views you would like to have this enabled for in an `i18n_patterns` list and append that to the other URL patterns:

```
# mysite/urls.py

from django.conf.urls import include, url
from django.conf.urls.i18n import i18n_patterns
from django.conf import settings
from django.contrib import admin

from wagtail.wagtailadmin import urls as wagtailadmin_urls
from wagtail.wagtailedocs import urls as wagtailedocs_urls
from wagtail.wagtailcore import urls as wagtail_urls


urlpatterns = [
    url(r'^django-admin/', include(admin.site.urls)),

    url(r'^admin/', include(wagtailadmin_urls)),
    url(r'^documents/', include(wagtailedocs_urls)),
]

urlpatterns += i18n_patterns('',
    # These URLs will have /<language_code>/ appended to the beginning

    url(r'^search/$', 'search.views.search', name='search'),

    url(r'', include(wagtail_urls)),
)
```

You can implement switching between languages by changing the part at the beginning of the URL. As each language has its own URL, it also works well with just about any caching setup.

### Translating templates

Static text in templates needs to be marked up in a way that allows Django's `makemessages` command to find and export the strings for translators and also allow them to switch to translated versions on the when the template is being served.

As Wagtail uses Django's templates, inserting this markup and the workflow for exporting and translating the strings is the same as any other Django project.

See: <https://docs.djangoproject.com/en/1.8/topics/i18n/translation/#internationalization-in-template-code>

## Translating content

The most common approach for translating content in Wagtail is to duplicate each translatable text field, providing a separate field for each language.

This section will describe how to implement this method manually but there is a third party module you can use, `wagtail modeltranslation`, which may be quicker if it meets your needs.

### Duplicating the fields in your model

For each field you would like to be translatable, duplicate it for every language you support and suffix it with the language code:

```
class BlogPage(Page):

    title_fr = models.CharField(max_length=255)

    body_en = StreamField(...)
    body_fr = StreamField(...)

    # Language-independent fields don't need to be duplicated
    thumbnail_image = models.ForeignKey('wagtailimages.image', ...)
```

---

**Note:** We only define the French version of the `title` field as Wagtail already provides the English version for us.

---

### Organising the fields in the admin interface

You can either put all the fields with their translations next to each other on the “content” tab or put the translations for other languages on different tabs.

See [Customising the tabbed interface](#) for information on how to add more tabs to the admin interface.

### Accessing the fields from the template

In order for the translations to be shown on the site frontend, the correct field needs to be used in the template based on what language the client has selected.

Having to add language checks every time you display a field in a template, could make your templates very messy. Here’s a little trick that will allow you to implement this while keeping your templates and model code clean.

You can use a snippet like the following to add accessor fields on to your page model. These accessor fields will point at the field that contains the language the user has selected.

Copy this into your project and make sure it’s imported in any `models.py` files that contain a `Page` with translated fields. It will require some modification to support different languages.

```
from django.utils import translation

class TranslatedField(object):
    def __init__(self, en_field, fr_field):
        self.en_field = en_field
        self.fr_field = fr_field

    def __get__(self, instance, owner):
        en = getattr(instance, self.en_field)
        fr = getattr(instance, self.fr_field)

        if translation.get_language() == 'fr':
            return fr
```

```
    else:  
        return en
```

Then, for each translated field, create an instance of `TranslatedField` with a nice name (as this is the name your templates will reference).

For example, here's how we would apply this to the above `BlogPage` model:

```
class BlogPage(Page):  
    ...  
  
    translated_title = TranslatedField(  
        'title',  
        'title_fr',  
    )  
    body = TranslatedField(  
        'body_en',  
        'body_fr',  
    )
```

Finally, in the template, reference the accessors instead of the underlying database fields:

```
{{ page.translated_title }}  
  
{{ page.body }}
```

### Other approaches

**Creating a multilingual site (by duplicating the page tree)** This tutorial will show you a method of creating multilingual sites in Wagtail by duplicating the page tree.

For example:

```
/  
en/  
    about/  
    contact/  
fr/  
    about/  
    contact/
```

**The root page** The root page (/) should detect the browser's language and forward them to the correct language homepage (/en/, /fr/). This page should sit at the site root (where the homepage would normally be).

We must set Django's `LANGUAGES` setting so we don't redirect non English/French users to pages that don't exist.

```
# settings.py  
LANGUAGES = (  
    ('en', _("English")),  
    ('fr', _("French")),  
)  
  
# models.py  
from django.utils import translation  
from django.http import HttpResponseRedirect  
  
from wagtail.wagtailcore.models import Page
```

```
class LanguageRedirectionPage(Page):

    def serve(self, request):
        # This will only return a language that is in the LANGUAGES Django setting
        language = translation.get_language_from_request(request)

        return HttpResponseRedirect(self.url + language + '/')
```

**Linking pages together** It may be useful to link different versions of the same page together to allow the user to easily switch between languages. But we don't want to increase the burden on the editor too much so ideally, editors should only need to link one of the pages to the other versions and the links between the other versions should be created implicitly.

As this behaviour needs to be added to all page types that would be translated, its best to put this behaviour in a mixin.

Here's an example of how this could be implemented (with English as the main language and French/Spanish as alternative languages):

```
from wagtail.wagtailcore.models import Page
from wagtail.wagtailadmin.edit_handlers import MultiFieldPanel, PageChooserPanel


class TranslatablePageMixin(models.Model):
    # One link for each alternative language
    # These should only be used on the main language page (english)
    french_link = models.ForeignKey(Page, null=True, on_delete=models.SET_NULL, blank=True, related_name='french_translations')
    spanish_link = models.ForeignKey(Page, null=True, on_delete=models.SET_NULL, blank=True, related_name='spanish_translations')

    panels = [
        PageChooserPanel('french_link'),
        PageChooserPanel('spanish_link'),
    ]

    def get_language(self):
        """
        This returns the language code for this page.
        """
        # Look through ancestors of this page for its language homepage
        # The language homepage is located at depth 3
        language_homepage = self.get_ancestors(inclusive=True).get(depth=3)

        # The slug of language homepages should always be set to the language code
        return language_homepage.slug

    # Method to find the main language version of this page
    # This works by reversing the above links

    def english_page(self):
        """
        This finds the english version of this page
        """
        language = self.get_language()

        if language == 'en':
            return self
```

```

    elif language == 'fr':
        return type(self).objects.filter(french_link=self).first().specific
    elif language == 'es':
        return type(self).objects.filter(spanish_link=self).first().specific

    # We need a method to find a version of this page for each alternative language.
    # These all work the same way. They firstly find the main version of the page
    # (english), then from there they can just follow the link to the correct page.

def french_page(self):
    """
    This finds the french version of this page
    """
    english_page = self.english_page()

    if english_page and english_page.french_link:
        return english_page.french_link.specific

def spanish_page(self):
    """
    This finds the spanish version of this page
    """
    english_page = self.english_page()

    if english_page and english_page.spanish_link:
        return english_page.spanish_link.specific

class Meta:
    abstract = True

class AboutPage(Page, TranslatablePageMixin):
    ...
    content_panels = [
        ...
        MultiFieldPanel(TranslatablePageMixin.panels, 'Language links')
    ]

class ContactPage(Page, TranslatablePageMixin):
    ...
    content_panels = [
        ...
        MultiFieldPanel(TranslatablePageMixin.panels, 'Language links')
    ]

```

You can make use of these methods in your template by doing:

```

{%
if page.english_page and page.get_language != 'en' %}
<a href="{{ page.english_page.url }}>{{ trans "View in English" }}</a>
{%
endif %}

{%
if page.french_page and page.get_language != 'fr' %}
<a href="{{ page.french_page.url }}>{{ trans "View in French" }}</a>
{%
endif %}

{%
if page.spanish_page and page.get_language != 'es' %}

```

```
<a href="{{ page.spanish_page.url }}>{{ trans "View in Spanish" }}</a>
{%
endif %}
```

## Private pages

Users with publish permission on a page can set it to be private by clicking the ‘Privacy’ control in the top right corner of the page explorer or editing interface, and setting a password. Users visiting this page, or any of its subpages, will be prompted to enter a password before they can view the page.

Private pages work on Wagtail out of the box - the site implementer does not need to do anything to set them up. However, the default “password required” form is only a bare-bones HTML page, and site implementers may wish to replace this with a page customised to their site design.

### Setting up a global “password required” page

By setting `PASSWORD_REQUIRED_TEMPLATE` in your Django settings file, you can specify the path of a template which will be used for all “password required” forms on the site (except for page types that specifically override it - see below):

```
PASSWORD_REQUIRED_TEMPLATE = 'myapp/password_required.html'
```

This template will receive the same set of context variables that the blocked page would pass to its own template via `get_context()` - including `page` to refer to the page object itself - plus the following additional variables (which override any of the page’s own context variables of the same name):

- **form** - A Django form object for the password prompt; this will contain a field named `password` as its only visible field. A number of hidden fields may also be present, so the page must loop over `form.hidden_fields` if not using one of Django’s rendering helpers such as `form.as_p`.
- **action\_url** - The URL that the password form should be submitted to, as a POST request.

A basic template suitable for use as `PASSWORD_REQUIRED_TEMPLATE` might look like this:

```
<!DOCTYPE HTML>
<html>
  <head>
    <title>Password required</title>
  </head>
  <body>
    <h1>Password required</h1>
    <p>You need a password to access this page.</p>
    <form action="{{ action_url }}" method="POST">
      {% csrf_token %}

      {{ form.non_field_errors }}

      <div>
        {{ form.password.errors }}
        {{ form.password.label_tag }}
        {{ form.password }}
      </div>

      {% for field in form.hidden_fields %}
        {{ field }}
      {% endfor %}
      <input type="submit" value="Continue" />
    </form>
```

```
</body>
</html>
```

## Setting a “password required” page for a specific page type

The attribute `password_required_template` can be defined on a page model to use a custom template for the “password required” view, for that page type only. For example, if a site had a page type for displaying embedded videos along with a description, it might choose to use a custom “password required” template that displays the video description as usual, but shows the password form in place of the video embed.

```
class VideoPage(Page):
    ...
    password_required_template = 'video/password_required.html'
```

# Customising Wagtail

## Customising the editing interface

### Customising the tabbed interface

New in version 1.0.

As standard, Wagtail organises panels for pages into three tabs: ‘Content’, ‘Promote’ and ‘Settings’. For snippets Wagtail puts all panels into one page. Depending on the requirements of your site, you may wish to customise this for specific page types or snippets - for example, adding an additional tab for sidebar content. This can be done by specifying an `edit_handler` attribute on the page or snippet model. For example:

```
from wagtail.wagtailadmin.edit_handlers import TabbedInterface, ObjectList

class BlogPage(Page):
    # field definitions omitted

    content_panels = [
        FieldPanel('title', classname="full title"),
        FieldPanel('date'),
        FieldPanel('body', classname="full"),
    ]
    sidebar_content_panels = [
        SnippetChooserPanel('advert'),
        InlinePanel('related_links', label="Related links"),
    ]

    edit_handler = TabbedInterface([
        ObjectList(content_panels, heading='Content'),
        ObjectList(sidebar_content_panels, heading='Sidebar content'),
        ObjectList(Page.promote_panels, heading='Promote'),
        ObjectList(Page.settings_panels, heading='Settings', classname="settings"),
    ])
```

## Rich Text (HTML)

Wagtail provides a general-purpose WYSIWYG editor for creating rich text content (HTML) and embedding media such as images, video, and documents. To include this in your models, use the `RichTextField` function when defining a model field:

```
from wagtail.wagtailcore.fields import RichTextField
from wagtail.wagtailadmin.edit_handlers import FieldPanel

class BookPage(Page):
    book_text = RichTextField()

    content_panels = Page.content_panels + [
        FieldPanel('body', classname="full"),
    ]
```

`RichTextField` inherits from Django's basic `TextField` field, so you can pass any field parameters into `RichTextField` as if using a normal Django field. This field does not need a special panel and can be defined with `FieldPanel`.

However, template output from `RichTextField` is special and need to be filtered to preserve embedded content. See [Rich text \(filter\)](#).

If you're interested in extending the capabilities of the Wagtail WYSIWYG editor (`hallo.js`), See [Extending the WYSIWYG Editor \(hallo.js\)](#).

**Extending the WYSIWYG Editor (`hallo.js`)** To inject JavaScript into the Wagtail page editor, see the [`insert\_editor\_js`](#) hook. Once you have the hook in place and your `hallo.js` plugin loads into the Wagtail page editor, use the following JavaScript to register the plugin with `hallo.js`.

```
registerHalloPlugin(name, opts);
```

`hallo.js` plugin names are prefixed with the "IKS." namespace, but the name you pass into `registerHalloPlugin()` should be without the prefix. `opts` is an object passed into the plugin.

For information on developing custom `hallo.js` plugins, see the project's page: <https://github.com/bergie/hallo>

**Image Formats in the Rich Text Editor** On loading, Wagtail will search for any app with the file `image_formats.py` and execute the contents. This provides a way to customise the formatting options shown to the editor when inserting images in the `RichTextField` editor.

As an example, add a “thumbnail” format:

```
# image_formats.py
from wagtail.wagtailimages.formats import Format, register_image_format

register_image_format(Format('thumbnail', 'Thumbnail', 'richtext-image thumbnail', 'max-120x120'))
```

To begin, import the `Format` class, `register_image_format` function, and optionally `unregister_image_format` function. To register a new `Format`, call the `register_image_format` with the `Format` object as the argument. The `Format` class takes the following constructor arguments:

**name** The unique key used to identify the format. To unregister this format, call `unregister_image_format` with this string as the only argument.

**label** The label used in the chooser form when inserting the image into the `RichTextField`.

**classnames** The string to assign to the `class` attribute of the generated `<img>` tag.

---

**Note:** Any class names you provide must have CSS rules matching them written separately, as part of the front end CSS code. Specifying a `classnames` value of `left` will only ensure that class is output in the generated markup, it won't cause the image to align itself left.

---

**filter\_spec** The string specification to create the image rendition. For more, see the [Using images in templates](#). To unregister, call `unregister_image_format` with the string of the name of the Format as the only argument.

### Customising generated forms

```
class wagtail.wagtailadmin.forms.WagtailAdminModelForm  
class wagtail.wagtailadmin.forms.WagtailAdminPageForm
```

Wagtail automatically generates forms using the panels configured on the model. By default, this form subclasses `WagtailAdminModelForm`, or `WagtailAdminPageForm` for pages. A custom base form class can be configured by setting the `base_form_class` attribute on any model. Custom forms for snippets must subclass `WagtailAdminModelForm`, and custom forms for pages must subclass `WagtailAdminPageForm`.

This can be used to add non-model fields to the form, to automatically generate field content, or to add custom validation logic for your models:

```
from django import forms  
from wagtail.wagtailadmin.edit_handlers import FieldPanel  
from wagtail.wagtailadmin.forms import WagtailAdminPageForm  
from wagtail.wagtailcore.models import Page  
  
class EventPageForm(WagtailAdminPageForm):  
    address = forms.CharField()  
  
    def clean(self):  
        cleaned_data = super(EventPageForm, self).clean()  
  
        # Make sure that the event starts before it ends  
        start_date = cleaned_data['start_date']  
        end_date = cleaned_data['end_date']  
        if start_date and end_date and start_date > end_date:  
            self.add_error('end_date', 'The end date must be after the start date')  
  
    return cleaned_data  
  
def save(self, commit=True):  
    page = super(EventPageForm, self).save(commit=False)  
  
    # Update the duration field from the submitted dates  
    page.duration = (page.end_date - page.start_date).days  
  
    # Fetch the location by geocoding the address  
    page.location = geocoder.get_coordinates(self.cleaned_data['address'])  
  
    if commit:  
        page.save()  
    return page
```

```
class EventPage(Page):
    start_date = models.DateField()
    end_date = models.DateField()
    duration = models.IntegerField()
    location = models.CharField()

    content_panels = [
        FieldPanel('given_name'),
        FieldPanel('family_name'),
        FieldPanel('bio'),
    ]
    base_form_class = EventPageForm
```

Wagtail will generate a new subclass of this form for the model, adding any fields defined in `panels` or `content_panels`. Any fields already defined on the model will not be overridden by these automatically added fields, so the form field for a model field can be overridden by adding it to the custom form.

## Custom branding

In your projects with Wagtail, you may wish to replace elements such as the Wagtail logo within the admin interface with your own branding. This can be done through Django's template inheritance mechanism.

---

**Note:** Using `{% extends %}` in this way on a template you're currently overriding is only supported in Django 1.9 and above. On Django 1.8, you will need to use `django-overextends` instead.

---

You need to create a `templates/wagtailadmin/` folder within one of your apps - this may be an existing one, or a new one created for this purpose, for example, `dashboard`. This app must be registered in `INSTALLED_APPS` before `wagtail.wagtailadmin`:

```
INSTALLED_APPS = (
    # ...

    'dashboard',

    'wagtail.wagtailcore',
    'wagtail.wagtailadmin',

    # ...
)
```

The template blocks that are available to be overridden are as follows:

### `branding_logo`

To replace the default logo, create a template file `dashboard/templates/wagtailadmin/base.html` that overrides the block `branding_logo`:

```
{% extends "wagtailadmin/base.html" %}
{% load staticfiles %}

{% block branding_logo %}
    
{% endblock %}
```

### branding\_favicon

To replace the favicon displayed when viewing admin pages, create a template file dashboard/templates/wagtailadmin/admin\_base.html that overrides the block branding\_favicon:

```
{% extends "wagtailadmin/admin_base.html" %}  
{% load staticfiles %}  
  
{% block branding_favicon %}  
    <link rel="shortcut icon" href="{% static 'images/favicon.ico' %}" />  
{% endblock %}
```

### branding\_login

To replace the login message, create a template file dashboard/templates/wagtailadmin/login.html that overrides the block branding\_login:

```
{% extends "wagtailadmin/login.html" %}  
  
{% block branding_login %}Sign in to Frank's Site{% endblock %}
```

### branding\_welcome

To replace the welcome message on the dashboard, create a template file dashboard/templates/wagtailadmin/home.html that overrides the block branding\_welcome:

```
{% extends "wagtailadmin/home.html" %}  
  
{% block branding_welcome %}Welcome to Frank's Site{% endblock %}
```

## Custom user models

### Custom user forms example

This example shows how to add a text field and foreign key field to a custom user model and configure Wagtail user forms to allow the fields values to be updated.

Create a custom user model. In this case we extend the AbstractUser class and add two fields. The foreign key references another model (not shown).

```
class User(AbstractUser):  
    country = models.CharField(verbose_name='country', max_length=255)  
    status = models.ForeignKey(MembershipStatus, on_delete=models.SET_NULL, null=True, default=1)
```

Add the app containing your user model to INSTALLED\_APPS and set AUTH\_USER\_MODEL to reference your model. In this example the app is called users and the model is User

```
AUTH_USER_MODEL = 'users.User'
```

Create your custom user create and edit forms in your app:

```

from django import forms
from django.utils.translation import ugettext_lazy as _

from wagtail.wagtailusers.forms import UserEditForm, UserCreationForm

from users.models import MembershipStatus

class CustomUserEditForm(UserEditForm):
    country = forms.CharField(required=True, label=_('Country'))
    status = forms.ModelChoiceField(queryset=MembershipStatus.objects, required=True, label=_('Status'))

class CustomUserCreationForm(UserCreationForm):
    country = forms.CharField(required=True, label=_('Country'))
    status = forms.ModelChoiceField(queryset=MembershipStatus.objects, required=True, label=_('Status'))

```

Extend the Wagtail user create and edit templates. These extended template should be placed in a template directory `wagtailusers/users`.

Template `create.html`:

```

{% extends "wagtailusers/users/create.html" %}

{% block extra_fields %}
    {% include "wagtailadmin/shared/field_as_li.html" with field=form.country %}
    {% include "wagtailadmin/shared/field_as_li.html" with field=form.status %}
{% endblock extra_fields %}

```

**Note:** Using `{% extends %}` in this way on a template you're currently overriding is only supported in Django 1.9 and above. On Django 1.8, you will need to use `django-overextends` instead.

Template `edit.html`:

```

{% extends "wagtailusers/users/edit.html" %}

{% block extra_fields %}
    {% include "wagtailadmin/shared/field_as_li.html" with field=form.country %}
    {% include "wagtailadmin/shared/field_as_li.html" with field=form.status %}
{% endblock extra_fields %}

```

The `extra_fields` block allows fields to be inserted below the last name field in the default templates. Other block overriding options exist to allow appending fields to the end or beginning of the existing fields, or to allow all the fields to be redefined.

Add the wagtail settings to your project to reference the user form additions:

```

WAGTAIL_USER_EDIT_FORM = 'users.forms.CustomUserEditForm'
WAGTAIL_USER_CREATION_FORM = 'users.forms.CustomUserCreationForm'
WAGTAIL_USER_CUSTOM_FIELDS = ['country', 'status']

```

## Third-party tutorials

**Warning:** The following list is a collection of tutorials and development notes from third-party developers. Some of the older links may not apply to the latest Wagtail versions.

- Wagtail: 2 Steps for Adding Pages Outside of the CMS (15 February 2016)
- Adding a Twitter Widget for Wagtail’s new StreamField (2 April 2015)
- Working With Wagtail: Menus (22 January 2015)
- Upgrading Wagtail to use Django 1.7 locally using vagrant (10 December 2014)
- Wagtail redirect page. Can link to page, URL and document (24 September 2014)
- Outputing JSON for a model with properties and db fields in Wagtail/Django (24 September 2014)
- Bi-lingual website using Wagtail CMS (17 September 2014)
- Wagtail CMS – Lesser known features (12 September 2014)
- Wagtail notes: stateful on/off hallo.js plugins (9 August 2014)
- Add some blockquote buttons to Wagtail CMS’ WYSIWYG Editor (24 July 2014)
- Adding Bread Crumbs to the front end in Wagtail CMS (1 July 2014)
- Extending hallo.js using Wagtail hooks (9 July 2014)
- Wagtail notes: custom tabs per page type (10 May 2014)
- Wagtail notes: managing redirects as pages (10 May 2014)
- Wagtail notes: dynamic templates per page (10 May 2014)
- Wagtail notes: type-constrained PageChooserPanel (9 May 2014)
- How to Run the Wagtail CMS on Gondor (14 February 2014)

---

**Tip:** We are working on a collection of Wagtail tutorials and best practices. Please tweet @WagtailCMS or contact us directly to share your Wagtail HOWTOs, development notes or site launches.

---

## Jinja2 template support

Wagtail supports Jinja2 templating for all front end features. More information on each of the template tags below can be found in the [Writing templates](#) documentation.

### Configuring Django

Changed in version 1.3: Jinja2 tags were moved from “templatetags” into “jinja2tags” to separate them from Django template tags.

Django needs to be configured to support Jinja2 templates. As the Wagtail admin is written using regular Django templates, Django has to be configured to use both templating engines. Wagtail supports the Jinja2 backend that ships with Django 1.8 and above. Add the following configuration to the TEMPLATES setting for your app:

```
TEMPLATES = [
    # ...
    {
        'BACKEND': 'django.template.backends.jinja2.Jinja2',
        'APP_DIRS': True,
        'OPTIONS': {
            'extensions': [
                'wagtail.wagtailcore.jinja2tags.core',
                'wagtail.wagtailadmin.jinja2tags.userbar',
            ]
        }
    }
]
```

```

        'wagtail.wagtailimages.jinja2tags.images',
    ],
}
]
]
```

Jinja templates must be placed in a `jinja2/` directory in your app. The template for an `EventPage` model in an `events` app should be created at `events/jinja2/events/event_page.html`.

By default, the Jinja environment does not have any Django functions or filters. The Django documentation has more information on [configuring Jinja for Django](#).

### `self` in templates

In Django templates, `self` can be used to refer to the current page, stream block, or field panel. In Jinja, `self` is reserved for internal use. When writing Jinja templates, use `page` to refer to pages, `value` for stream blocks, and `field_panel` for field panels.

## Template tags, functions & filters

### `pageurl()`

Generate a URL for a Page instance:

```
<a href="{{ pageurl(page.more_information) }}>More information</a>
```

See `pageurl` for more information

### `slugurl()`

Generate a URL for a Page with a slug:

```
<a href="{{ slugurl("about") }}>About us</a>
```

See `slugurl` for more information

### `image()`

Resize an image, and print an `<img>` tag:

```

<# Print an image tag #>
{{ image(page.header_image, "fill-1024x200", class="header-image") }}

<# Resize an image #>
{%
  set background=image(page.background_image, "max-1024x1024")
%}
<div class="wrapper" style="background-image: url({{ background.url }});>
```

See [Using images in templates](#) for more information

### `|richtext`

Transform Wagtail's internal HTML representation, expanding internal references to pages and images.

```
{% page.body|richtext %}
```

See [Rich text \(filter\)](#) for more information

### wagtailuserbar()

Output the Wagtail contextual flyout menu for editing pages from the front end

```
{% wagtailuserbar() %}
```

See [Wagtail User Bar](#) for more information

### {% include\_block %}

Output the HTML representation for the stream content as a whole, as well as for each individual block.

Allows to pass template context (by default) to the StreamField template.

```
{% include_block page.body %}
{% include_block page.body with context %} # The same as the previous #
{% include_block page.body without context %}
```

See [StreamField template rendering](#) for more information.

---

**Note:** The `{% include_block %}` tag is designed to closely follow the syntax and behaviour of Ninja's `{% include %}`, so it does not implement the Django version's feature of only passing specified variables into the context.

---

## Testing your Wagtail site

Wagtail comes with some utilities that simplify writing tests for your site.

### WagtailPageTests

```
class wagtail.tests.utils.WagtailPageTests
```

`WagtailPageTests` extends `django.test.TestCase`, adding a few new `assert` methods. You should extend this class to make use of its methods:

```
from wagtail.tests.utils import WagtailPageTests
from myapp.models import MyPage
```

```
class MyPageTests(WagtailPageTests):
    def test_can_create_a_page(self):
        ...
```

```
assertCanCreateAt(parent_model, child_model, msg=None)
```

Assert a particular child Page type can be created under a parent Page type. `parent_model` and `child_model` should be the Page classes being tested.

```
def test_can_create_under_home_page(self):
    # You can create a ContentPage under a HomePage
    self.assertCanCreateAt(HomePage, ContentPage)
```

**assertCannotCreateAt**(parent\_model, child\_model, msg=None)

Assert a particular child Page type can not be created under a parent Page type. parent\_model and child\_model should be the Page classes being tested.

```
def test_cant_create_under_event_page(self):
    # You can not create a ContentPage under an EventPage
    self.assertCannotCreateAt(EventPage, ContentPage)
```

**assertCanCreate**(parent, child\_model, data, msg=None)

Assert that a child of the given Page type can be created under the parent, using the supplied POST data.

parent should be a Page instance, and child\_model should be a Page subclass. data should be a dict that will be POSTed at the Wagtail admin Page creation method.

```
def test_can_create_content_page(self):
    # Get the HomePage
    root_page = HomePage.objects.get(pk=2)

    # Assert that a ContentPage can be made here, with this POST data
    self.assertCanCreate(root_page, ContentPage, {
        'title': 'About us',
        'body': 'Lorem ipsum dolor sit amet'}
```

**assertAllowedParentPageTypes**(child\_model, parent\_models, msg=None)

Test that the only page types that child\_model can be created under are parent\_models.

The list of allowed parent models may differ from those set in Page.parent\_page\_types, if the parent models have set Page.subpage\_types.

```
def test_content_page_parent_pages(self):
    # A ContentPage can only be created under a HomePage
    # or another ContentPage
    self.assertAllowedParentPageTypes(
        ContentPage, {HomePage, ContentPage})

    # An EventPage can only be created under an EventIndex
    self.assertAllowedParentPageTypes(
        EventPage, {EventIndex})
```

**assertAllowedSubpageTypes**(parent\_model, child\_models, msg=None)

Test that the only page types that can be created under parent\_model are child\_models.

The list of allowed child models may differ from those set in Page.subpage\_types, if the child models have set Page.parent\_page\_types.

```
def test_content_page_subpages(self):
    # A ContentPage can only have other ContentPage children
    self.assertAllowedSubpageTypes(
        ContentPage, {ContentPage})

    # A HomePage can have ContentPage and EventIndex children
    self.assertAllowedParentPageTypes(
        HomePage, {ContentPage, EventIndex})
```

## Wagtail API

The API module provides a public-facing, JSON-formatted API to allow retrieving content as raw field data. This is useful for cases like serving content to non-web clients (such as a mobile phone app) or pulling content out of Wagtail for use in another site.

There are currently two versions of the API available: v1 and v2. Both versions are “stable” so it is recommended to use v2. V1 is only provided for backwards compatibility and will be removed from Wagtail soon.

See [RFC 8: Wagtail API](#) for full details on our stabilisation policy.

### Version 2 (recommended)

#### Wagtail API v2 Configuration Guide

This section of the docs will show you how to set up a public API for your Wagtail site.

Even though the API is built on Django REST Framework, you do not need to install this manually as it is already a dependency of Wagtail.

#### Basic configuration

**Enable the app** Firstly, you need to enable Wagtail’s API app so Django can see it. Add `wagtail.api.v2` to `INSTALLED_APPS` in your Django project settings:

```
# settings.py

INSTALLED_APPS = [
    ...
    'wagtail.api.v2',
    ...
]
```

Optionally, you may also want to add `rest_framework` to `INSTALLED_APPS`. This would make the API browsable when viewed from a web browser but is not required for basic JSON-formatted output.

**Configure endpoints** Next, it’s time to configure which content will be exposed on the API. Each content type (such as pages, images and documents) has its own endpoint. Endpoints are combined by a router, which provides the url configuration you can hook into the rest of your project.

Wagtail provides three endpoint classes you can use:

- Pages `wagtail.api.v2.endpoints.PagesAPIEndpoint`
- Images `wagtail.wagtailimages.api.v2.endpoints.ImagesAPIEndpoint`
- Documents `wagtail.wagtaildocs.api.v2.endpoints.DocumentsAPIEndpoint`

You can subclass any of these endpoint classes to customise their functionality. Additionally, there is a base endpoint class you can use for adding different content types to the API: `wagtail.api.v2.endpoints.BaseAPIEndpoint`

For this example, we will create an API that includes all three builtin content types in their default configuration:

```
# api.py

from wagtail.api.v2.endpoints import PagesAPIEndpoint
from wagtail.api.v2.router import WagtailAPIRouter
from wagtail.wagtailimages.api.v2.endpoints import ImagesAPIEndpoint
from wagtail.wagtaildocs.api.v2.endpoints import DocumentsAPIEndpoint
```

```
# Create the router. "wagtailapi" is the URL namespace
api_router = WagtailAPIRouter('wagtailapi')

# Add the three endpoints using the "register_endpoint" method.
# The first parameter is the name of the endpoint (eg. pages, images). This
# is used in the URL of the endpoint
# The second parameter is the endpoint class that handles the requests
api_router.register_endpoint('pages', PagesAPIEndpoint)
api_router.register_endpoint('images', ImagesAPIEndpoint)
api_router.register_endpoint('documents', DocumentsAPIEndpoint)
```

Next, register the URLs so Django can route requests into the API:

```
# urls.py

from .api import api_router

urlpatterns = [
    ...
    url(r'^api/v2/', api_router.urls),
    ...
]
```

With this configuration, pages will be available at `/api/v2/pages/`, images at `/api/v2/images/` and documents at `/api/v2/documents/`

**Adding custom page fields** It's likely that you would need to export some custom fields over the API. This can be done by adding a list of fields to be exported into the `api_fields` attribute for each page model.

For example:

```
# blog/models.py

class BlogPageAuthor(Orderable):
    page = models.ForeignKey('blog.BlogPage', related_name='authors')
    name = models.CharField(max_length=255)

    api_fields = ['name']

class BlogPage(Page):
    published_date = models.DateTimeField()
    body = RichTextField()
    feed_image = models.ForeignKey('wagtailimages.Image', ...)
    private_field = models.CharField(max_length=255)

    # Export fields over the API
    api_fields = [
        'published_date',
        'body',
        'feed_image',
        'authors', # This will nest the relevant BlogPageAuthor objects in the API response
    ]
```

This will make `published_date`, `body`, `feed_image` and a list of `authors` with the `name` field available in the API. But to access these fields, you must select the `blog.BlogPage` type using the `?type parameter in the`

*API itself.*

## Additional settings

### **WAGTAILAPI\_BASE\_URL** (required when using frontend cache invalidation)

This is used in two places, when generating absolute URLs to document files and invalidating the cache.

Generating URLs to documents will fall back to the current request's hostname if this is not set. Cache invalidation cannot do this, however, so this setting must be set when using this module alongside the `wagtailfrontendcache` module.

### **WAGTAILAPI\_SEARCH\_ENABLED** (default: True)

Setting this to false will disable full text search. This applies to all endpoints.

### **WAGTAILAPI\_LIMIT\_MAX** (default: 20)

This allows you to change the maximum number of results a user can request at a time. This applies to all endpoints.

## Wagtail API v2 Usage Guide

---

**Note:** This is the usage guide for version 2 of the API. For version 1, see [Wagtail API Usage Guide](#)

---

The Wagtail API module exposes a public, read only, JSON-formatted API which can be used by external clients (such as a mobile app) or the site's frontend.

This document is intended for developers using the API exposed by Wagtail. For documentation on how to enable the API module in your Wagtail site, see [Wagtail API v2 Configuration Guide](#)

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**Fetching content** To fetch content over the API, perform a GET request against one of the following endpoints:

- Pages /api/v2/pages/
- Images /api/v2/images/
- Documents /api/v2/documents/

---

**Note:** The available endpoints and their URLs may vary from site to site, depending on how the API has been configured.

---

**Example response** Each response contains the list of items (`items`) and the total count (`meta.total_count`). The total count is irrespective of pagination.

```
GET /api/v2/endpoint_name/
HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": "total number of results"
    },
    "items": [
```

```
{  
    "id": 1,  
    "meta": {  
        "type": "app_name.ModelName",  
        "detail_url": "http://api.example.com/api/v2/endpoint_name/1/"  
    },  
    "field": "value"  
},  
{  
    "id": 2,  
    "meta": {  
        "type": "app_name.ModelName",  
        "detail_url": "http://api.example.com/api/v2/endpoint_name/2/"  
    },  
    "field": "different value"  
}  
]  
}
```

**Custom page fields in the API** Wagtail sites contain many page types, each with their own set of fields. The `pages` endpoint will only expose the common fields by default (such as `title` and `slug`).

To access custom page fields with the API, select the page type with the `?type` parameter. This will filter the results to only include pages of that type but will also make all the exported custom fields for that type available in the API.

For example, to access the `published_date`, `body` and `authors` fields on the `blog.BlogPage` model in the *configuration docs*:

```
GET /api/v2/pages/?type=blog.BlogPage&fields=published_date,body,authors(name)
```

```
HTTP 200 OK
```

```
Content-Type: application/json
```

```
{  
    "meta": {  
        "total_count": 10  
    },  
    "items": [  
        {  
            "id": 1,  
            "meta": {  
                "type": "blog.BlogPage",  
                "detail_url": "http://api.example.com/api/v2/pages/1/",  
                "html_url": "http://www.example.com/blog/my-blog-post/",  
                "slug": "my-blog-post",  
                "first_published_at": "2016-08-30T16:52:00Z"  
            },  
            "title": "Test blog post",  
            "published_date": "2016-08-30",  
            "authors": [  
                {  
                    "id": 1,  
                    "meta": {  
                        "type": "blog.BlogPageAuthor",  
                    },  
                    "name": "Karl Hobley"  
                }  
            ]  
        }  
    ]  
}
```

```

    },
    ...
]
}
```

---

**Note:** Only fields that have been explicitly exported by the developer may be used in the API. This is done by adding a `api_fields` attribute to the page model. You can read about configuration [here](#).

---

This doesn't apply to images/documents as there is only one model exposed in those endpoints. But for projects that have customised image/document models, the `api_fields` attribute can be used to export any custom fields into the API.

**Pagination** The number of items in the response can be changed by using the `?limit` parameter (default: 20) and the number of items to skip can be changed by using the `?offset` parameter.

For example:

```
GET /api/v2/pages/?offset=20&limit=20

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 50
    },
    "items": [
        pages 20 - 40 will be listed here.
    ]
}
```

---

**Note:** There may be a maximum value for the `?limit` parameter. This can be modified in your project settings by setting `WAGTAILAPI_LIMIT_MAX` to either a number (the new maximum value) or `None` (which disables maximum value check).

---

**Ordering** The results can be ordered by any field by setting the `?order` parameter to the name of the field to order by.

```
GET /api/v2/pages/?order=title

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 50
    },
    "items": [
        pages will be listed here in ascending title order (a-z)
    ]
}
```

The results will be ordered in ascending order by default. This can be changed to descending order by prefixing the field name with a – sign.

```
GET /api/v2/pages/?order=-title

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 50
    },
    "items": [
        pages will be listed here in descending title order (z-a)
    ]
}
```

---

**Note:** Ordering is case-sensitive so lowercase letters are always ordered after uppercase letters when in ascending order.

---

**Random ordering** Passing `random` into the `?order` parameter will make results return in a random order. If there is no caching, each request will return results in a different order.

```
GET /api/v2/pages/?order=random

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 50
    },
    "items": [
        pages will be listed here in random order
    ]
}
```

---

**Note:** It's not possible to use `?offset` while ordering randomly because consistent random ordering cannot be guaranteed over multiple requests (so requests for subsequent pages may return results that also appeared in previous pages).

---

**Filtering** Any field may be used in an exact match filter. Use the filter name as the parameter and the value to match against.

For example, to find a page with the slug “about”:

```
GET /api/v2/pages/?slug=about

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
```

```

        "total_count": 1
    },
    "items": [
        {
            "id": 10,
            "meta": {
                "type": "standard.StandardPage",
                "detail_url": "http://api.example.com/api/v2/pages/10/",
                "html_url": "http://www.example.com/about/",
                "slug": "about",
                "first_published_at": "2016-08-30T16:52:00Z"
            },
            "title": "About"
        },
    ],
}

```

**Filtering by tree position (pages only)** Pages can additionally be filtered by their position of the tree. For this, there are two parameters you can use: `?child_of` and `?descendant_of`.

The `?child_of` filter takes the id of a page and filters the list of results to contain only direct children of that page.

For example, this can be useful for constructing the main menu, by passing the id of the homepage to the filter:

```

GET /api/v2/pages/?child_of=2&show_in_menus=true

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 5
    },
    "items": [
        {
            "id": 3,
            "meta": {
                "type": "blog.BlogIndexPage",
                "detail_url": "http://api.example.com/api/v2/pages/3/",
                "html_url": "http://www.example.com/blog/",
                "slug": "blog",
                "first_published_at": "2016-09-21T13:54:00Z"
            },
            "title": "About"
        },
        {
            "id": 10,
            "meta": {
                "type": "standard.StandardPage",
                "detail_url": "http://api.example.com/api/v2/pages/10/",
                "html_url": "http://www.example.com/about/",
                "slug": "about",
                "first_published_at": "2016-08-30T16:52:00Z"
            },
            "title": "About"
        },
        ...
    ]
}

```

```
    ]  
}
```

The `?descendant_of` filter also takes the id of a page but includes all descendants (children of children) instead of just directly children.

**Search** Passing a query to the `?search` parameter will perform a full-text search on the results.

The query is split into “terms” (by word boundary), then each term is normalised (lowercased and unaccented).

For example: `?search=James+Joyce`

**Search operator** The `search_operator` specifies how multiple terms in the query should be handled. There are two possible values:

- `and` - All terms in the search query (excluding stop words) must exist in each result
- `or` - At least one term in the search query must exist in each result

The `or` operator is generally better than `and` as it allows the user to be inexact with their query and the ranking algorithm will make sure that irrelevant results are not returned at the top of the page.

The default search operator depends on whether the search engine being used by the site supports ranking. If it does (Elasticsearch), the operator will default to `or`. Otherwise (database), it will default to `and`.

For the same reason, it’s also recommended to use the `and` operator when using `?search` in conjunction with `?order` (as this disables ranking).

For example: `?search=James+Joyce&order=-first_published_at&search_operator=and`

**Fields** By default, only a subset of the available fields are returned in the response. The `?fields` parameter can be used to both add additional fields to the response and remove default fields that you know you won’t need.

**Additional fields** Additional fields can be added to the response by setting `?fields` to a comma-separated list of field names you want to add.

For example, `?fields=body, feed_image` will add the `body` and `feed_image` fields to the response.

This can also be used across relationships. For example, `?fields=body, feed_image(width, height)` will nest the `width` and `height` of the image in the response.

**All fields** Setting `?fields` to an asterisk (\*) will add all available fields to the response. This is useful for discovering what fields have been exported.

For example: `?fields=*`

**Removing fields** Fields you know that you do not need can be removed by prefixing the name with a `-` and adding it to `?fields`.

For example, `?fields=-title, body` will remove `title` and add `body`.

This can also be used with the asterisk. For example, `?fields=*, -body` adds all fields except for `body`.

**Removing all default fields** To specify exactly the fields you need, you can set the first item in `fields` to an underscore (`_`) which removes all default fields.

For example, `?fields=_title` will only return the `title` field.

**Detail views** You can retrieve a single object from the API by appending its id to the end of the URL. For example:

- Pages /api/v2/pages/1/
- Images /api/v2/images/1/
- Documents /api/v2/documents/1/

All exported fields will be returned in the response by default. You can use the `?fields` parameter to customise which fields are shown.

For example: `/api/v2/pages/1/?fields_=,title,body` will return just the title and body of the page with the id of 1.

## Default endpoint fields

**Common fields** These fields are returned by every endpoint.

**id (number)** The unique ID of the object

---

**Note:** Except for page types, every other content type has its own id space so you must combine this with the `type` field in order to get a unique identifier for an object.

---

**type (string)** The type of the object in `app_label.ModelName` format

**detail\_url (string)** The URL of the detail view for the object

## Pages

**title (string), meta.slug (string), meta.show\_in\_menus (boolean), meta.seo\_title (string), meta.search\_desc (string)**  
These values are taken from their corresponding fields on the page

**meta.html\_url (string)** If the site has an HTML frontend that's generated by Wagtail, this field will be set to the URL of this page

**meta.parent** Nests some information about the parent page (only available on detail views)

## Images

**title (string)** The value of the image's title field. Within Wagtail, this is used in the image's `alt` HTML attribute.

**width (number), height (number)** The size of the original image file

**meta.tags (list of strings)** A list of tags associated with the image

## Documents

**title (string)** The value of the document's title field

**meta.tags (list of strings)** A list of tags associated with the document

**meta.download\_url (string)** A URL to the document file

## Changes since v1

### Breaking changes

- The results list in listing responses has been renamed to `items` (was previously either `pages`, `images` or `documents`)

### Major features

- The `fields` parameter has been improved to allow removing fields, adding all fields and customising nested fields

### Minor features

- `html_url`, `slug`, `first_published_at`, `expires_at` and `show_in_menus` fields have been added to the `pages` endpoint
- `download_url` field has been added to the `documents` endpoint
- Multiple page types can be specified in `type` parameter on `pages` endpoint
- `true` and `false` may now be used when filtering boolean fields
- `order` can now be used in conjunction with `search`
- `search_operator` parameter was added

### Version 1

See [Wagtail API](#)

## Reference

### Pages

Wagtail requires a little careful setup to define the types of content that you want to present through your website. The basic unit of content in Wagtail is the [Page](#), and all of your page-level content will inherit basic webpage-related properties from it. But for the most part, you will be defining content yourself, through the construction of Django models using Wagtail's `Page` as a base.

Wagtail organizes content created from your models in a tree, which can have any structure and combination of model objects in it. Wagtail doesn't prescribe ways to organize and interrelate your content, but here we've sketched out some strategies for organizing your models.

The presentation of your content, the actual webpages, includes the normal use of the Django template system. We'll cover additional functionality that Wagtail provides at the template level later on.

### Theory

#### Introduction to Trees

If you're unfamiliar with trees as an abstract data type, you might want to [review the concepts involved](#).

As a web developer, though, you probably already have a good understanding of trees as filesystem directories or paths. Wagtail pages can create the same structure, as each page in the tree has its own URL path, like so:

```
/people/
    nien-nunb/
        laura-roslin/
events/
    captain-picard-day/
    winter-wrap-up/
```

The Wagtail admin interface uses the tree to organize content for editing, letting you navigate up and down levels in the tree through its Explorer menu. This method of organization is a good place to start in thinking about your own Wagtail models.

**Nodes and Leaves** It might be handy to think of the `Page`-derived models you want to create as being one of two node types: parents and leaves. Wagtail isn't prescriptive in this approach, but it's a good place to start if you're not experienced in structuring your own content types.

**Nodes** Parent nodes on the Wagtail tree probably want to organize and display a browse-able index of their descendants. A blog, for instance, needs a way to show a list of individual posts.

A Parent node could provide its own function returning its descendant objects.

```
class EventPageIndex(Page):
    # ...
    def events(self):
        # Get list of live event pages that are descendants of this page
        events = EventPage.objects.live().descendant_of(self)

        # Filter events list to get ones that are either
        # running now or start in the future
        events = events.filter(date_from__gte=date.today())

        # Order by date
        events = events.order_by('date_from')

    return events
```

This example makes sure to limit the returned objects to pieces of content which make sense, specifically ones which have been published through Wagtail's admin interface (`live()`) and are children of this node (`descendant_of(self)`). By setting a `subpage_types` class property in your model, you can specify which models are allowed to be set as children, and by setting a `parent_page_types` class property, you can specify which models are allowed to be parents of this page model. Wagtail will allow any `Page`-derived model by default. Regardless, it's smart for a parent model to provide an index filtered to make sense.

**Leaves** Leaves are the pieces of content itself, a page which is consumable, and might just consist of a bunch of properties. A blog page leaf might have some body text and an image. A person page leaf might have a photo, a name, and an address.

It might be helpful for a leaf to provide a way to back up along the tree to a parent, such as in the case of breadcrumbs navigation. The tree might also be deep enough that a leaf's parent won't be included in general site navigation.

The model for the leaf could provide a function that traverses the tree in the opposite direction and returns an appropriate ancestor:

```
class EventPage(Page):
    # ...
    def event_index(self):
```

```
# Find closest ancestor which is an event index
return self.get_ancestors().type(EventIndexPage).last()
```

If defined, `subpage_types` and `parent_page_types` will also limit the parent models allowed to contain a leaf. If not, Wagtail will allow any combination of parents and leafs to be associated in the Wagtail tree. Like with index pages, it's a good idea to make sure that the index is actually of the expected model to contain the leaf.

**Other Relationships** Your Page-derived models might have other interrelationships which extend the basic Wagtail tree or depart from it entirely. You could provide functions to navigate between siblings, such as a “Next Post” link on a blog page (`post->post->post`). It might make sense for subtrees to interrelate, such as in a discussion forum (`forum->post->replies`) Skipping across the hierarchy might make sense, too, as all objects of a certain model class might interrelate regardless of their ancestors (`events = EventPage.objects.all`). It’s largely up to the models to define their interrelations, the possibilities are really endless.

### Anatomy of a Wagtail Request

For going beyond the basics of model definition and interrelation, it might help to know how Wagtail handles requests and constructs responses. In short, it goes something like:

1. Django gets a request and routes through Wagtail’s URL dispatcher definitions
2. Wagtail checks the hostname of the request to determine which `Site` record will handle this request.
3. Starting from the root page of that site, Wagtail traverses the page tree, calling the `route()` method and letting each page model decide whether it will handle the request itself or pass it on to a child page.
4. The page responsible for handling the request returns a `RouteResult` object from `route()`, which identifies the page along with any additional `args/kwarg`s to be passed to `serve()`.
5. Wagtail calls `serve()`, which constructs a context using `get_context()`
6. `serve()` finds a template to pass it to using `get_template()`
7. A response object is returned by `serve()` and Django responds to the requester.

You can apply custom behavior to this process by overriding `Page` class methods such as `route()` and `serve()` in your own models. For examples, see [Recipes](#).

## Recipes

### Overriding the `serve()` Method

Wagtail defaults to serving `Page`-derived models by passing a reference to the page object to a Django HTML template matching the model’s name, but suppose you wanted to serve something other than HTML? You can override the `serve()` method provided by the `Page` class and handle the Django request and response more directly.

Consider this example from the Wagtail demo site’s `models.py`, which serves an `EventPage` object as an iCal file if the `format` variable is set in the request:

```
class EventPage(Page):
    ...
    def serve(self, request):
        if "format" in request.GET:
            if request.GET['format'] == 'ical':
                # Export to ical format
```

```

        response = HttpResponse(
            export_event(self, 'ical'),
            content_type='text/calendar',
        )
        response['Content-Disposition'] = 'attachment; filename=' + self.slug + '.ics'
        return response
    else:
        # Unrecognised format error
        message = 'Could not export event\n\nUnrecognised format: ' + request.GET['format']
        return HttpResponse(message, content_type='text/plain')
    else:
        # Display event page as usual
        return super(EventPage, self).serve(request)

```

`serve()` takes a Django request object and returns a Django response object. Wagtail returns a `TemplateResponse` object with the template and context which it generates, which allows middleware to function as intended, so keep in mind that a simpler response object like a `HttpResponse` will not receive these benefits.

With this strategy, you could use Django or Python utilities to render your model in JSON or XML or any other format you'd like.

### Adding Endpoints with Custom `route()` Methods

---

**Note:** A much simpler way of adding more endpoints to pages is provided by the `wagtailroutablepage` module.

---

Wagtail routes requests by iterating over the path components (separated with a forward slash /), finding matching objects based on their slug, and delegating further routing to that object's model class. The Wagtail source is very instructive in figuring out what's happening. This is the default `route()` method of the `Page` class:

```

class Page(...):
    ...

    def route(self, request, path_components):
        if path_components:
            # request is for a child of this page
            child_slug = path_components[0]
            remaining_components = path_components[1:]

            # find a matching child or 404
            try:
                subpage = self.get_children().get(slug=child_slug)
            except Page.DoesNotExist:
                raise Http404

            # delegate further routing
            return subpage.specific.route(request, remaining_components)

        else:
            # request is for this very page
            if self.live:
                # Return a RouteResult that will tell Wagtail to call
                # this page's serve() method
                return RouteResult(self)
            else:

```

```
# the page matches the request, but isn't published, so 404
raise Http404
```

`route()` takes the current object (`self`), the `request` object, and a list of the remaining `path_components` from the request URL. It either continues delegating routing by calling `route()` again on one of its children in the Wagtail tree, or ends the routing process by returning a `RouteResult` object or raising a 404 error.

The `RouteResult` object (defined in `wagtail.wagtailcore.url_routing`) encapsulates all the information Wagtail needs to call a page's `serve()` method and return a final response: this information consists of the page object, and any additional `args/kwarg`s to be passed to `serve()`.

By overriding the `route()` method, we could create custom endpoints for each object in the Wagtail tree. One use case might be using an alternate template when encountering the `print/` endpoint in the path. Another might be a REST API which interacts with the current object. Just to see what's involved, let's make a simple model which prints out all of its child path components.

First, `models.py`:

```
from django.shortcuts import render
from wagtail.wagtailcore.url_routing import RouteResult
from django.http.response import Http404
from wagtail.wagtailcore.models import Page

...
class Echoer(Page):

    def route(self, request, path_components):
        if path_components:
            # tell Wagtail to call self.serve() with an additional 'path_components' kwarg
            return RouteResult(self, kwargs={'path_components': path_components})
        else:
            if self.live:
                # tell Wagtail to call self.serve() with no further args
                return RouteResult(self)
            else:
                raise Http404

    def serve(self, path_components=[]):
        return render(request, self.template, {
            'page': self,
            'echo': ' '.join(path_components),
        })
```

This model, `Echoer`, doesn't define any properties, but does subclass `Page` so objects will be able to have a custom title and slug. The template just has to display our `{% echo %}` property.

Now, once creating a new `Echoer` page in the Wagtail admin titled "Echo Base," requests such as:

```
http://127.0.0.1:8000/echo-base/tauntaun/kennel/bed/and/breakfast/
```

Will return:

```
tauntaun kennel bed and breakfast
```

Be careful if you're introducing new required arguments to the `serve()` method - Wagtail still needs to be able to display a default view of the page for previewing and moderation, and by default will attempt to do this by calling `serve()` with a `request` object and no further arguments. If your `serve()` method does not accept that as a method signature, you will need to override the page's `serve_preview()` method to call `serve()` with suitable arguments:

```
def serve_preview(self, request, mode_name):
    return self.serve(request, color='purple')
```

## Tagging

Wagtail provides tagging capability through the combination of two django modules, `taggit` and `modelcluster`. `taggit` provides a model for tags which is extended by `modelcluster`, which in turn provides some magical database abstraction which makes drafts and revisions possible in Wagtail. It's a tricky recipe, but the net effect is a many-to-many relationship between your model and a tag class reserved for your model.

Using an example from the Wagtail demo site, here's what the tag model and the relationship field looks like in `models.py`:

```
from modelcluster.fields import ParentalKey
from modelcluster.contrib.taggit import ClusterTaggableManager
from taggit.models import TaggedItemBase

class BlogPageTag(TaggedItemBase):
    content_object = ParentalKey('demo.BlogPage', related_name='tagged_items')

class BlogPage(Page):
    ...
    tags = ClusterTaggableManager(through=BlogPageTag, blank=True)

    promote_panels = Page.promote_panels + [
        ...
        FieldPanel('tags'),
    ]
```

Wagtail's admin provides a nice interface for inputting tags into your content, with typeahead tag completion and friendly tag icons.

Now that we have the many-to-many tag relationship in place, we can fit in a way to render both sides of the relation. Here's more of the Wagtail demo site `models.py`, where the index model for `BlogPage` is extended with logic for filtering the index by tag:

```
class BlogIndexPage(Page):
    ...
    def serve(self, request):
        # Get blogs
        blogs = self.blogs

        # Filter by tag
        tag = request.GET.get('tag')
        if tag:
            blogs = blogs.filter(tags__name=tag)

    return render(request, self.template, {
        'page': self,
        'blogs': blogs,
    })
```

Here, `blogs.filter(tags__name=tag)` invokes a reverse Django queryset filter on the `BlogPageTag` model to optionally limit the `BlogPage` objects sent to the template for rendering. Now, let's render both sides of the relation by showing the tags associated with an object and a way of showing all of the objects associated with each tag. This could be added to the `blog_page.html` template:

```
{% for tag in page.tags.all %}  
    <a href="{% pageurl page.blog_index %}?tag={{ tag }}">{{ tag }}</a>  
{% endfor %}
```

Iterating through `page.tags.all` will display each tag associated with `page`, while the link(s) back to the index make use of the filter option added to the `BlogIndexPage` model. A Django query could also use the `tagged_items` related name field to get `BlogPage` objects associated with a tag.

This is just one possible way of creating a taxonomy for Wagtail objects. With all of the components for a taxonomy available through Wagtail, you should be able to fulfill even the most exotic taxonomic schemes.

### Available panel types

#### FieldPanel

```
class wagtail.wagtailadmin.edit_handlers.FieldPanel(field_name, classname=None, widget=None)
```

This is the panel used for basic Django field types.

##### `field_name`

This is the name of the class property used in your model definition.

##### `classname`

This is a string of optional CSS classes given to the panel which are used in formatting and scripted interactivity. By default, panels are formatted as inset fields.

The CSS class `full` can be used to format the panel so it covers the full width of the Wagtail page editor.

The CSS class `title` can be used to give the field a larger text size, suitable for representing page titles and section headings.

##### `widget` (optional)

This parameter allows you to specify a [Django form widget](#) to use instead of the default widget for this field type.

#### MultiFieldPanel

```
class wagtail.wagtailadmin.edit_handlers.MultiFieldPanel(children, heading="", classname=None)
```

This panel condenses several [FieldPanel](#)s or choosers, from a list or tuple, under a single heading string.

##### `children`

A list or tuple of child panels

##### `heading`

A heading for the fields

### Collapsing MultiFieldPanels to save space

By default, MultiFieldPanel s are expanded and not collapsible. Adding `collapsible` to `classname` will enable the collapse control. Adding both `collapsible` and `collapsed` to the `classname` parameter will load the editor page with the MultiFieldPanel collapsed under its heading.

```
content_panels = [
    MultiFieldPanel(
        [
            ImageChooserPanel('cover'),
            DocumentChooserPanel('book_file'),
            PageChooserPanel('publisher'),
        ],
        heading="Collection of Book Fields",
        classname="collapsible collapsed"
    ),
]
```

### InlinePanel

```
class wagtail.wagtailadmin.edit_handlers.InlinePanel(relation_name,      panels=None,
                                                 classname='',           label='',
                                                 help_text='',          min_num=None,
                                                 max_num=None)
```

This panel allows for the creation of a “cluster” of related objects over a join to a separate model, such as a list of related links or slides to an image carousel.

This is a powerful but complex feature which will take some space to cover, so we’ll skip over it for now. For a full explanation on the usage of `InlinePanel`, see [Inline Panels and Model Clusters](#).

### FieldRowPanel

```
class wagtail.wagtailadmin.edit_handlers.FieldRowPanel(children, classname=None)
```

This panel creates a columnar layout in the editing interface, where each of the child Panels appears alongside each other rather than below.

Use of `FieldRowPanel` particularly helps reduce the “snow-blindness” effect of seeing so many fields on the page, for complex models. It also improves the perceived association between fields of a similar nature. For example if you created a model representing an “Event” which had a starting date and ending date, it may be intuitive to find the start and end date on the same “row”.

By default, the panel is divided into equal-width columns, but this can be overridden by adding `col*` class names to each of the child Panels of the `FieldRowPanel`. The Wagtail editing interface is laid out using a grid system, in which the maximum width of the editor is 12 columns. Classes `col1-col12` can be applied to each child of a `FieldRowPanel`. The class `col3` will ensure that field appears 3 columns wide or a quarter the width. `col4` would cause the field to be 4 columns wide, or a third the width.

#### `children`

A list or tuple of child panels to display on the row

#### `classname`

A class to apply to the `FieldRowPanel` as a whole

### PageChooserPanel

```
class wagtail.wagtailadmin.edit_handlers.PageChooserPanel(field_name,
    page_type=None,
    can_choose_root=False)
```

You can explicitly link *Page*-derived models together using the *Page* model and PageChooserPanel.

```
from wagtail.wagtailcore.models import Page
from wagtail.wagtailadmin.edit_handlers import PageChooserPanel

class BookPage(Page):
    related_page = models.ForeignKey(
        'wagtailcore.Page',
        null=True,
        blank=True,
        on_delete=models.SET_NULL,
        related_name='+',
    )

    content_panels = Page.content_panels + [
        PageChooserPanel('related_page', 'demo.PublisherPage'),
    ]
```

PageChooserPanel takes one required argument, the field name. Optionally, specifying a page type (in the form of an "appname.modelname" string) will filter the chooser to display only pages of that type. A list or tuple of page types can also be passed in, to allow choosing a page that matches any of those page types:

```
PageChooserPanel('related_page', ['demo.PublisherPage', 'demo.AuthorPage'])
```

Passing can\_choose\_root=True will allow the editor to choose the tree root as a page. Normally this would be undesirable, since the tree root is never a usable page, but in some specialised cases it may be appropriate; for example, a page with an automatic “related articles” feed could use a PageChooserPanel to select which subsection articles will be taken from, with the root corresponding to ‘everywhere’.

### ImageChooserPanel

```
class wagtail.wagtailimages.edit_handlers.ImageChooserPanel(field_name)
```

Wagtail includes a unified image library, which you can access in your models through the *Image* model and the ImageChooserPanel chooser. Here’s how:

```
from wagtail.wagtailimages.models import Image
from wagtail.wagtailimages.edit_handlers import ImageChooserPanel

class BookPage(Page):
    cover = models.ForeignKey(
        'wagtailimages.Image',
        null=True,
        blank=True,
        on_delete=models.SET_NULL,
        related_name='+'
    )

    content_panels = Page.content_panels + [
        ImageChooserPanel('cover'),
    ]
```

Django's default behaviour is to "cascade" deletions through a ForeignKey relationship, which may not be what you want. This is why the `null`, `blank`, and `on_delete` parameters should be set to allow for an empty field. (See [Django model field reference \(`on\_delete`\)](#)). `ImageChooserPanel` takes only one argument: the name of the field.

Displaying `Image` objects in a template requires the use of a template tag. See [Using images in templates](#).

### FormSubmissionsPanel

```
class wagtail.wagtailforms.edit_handlers.FormSubmissionsPanel
```

This panel adds a single, read-only section in the edit interface for pages implementing the `AbstractForm` model. It includes the number of total submissions for the given form and also a link to the listing of submissions.

```
from wagtail.wagtailforms.models import AbstractForm
from wagtail.wagtailforms.edit_handlers import FormSubmissionsPanel

class ContactFormPage(AbstractForm):
    content_panels = [
        FormSubmissionsPanel(),
    ]
```

### DocumentChooserPanel

```
class wagtail.wagtailedocs.edit_handlers.DocumentChooserPanel (field_name)
```

For files in other formats, Wagtail provides a generic file store through the `Document` model:

```
from wagtail.wagtailedocs.models import Document
from wagtail.wagtailedocs.edit_handlers import DocumentChooserPanel

class BookPage(Page):
    book_file = models.ForeignKey(
        'wagtailedocs.Document',
        null=True,
        blank=True,
        on_delete=models.SET_NULL,
        related_name='+'
    )

    content_panels = Page.content_panels + [
        DocumentChooserPanel('book_file'),
    ]
```

As with images, Wagtail documents should also have the appropriate extra parameters to prevent cascade deletions across a ForeignKey relationship. `DocumentChooserPanel` takes only one argument: the name of the field.

### SnippetChooserPanel

Changed in version 1.1: Before Wagtail 1.1, it was necessary to pass the snippet model class as a second parameter to `SnippetChooserPanel`. This is now automatically picked up from the field.

```
class wagtail.wagtailsnippets.edit_handlers.SnippetChooserPanel (field_name, snip-
pet_type=None)
```

Snippets are vanilla Django models you create yourself without a Wagtail-provided base class. A chooser,

`SnippetChooserPanel`, is provided which takes the field name as an argument.

```
from wagtail.wagtailsnippets.edit_handlers import SnippetChooserPanel

class BookPage(Page):
    advert = models.ForeignKey(
        'demo.Advert',
        null=True,
        blank=True,
        on_delete=models.SET_NULL,
        related_name='+'
    )

    content_panels = Page.content_panels + [
        SnippetChooserPanel('advert'),
    ]
```

See [Snippets](#) for more information.

**Built-in Fields and Choosers** Django's field types are automatically recognised and provided with an appropriate widget for input. Just define that field the normal Django way and pass the field name into [FieldPanel](#) when defining your panels. Wagtail will take care of the rest.

Here are some Wagtail-specific types that you might include as fields in your models.

**Field Customisation** By adding CSS classes to your panel definitions or adding extra parameters to your field definitions, you can control much of how your fields will display in the Wagtail page editing interface. Wagtail's page editing interface takes much of its behaviour from Django's admin, so you may find many options for customisation covered there. (See [Django model field reference](#) ).

### Full-Width Input

Use `classname="full"` to make a field (input element) stretch the full width of the Wagtail page editor. This will not work if the field is encapsulated in a [MultiFieldPanel](#), which places its child fields into a formset.

### Titles

Use `classname="title"` to make Page's built-in title field stand out with more vertical padding.

### Required Fields

To make input or chooser selection mandatory for a field, add `blank=False` to its model definition. (See [Django model field reference](#) (`blank`) ).

### Hiding Fields

Without a panel definition, a default form field (without label) will be used to represent your fields. If you intend to hide a field on the Wagtail page editor, define the field with `editable=False` (See [Django model field reference](#) (`editable`) ).

**Inline Panels and Model Clusters** The `django-modelcluster` module allows for streamlined relation of extra models to a Wagtail page. For instance, you can create objects related through a `ForeignKey` relationship on the fly and save them to a draft revision of a `Page` object. Normally, your related objects “cluster” would need to be created beforehand (or asynchronously) before linking them to a `Page`.

Let’s look at the example of adding related links to a `Page`-derived model. We want to be able to add as many as we like, assign an order, and do all of this without leaving the page editing screen.

```
from wagtail.wagtailcore.models import Orderable, Page
from modelcluster.fields import ParentalKey

# The abstract model for related links, complete with panels
class RelatedLink(models.Model):
    title = models.CharField(max_length=255)
    link_external = models.URLField("External link", blank=True)

    panels = [
        FieldPanel('title'),
        FieldPanel('link_external'),
    ]

    class Meta:
        abstract = True

# The real model which combines the abstract model, an
# Orderable helper class, and what amounts to a ForeignKey link
# to the model we want to add related links to (BookPage)
class BookPageRelatedLinks(Orderable, RelatedLink):
    page = ParentalKey('demo.BookPage', related_name='related_links')

class BookPage(Page):
    # ...

    content_panels = Page.content_panels + [
        InlinePanel('related_links', label="Related Links"),
    ]
```

The `RelatedLink` class is a vanilla Django abstract model. The `BookPageRelatedLinks` model extends it with capability for being ordered in the Wagtail interface via the `Orderable` class as well as adding a `page` property which links the model to the `BookPage` model we’re adding the related links objects to. Finally, in the panel definitions for `BookPage`, we’ll add an `InlinePanel` to provide an interface for it all. Let’s look again at the parameters that `InlinePanel` accepts:

```
InlinePanel( relation_name, panels=None, label='', help_text='', min_num=None, max_num=None )
```

The `relation_name` is the `related_name` label given to the cluster’s `ParentalKey` relation. You can add the `panels` manually or make them part of the cluster model. `label` and `help_text` provide a heading and caption, respectively, for the Wagtail editor. Finally, `min_num` and `max_num` allow you to set the minimum/maximum number of forms that the user must submit.

Changed in version 1.0: In previous versions, it was necessary to pass the base model as the first parameter to `InlinePanel`; this is no longer required.

For another example of using model clusters, see [Tagging](#)

For more on `django-modelcluster`, visit the [django-modelcluster](#) github project page.

## Model Reference

This document contains reference information for the model classes inside the `wagtailcore` module.

### Page

#### Database fields

`class wagtail.wagtailcore.models.Page`

##### `title`

(text)

Human-readable title of the page.

##### `slug`

(text)

This is used for constructing the page's URL.

For example: `http://domain.com/blog/[my-slug]/`

##### `content_type`

(foreign key to `django.contrib.contenttypes.models.ContentType`)

A foreign key to the `ContentType` object that represents the specific model of this page.

##### `live`

(boolean)

A boolean that is set to `True` if the page is published.

Note: this field defaults to `True` meaning that any pages that are created programmatically will be published by default.

##### `has_unpublished_changes`

(boolean)

A boolean that is set to `True` when the page is either in draft or published with draft changes.

##### `owner`

(foreign key to user model)

A foreign key to the user that created the page.

##### `first_published_at`

(date/time)

The date/time when the page was first published.

##### `seo_title`

(text)

Alternate SEO-crafted title, for use in the page's `<title>` HTML tag.

##### `search_description`

(text)

SEO-crafted description of the content, used for search indexing. This is also suitable for the page's `<meta name="description">` HTML tag.

**show\_in\_menus**  
(boolean)

Toggles whether the page should be included in site-wide menus.

This is used by the `in_menu()` QuerySet filter.

**Methods and properties** In addition to the model fields provided, `Page` has many properties and methods that you may wish to reference, use, or override in creating your own models. Those listed here are relatively straightforward to use, but consult the Wagtail source code for a full view of what's possible.

`class wagtail.wagtailcore.models.Page`

**specific**

Return this page in its most specific subclassed form.

**specific\_class**

Return the class that this page would be if instantiated in its most specific form

**url**

Return the ‘most appropriate’ URL for referring to this page from the pages we serve, within the Wagtail backend and actual website templates; this is the local URL (starting with '/') if we’re only running a single site (i.e. we know that whatever the current page is being served from, this link will be on the same domain), and the full URL (with domain) if not. Return None if the page is not routable.

**full\_url**

Return the full URL (including protocol / domain) to this page, or None if it is not routable

**relative\_url(current\_site)**

Return the ‘most appropriate’ URL for this page taking into account the site we’re currently on; a local URL if the site matches, or a fully qualified one otherwise. Return None if the page is not routable.

**get\_site()**

Return the Site object that this page belongs to.

**get\_url\_parts()**

Determine the URL for this page and return it as a tuple of `(site_id, site_root_url, page_url_relative_to_site_root)`. Return None if the page is not routable.

This is used internally by the `full_url`, `url`, `relative_url` and `get_site` properties and methods; pages with custom URL routing should override this method in order to have those operations return the custom URLs.

**route(request, path\_components)**

**serve(request, \*args, \*\*kwargs)**

**get\_context(request, \*args, \*\*kwargs)**

**get\_template(request, \*args, \*\*kwargs)**

**preview\_modes**

A list of `(internal_name, display_name)` tuples for the modes in which this page can be displayed for preview/moderation purposes. Ordinarily a page will only have one display mode, but subclasses of `Page` can override this - for example, a page containing a form might have a default view of the form, and a post-submission ‘thankyou’ page

**serve\_preview(request, mode\_name)**

Return an HTTP response for use in page previews. Normally this would be equivalent to `self.serve(request)`, since we obviously want the preview to be indicative of how it looks on the live site. However, there are a couple of cases where this is not appropriate, and custom behaviour is required:

1) The page has custom routing logic that derives some additional required args/kwags to be passed to `serve()`. The routing mechanism is bypassed when previewing, so there's no way to know what args we should pass. In such a case, the page model needs to implement its own version of `serve_preview`.

2) The page has several different renderings that we would like to be able to see when previewing - for example, a form page might have one rendering that displays the form, and another rendering to display a landing page when the form is posted. This can be done by setting a custom `preview_modes` list on the page model - Wagtail will allow the user to specify one of those modes when previewing, and pass the chosen `mode_name` to `serve_preview` so that the page model can decide how to render it appropriately. (Page models that do not specify their own `preview_modes` list will always receive an empty string as `mode_name`.)

Any templates rendered during this process should use the 'request' object passed here - this ensures that `request.user` and other properties are set appropriately for the wagtail user bar to be displayed. This request will always be a GET.

**`get_ancestors (inclusive=False)`**

**`get_descendants (inclusive=False)`**

**`get_siblings (inclusive=True)`**

**`search_fields`**

A list of fields to be indexed by the search engine. See Search docs [Indexing extra fields](#)

**`subpage_types`**

A whitelist of page models which can be created as children of this page type. For example, a `BlogIndex` page might allow a `BlogPage` as a child, but not a `JobPage`:

```
class BlogIndex(Page):
    subpage_types = ['mysite.BlogPage', 'mysite.BlogArchivePage']
```

The creation of child pages can be blocked altogether for a given page by setting it's `subpage_types` attribute to an empty array:

```
class BlogPage(Page):
    subpage_types = []
```

**`parent_page_types`**

A whitelist of page models which are allowed as parent page types. For example, a `BlogPage` may only allow itself to be created below the `BlogIndex` page:

```
class BlogPage(Page):
    parent_page_types = ['mysite.BlogIndexPage']
```

Pages can block themselves from being created at all by setting `parent_page_types` to an empty array (this is useful for creating unique pages that should only be created once):

```
class HiddenPage(Page):
    parent_page_types = []
```

**`classmethod can_exist_under (parent)`**

Checks if this page type can exist as a subpage under a parent page instance.

See also: [`Page.can\_create\_at\(\)`](#) and [`Page.can\_move\_to\(\)`](#)

**`classmethod can_create_at (parent)`**

Checks if this page type can be created as a subpage under a parent page instance.

**`can_move_to (parent)`**

Checks if this page instance can be moved to be a subpage of a parent page instance.

**password\_required\_template**

Defines which template file should be used to render the login form for Protected pages using this model. This overrides the default, defined using `PASSWORD_REQUIRED_TEMPLATE` in your settings. See [Private pages](#)

**is\_creatable**

Controls if this page can be created through the Wagtail administration. Defaults to True, and is not inherited by subclasses. This is useful when using [multi-table inheritance](#), to stop the base model from being created as an actual page.

**base\_form\_class**

The form class used as a base for editing Pages of this type in the Wagtail page editor. This attribute can be set on a model to customise the Page editor form. Forms must be a subclass of [WagtailAdminPageForm](#). See [Customising generated forms](#) for more information.

**Site**

The Site model is useful for multi-site installations as it allows an administrator to configure which part of the tree to use for each hostname that the server responds on.

This configuration is used by the `SiteMiddleware` middleware class which checks each request against this configuration and appends the Site object to the Django request object.

**Database fields**

```
class wagtail.wagtailcore.models.Site
```

**hostname**

(text)

This is the hostname of the site, excluding the scheme, port and path.

For example: `www.mysite.com`

---

**Note:** If you're looking for how to get the root url of a site, use the `root_url` attribute.

---

**port**

(number)

This is the port number that the site responds on.

**site\_name**

(text - optional)

A human-readable name for the site. This is not used by Wagtail itself, but is suitable for use on the site front-end, such as in `<title>` elements.

For example: Rod's World of Birds

**root\_page**

(foreign key to [Page](#))

This is a link to the root page of the site. This page will be what appears at the / URL on the site and would usually be a homepage.

**is\_default\_site**

(boolean)

This is set to `True` if the site is the default. Only one site can be the default.

The default site is used as a fallback in situations where a site with the required hostname/port couldn't be found.

### Methods and properties

`class wagtail.wagtailcore.models.Site`

`static find_for_request (request)`

Find the site object responsible for responding to this HTTP request object. Try:

- unique hostname first
- then hostname and port
- if there is no matching hostname at all, or no matching hostname:port combination, fall back to the unique default site, or raise an exception

NB this means that high-numbered ports on an extant hostname may still be routed to a different hostname which is set as the default

`root_url`

This returns the URL of the site. It is calculated from the `hostname` and the `port` fields.

The scheme part of the URL is calculated based on value of the `port` field:

- `80 = http://`
- `443 = https://`
- Everything else will use the `http://` scheme and the port will be appended to the end of the hostname (eg. `http://mysite.com:8000/`)

`static get_site_root_paths ()`

Return a list of (`root_path`, `root_url`) tuples, most specific path first - used to translate `url_paths` into actual URLs with hostnames

### PageRevision

Every time a page is edited a new `PageRevision` is created and saved to the database. It can be used to find the full history of all changes that have been made to a page and it also provides a place for new changes to be kept before going live.

- Revisions can be created from any `Page` object by calling its `save_revision()` method
- The content of the page is JSON-serialised and stored in the `content_json` field
- You can retrieve a `PageRevision` as a `Page` object by calling the `as_page_object()` method

### Database fields

`class wagtail.wagtailcore.models.PageRevision`

`page`

(foreign key to `Page`)

`submitted_for_moderation`

(boolean)

`True` if this revision is in moderation

**created\_at**  
(date/time)

This is the time the revision was created

**user**  
(foreign key to user model)

This links to the user that created the revision

**content\_json**  
(text)

This field contains the JSON content for the page at the time the revision was created

### Managers

**class wagtail.wagtailcore.models.PageRevision**

**objects**

This manager is used to retrieve all of the `PageRevision` objects in the database

Example:

```
PageRevision.objects.all()
```

**submitted\_revisions**

This manager is used to retrieve all of the `PageRevision` objects that are awaiting moderator approval

Example:

```
PageRevision.submitted_revisions.all()
```

### Methods and properties

**class wagtail.wagtailcore.models.PageRevision**

**as\_page\_object()**

This method retrieves this revision as an instance of its `Page` subclass.

**approve\_moderation()**

Calling this on a revision that's in moderation will mark it as approved and publish it

**reject\_moderation()**

Calling this on a revision that's in moderation will mark it as rejected

**is\_latest\_revision()**

Returns True if this revision is its page's latest revision

**publish()**

Calling this will copy the content of this revision into the live page object. If the page is in draft, it will be published.

**GroupPagePermission**

### Database fields

**class wagtail.wagtailcore.models.GroupPagePermission**

```
group  
    (foreign key to django.contrib.auth.models.Group)  
  
page  
    (foreign key to Page)  
  
permission_type  
    (choice list)
```

### [PageViewRestriction](#)

#### Database fields

```
class wagtail.wagtailcore.models.PageViewRestriction
```

```
page  
    (foreign key to Page)  
  
password  
    (text)
```

### [Orderable \(abstract\)](#)

#### Database fields

```
class wagtail.wagtailcore.models.Orderable
```

```
sort_order  
    (number)
```

### [Page QuerySet reference](#)

All models that inherit from [Page](#) are given some extra QuerySet methods accessible from their `.objects` attribute.

#### Examples

- Selecting only live pages

```
live_pages = Page.objects.live()
```

- Selecting published EventPages that are descendants of `events_index`

```
events = EventPage.objects.live().descendant_of(events_index)
```

- Getting a list of menu items

```
# This gets a QuerySet of live children of the homepage with ``show_in_menus`` set
menu_items = homepage.get_children().live().in_menu()
```

#### Reference

```
class wagtail.wagtailcore.query.PageQuerySet(model=None, query=None, using=None,
                                              hints=None)
```

**live()**

This filters the QuerySet to only contain published pages.

Example:

```
published_pages = Page.objects.live()
```

**not\_live()**

This filters the QuerySet to only contain unpublished pages.

Example:

```
unpublished_pages = Page.objects.not_live()
```

**in\_menu()**

This filters the QuerySet to only contain pages that are in the menus.

Example:

```
# Build a menu from live pages that are children of the homepage
menu_items = homepage.get_children().live().in_menu()
```

**Note:** To put your page in menus, set the `show_in_menus` flag to true:

```
# Add 'my_page' to the menu
my_page.show_in_menus = True
```

**not\_in\_menu()**

This filters the QuerySet to only contain pages that are not in the menus.

**page(*other*)**

This filters the QuerySet so it only contains the specified page.

Example:

```
# Append an extra page to a QuerySet
new_queryset = old_queryset | Page.objects.page(page_to_add)
```

**not\_page(*other*)**

This filters the QuerySet so it doesn't contain the specified page.

Example:

```
# Remove a page from a QuerySet
new_queryset = old_queryset & Page.objects.not_page(page_to_remove)
```

**descendant\_of(*other*, *inclusive=False*)**

This filters the QuerySet to only contain pages that descend from the specified page.

If `inclusive` is set to True, it will also contain the page itself (instead of just its descendants).

Example:

```
# Get EventPages that are under the special_events Page
special_events = EventPage.objects.descendant_of(special_events_index)

# Alternative way
special_events = special_events_index.get_descendants()
```

**not\_descendant\_of(*other*, *inclusive=False*)**

This filters the QuerySet to not contain any pages that descend from the specified page.

If inclusive is set to True, it will also exclude the specified page.

Example:

```
# Get EventPages that are not under the archived_events Page
non_archived_events = EventPage.objects.not_descendant_of(archived_events_index)
```

### **child\_of(*other*)**

This filters the QuerySet to only contain pages that are direct children of the specified page.

Example:

```
# Get a list of sections
sections = Page.objects.child_of(homepage)

# Alternative way
sections = homepage.get_children()
```

### **not\_child\_of(*other*)**

This filters the QuerySet to not contain any pages that are direct children of the specified page.

### **ancestor\_of(*other, inclusive=False*)**

This filters the QuerySet to only contain pages that are ancestors of the specified page.

If inclusive is set to True, it will also include the specified page.

Example:

```
# Get the current section
current_section = Page.objects.ancestor_of(current_page).child_of(homepage).first()

# Alternative way
current_section = current_page.get_ancestors().child_of(homepage).first()
```

### **not\_ancestor\_of(*other, inclusive=False*)**

This filters the QuerySet to not contain any pages that are ancestors of the specified page.

If inclusive is set to True, it will also exclude the specified page.

Example:

```
# Get the other sections
other_sections = Page.objects.not_ancestor_of(current_page).child_of(homepage)
```

### **parent\_of(*other*)**

This filters the QuerySet to only contain the parent of the specified page.

### **not\_parent\_of(*other*)**

This filters the QuerySet to exclude the parent of the specified page.

### **sibling\_of(*other, inclusive=True*)**

This filters the QuerySet to only contain pages that are siblings of the specified page.

By default, inclusive is set to True so it will include the specified page in the results.

If inclusive is set to False, the page will be excluded from the results.

Example:

```
# Get list of siblings
siblings = Page.objects.sibling_of(current_page)

# Alternative way
siblings = current_page.get_siblings()
```

**not\_sibling\_of**(*other*, *inclusive=True*)

This filters the QuerySet to not contain any pages that are siblings of the specified page.

By default, inclusive is set to True so it will exclude the specified page from the results.

If inclusive is set to False, the page will be included in the results.

**public()**

This filters the QuerySet to only contain pages that are not in a private section

See: [Private pages](#)

---

**Note:** This doesn't filter out unpublished pages. If you want to only have published public pages, use `.live().public()`

---

Example:

```
# Find all the pages that are viewable by the public
all_pages = Page.objects.live().public()
```

**not\_public()**

This filters the QuerySet to only contain pages that are in a private section

**search**(*query\_string*, *fields=None*, *operator=None*, *order\_by\_relevance=True*, *backend=u'default'*)

This runs a search query on all the items in the QuerySet

See: [Searching QuerySets](#)

Example:

```
# Search future events
results = EventPage.objects.live().filter(date__gt=timezone.now()).search("Hello")
```

**type**(*model*)

This filters the QuerySet to only contain pages that are an instance of the specified model (including subclasses).

Example:

```
# Find all pages that are of type AbstractEmailForm, or a descendant of it
form_pages = Page.objects.type(AbstractEmailForm)
```

**not\_type**(*model*)

This filters the QuerySet to not contain any pages which are an instance of the specified model.

**exact\_type**(*model*)

This filters the QuerySet to only contain pages that are an instance of the specified model (matching the model exactly, not subclasses).

Example:

```
# Find all pages that are of the exact type EventPage
event_pages = Page.objects.exact_type(EventPage)
```

**not\_exact\_type**(*model*)

This filters the QuerySet to not contain any pages which are an instance of the specified model (matching the model exactly, not subclasses).

Example:

```
# Find all pages that are not of the exact type EventPage (but may be a subclass)
non_event_pages = Page.objects.not_exact_type(EventPage)
```

### unpublish()

This unpublishes all live pages in the QuerySet.

Example:

```
# Unpublish current_page and all of its children
Page.objects.descendant_of(current_page, inclusive=True).unpublish()
```

### specific()

This efficiently gets all the specific pages for the queryset, using the minimum number of queries.

Example:

```
# Get the specific instance of all children of the homepage,
# in a minimum number of database queries.
homepage.get_children().specific()
```

See also: [Page.specific](#)

## Contrib modules

Wagtail ships with a variety of extra optional modules.

### Site settings

You can define settings for your site that are editable by administrators in the Wagtail admin. These settings can be accessed in code, as well as in templates.

To use these settings, you must add `wagtail.contrib.settings` to your `INSTALLED_APPS`:

```
INSTALLED_APPS += [
    'wagtail.contrib.settings',
]
```

### Defining settings

Create a model that inherits from `BaseSetting`, and register it using the `register_setting` decorator:

```
from wagtail.contrib.settings.models import BaseSetting, register_setting

@register_setting
class SocialMediaSettings(BaseSetting):
    facebook = models.URLField(
        help_text='Your Facebook page URL')
    instagram = models.CharField(
        max_length=255, help_text='Your Instagram username, without the @')
    trip_advisor = models.URLField(
        help_text='Your Trip Advisor page URL')
    youtube = models.URLField(
        help_text='Your YouTube channel or user account URL')
```

A ‘Social media settings’ link will appear in the Wagtail admin ‘Settings’ menu.

**Edit handlers** Settings use edit handlers much like the rest of Wagtail. Add a `panels` setting to your model defining all the edit handlers required:

```
@register_setting
class ImportantPages(BaseSetting):
    donate_page = models.ForeignKey(
        'wagtailcore.Page', null=True, on_delete=models.SET_NULL)
    sign_up_page = models.ForeignKey(
        'wagtailcore.Page', null=True, on_delete=models.SET_NULL)

    panels = [
        PageChooserPanel('donate_page'),
        PageChooserPanel('sign_up_page'),
    ]
```

**Appearance** You can change the label used in the menu by changing the `verbose_name` of your model.

You can add an icon to the menu by passing an ‘icon’ argument to the `register_setting` decorator:

```
@register_setting(icon='placeholder')
class SocialMediaSettings(BaseSetting):
    class Meta:
        verbose_name = 'social media accounts'
    ...
```

For a list of all available icons, please see the [UI Styleguide](#).

## Using the settings

Settings are designed to be used both in Python code, and in templates.

**Using in Python** If access to a setting is required in the code, the `for_site()` method will retrieve the setting for the supplied site:

```
def view(request):
    social_media_settings = SocialMediaSettings.for_site(request.site)
    ...
```

**Using in Django templates** Add the `settings` context processor to your settings:

```
TEMPLATES = [
    {
        ...
        'OPTIONS': {
            'context_processors': [
                ...
                'wagtail.contrib.settings.context_processors.settings',
            ]
        }
    }
]
```

Then access the settings through `{% settings %}`:

```
{% settings.app_label.SocialMediaSettings.instagram %}
```

---

**Note:** Replace `app_label` with the label of the app containing your settings model.

---

If you are not in a `RequestContext`, then context processors will not have run, and the `settings` variable will not be available. To get the `settings`, use the provided `{% get_settings %}` template tag. If a `request` is in the template context, but for some reason it is not a `RequestContext`, just use `{% get_settings %}`:

```
{% load wagtailsettings_tags %}
{% get_settings %}
{{ settings.app_label.SocialMediaSettings.instagram }}
```

If there is no `request` available in the template at all, you can use the settings for the default Wagtail site instead:

```
{% load wagtailsettings_tags %}
{% get_settings use_default_site=True %}
{{ settings.app_label.SocialMediaSettings.instagram }}
```

---

**Note:** You can not reliably get the correct settings instance for the current site from this template tag if the `request` object is not available. This is only relevant for multisite instances of Wagtail.

---

**Using in Jinja2 templates** Add `wagtail.contrib.settings.jinja2tags.settings` extension to your Jinja2 settings:

```
TEMPLATES = [
    # ...
    {
        'BACKEND': 'django.template.backends.jinja2.Jinja2',
        'APP_DIRS': True,
        'OPTIONS': {
            'extensions': [
                # ...
                'wagtail.contrib.settings.jinja2tags.settings',
            ],
        },
    }
]
```

Then access the settings through the `settings()` template function:

```
{% settings("app_label.SocialMediaSettings").twitter %}
```

---

**Note:** Replace `app_label` with the label of the app containing your settings model.

---

This will look for a `request` variable in the template context, and find the correct site to use from that. If for some reason you do not have a `request` available, you can instead use the settings defined for the default site:

```
{% settings("app_label.SocialMediaSettings", use_default_site=True).instagram %}
```

You can store the settings instance in a variable to save some typing, if you have to use multiple values from one model:

```
{% with social_settings=settings("app_label.SocialMediaSettings") %}
    Follow us on Twitter at @{{ social_settings.twitter }},
    or Instagram at @{{ social_settings.Instagram }}.
{% endwith %}
```

Or, alternately, using the `set` tag:

```
{% set social_settings=settings("app_label.SocialMediaSettings") %}
```

## Form builder

The `wagtailforms` module allows you to set up single-page forms, such as a ‘Contact us’ form, as pages of a Wagtail site. It provides a set of base models that site implementers can extend to create their own `FormPage` type with their own site-specific templates. Once a page type has been set up in this way, editors can build forms within the usual page editor, consisting of any number of fields. Form submissions are stored for later retrieval through a new ‘Forms’ section within the Wagtail admin interface; in addition, they can be optionally e-mailed to an address specified by the editor.

### Usage

Add `wagtail.wagtailforms` to your `INSTALLED_APPS`:

```
INSTALLED_APPS = [
    ...
    'wagtail.wagtailforms',
]
```

Within the `models.py` of one of your apps, create a model that extends `wagtailforms.models.AbstractEmailForm`:

```
from modelcluster.fields import ParentalKey
from wagtail.wagtailadmin.edit_handlers import (FieldPanel, FieldRowPanel,
    InlinePanel, MultiFieldPanel)
from wagtail.wagtailcore.fields import RichTextField
from wagtail.wagtailforms.models import AbstractEmailForm, AbstractFormField

class FormField(AbstractFormField):
    page = ParentalKey('FormPage', related_name='form_fields')

class FormPage(AbstractEmailForm):
    intro = RichTextField(blank=True)
    thank_you_text = RichTextField(blank=True)

    content_panels = AbstractEmailForm.content_panels + [
        FieldPanel('intro', classname="full"),
        InlinePanel('form_fields', label="Form fields"),
        FieldPanel('thank_you_text', classname="full"),
        MultiFieldPanel([
            FieldRowPanel([
                FieldPanel('from_address', classname="col6"),
                FieldPanel('to_address', classname="col6"),
            ]),
            FieldPanel('subject'),
        ], "Email"),
    ]
```

`AbstractEmailForm` defines the fields `to_address`, `from_address` and `subject`, and expects `form_fields` to be defined. Any additional fields are treated as ordinary page content - note that `FormPage` is responsible for serving both the form page itself and the landing page after submission, so the model definition should include all necessary content fields for both of those views.

If you do not want your form page type to offer form-to-email functionality, you can inherit from `AbstractForm` instead of `AbstractEmailForm`, and omit the `to_address`, `from_address` and `subject` fields from the `content_panels` definition.

You now need to create two templates named `form_page.html` and `form_page_landing.html` (where `form_page` is the underscore-formatted version of the class name). `form_page.html` differs from a standard Wagtail template in that it is passed a variable `form`, containing a Django Form object, in addition to the usual `page` variable. A very basic template for the form would thus be:

```
{% load wagtailcore_tags %}

<html>
  <head>
    <title>{{ page.title }}</title>
  </head>
  <body>
    <h1>{{ page.title }}</h1>
    {{ page.intro|richtext }}
    <form action="{% pageurl page %}" method="POST">
      {% csrf_token %}
      {{ form.as_p }}
      <input type="submit">
    </form>
  </body>
</html>
```

`form_page_landing.html` is a regular Wagtail template, displayed after the user makes a successful form submission.

### Displaying form submission information

`FormSubmissionsPanel` can be added to your page's panel definitions to display the number of form submissions and the time of the most recent submission, along with a quick link to access the full submission data:

```
from wagtail.wagtailforms.edit_handlers import FormSubmissionsPanel

class FormPage(AbstractEmailForm):
    # ...

    content_panels = AbstractEmailForm.content_panels + [
        FormSubmissionsPanel(),
        FieldPanel('intro', classname="full"),
        # ...
    ]
```

### Static site generator

**Warning:** `django-medusa` is no longer maintained, and is incompatible with Django 1.8 and above; the information below is retained for historical reference only. An alternative module based on the `django-bakery` package is available as a third-party contribution: <https://github.com/mhnbcu/wagtailbakery>

This document describes how to render your Wagtail site into static HTML files on your local file system, Amazon S3 or Google App Engine, using `django medusa` and the `wagtail.contrib.wagtailmedusa` module.

### Installing django-medusa

First, install `django-medusa` and `django-sendfile` from pip:

```
pip install django-medusa django-sendfile
```

Then add `django_medusa` and `wagtail.contrib.wagtailmedusa` to `INSTALLED_APPS`:

```
INSTALLED_APPS = [
    ...
    'django_medusa',
    'wagtail.contrib.wagtailmedusa',
]
```

Define `MEDUSA_RENDERER_CLASS`, `MEDUSA_DEPLOY_DIR` and `SENDFILE_BACKEND` in settings:

```
MEDUSA_RENDERER_CLASS = 'django_medusa.renderers.DiskStaticSiteRenderer'
MEDUSA_DEPLOY_DIR = os.path.join(BASE_DIR, 'build')
SENDFILE_BACKEND = 'sendfile.backends.simple'
```

### Rendering

To render a site, run `./manage.py staticsitegen`. This will render the entire website and place the HTML in a folder called `medusa_output`. The static and media folders need to be copied into this folder manually after the rendering is complete. This feature inherits `django-medusa`'s ability to render your static site to Amazon S3 or Google App Engine; see the [medusa docs](#) for configuration details.

To test, open the `medusa_output` folder in a terminal and run `python -m SimpleHTTPServer` or `python3 -m http.server` respectively.

### Advanced topics

**GET parameters** Pages which require GET parameters (e.g. for pagination) don't generate a suitable file name for the generated HTML files.

Wagtail provides a mixin (`wagtail.contrib.wagtailroutablepage.models.RoutablePageMixin`) which allows you to embed a Django URL configuration into a page. This allows you to give the subpages a URL like `/page/1/` which work well with static site generation.

Example:

```
from wagtail.contrib.wagtailroutablepage.models import RoutablePageMixin, route

class BlogIndex(Page, RoutablePageMixin):
    ...

    @route(r'^$', name='main')
    @route(r'^page/(?P<page>\d+)/$', name='page')
    def serve_page(self, request, page=1):
        ...
```

Then in the template, you can use the `{% routablepageurl %}` tag to link between the pages:

```
{% load wagtailroutablepage_tags %}

{% if results.has_previous %}
    <a href="{% routablepageurl page 'page' results.previous_page_number %}">Previous page</a>
{% else %}

{% if results.has_next %}
    <a href="{% routablepageurl page 'page' results.next_page_number %}">Next page</a>
{% else %}

```

Next, you have to tell the `wagtailmedusa` module about your custom routing...

**Rendering pages which use custom routing** For page types that override the `route` method, we need to let `django-medusa` know which URLs it responds on. This is done by overriding the `get_static_site_paths` method to make it yield one string per URL path.

For example, the `BlogIndex` above would need to yield one URL for each page of results:

```
def get_static_site_paths(self):
    # Get page count
    page_count = ...

    # Yield a path for each page
    for page in range(page_count):
        yield '/%d/' % (page + 1)

    # Yield from superclass
    for path in super(BlogIndex, self).get_static_site_paths():
        yield path
```

## Sitemap generator

This document describes how to create XML sitemaps for your Wagtail website using the `wagtail.contrib.wagtailsitemaps` module.

### Basic configuration

You firstly need to add "`wagtail.contrib.wagtailsitemaps`" to `INSTALLED_APPS` in your Django settings file:

```
INSTALLED_APPS = [
    ...
    "wagtail.contrib.wagtailsitemaps",
]
```

Then, in `urls.py`, you need to add a link to the `wagtail.contrib.wagtailsitemaps.views.sitemap` view which generates the sitemap:

```
from wagtail.contrib.wagtailsitemaps.views import sitemap

urlpatterns = [
    ...
    url('^sitemap\.xml$', sitemap),
]
```

You should now be able to browse to `/sitemap.xml` and see the sitemap working. By default, all published pages in your website will be added to the site map.

### Setting the hostname

By default, the sitemap uses the hostname defined in the Wagtail Admin's `Sites` area. If your default site is called `localhost`, then URLs in the sitemap will look like:

```
<url>
  <loc>http://localhost/about/</loc>
  <lastmod>2015-09-26</lastmod>
</url>
```

For tools like Google Search Tools to properly index your site, you need to set a valid, crawlable hostname. If you change the site's hostname from `localhost` to `mysite.com`, `sitemap.xml` will contain the correct URLs:

```
<url>
  <loc>http://mysite.com/about/</loc>
  <lastmod>2015-09-26</lastmod>
</url>
```

Find out more about [working with Sites](#).

### Customising

**URLs** The `Page` class defines a `get_sitemap_urls` method which you can override to customise sitemaps per `Page` instance. This method must return a list of dictionaries, one dictionary per URL entry in the sitemap. You can exclude pages from the sitemap by returning an empty list.

Each dictionary can contain the following:

- **location** (required) - This is the full URL path to add into the sitemap.
- **lastmod** - A python date or datetime set to when the page was last modified.
- **changefreq**
- **priority**

You can add more but you will need to override the `wagtailsitemaps/sitemap.xml` template in order for them to be displayed in the sitemap.

**Cache** By default, sitemaps are cached for 100 minutes. You can change this by setting `WAGTAILSITEMAPS_CACHE_TIMEOUT` in your Django settings to the number of seconds you would like the cache to last for.

### Frontend cache invalidator

Changed in version 0.7: Multiple backend support added Cloudflare support added

Changed in version 1.7: Amazon CloudFront support added

Many websites use a frontend cache such as Varnish, Squid, Cloudflare or CloudFront to gain extra performance. The downside of using a frontend cache though is that they don't respond well to updating content and will often keep an old version of a page cached after it has been updated.

This document describes how to configure Wagtail to purge old versions of pages from a frontend cache whenever a page gets updated.

### Setting it up

Firstly, add "wagtail.contrib.wagtailfrontendcache" to your INSTALLED\_APPS:

```
• INSTALLED_APPS = [
    ...
    "wagtail.contrib.wagtailfrontendcache"
]
```

Changed in version 0.8: Signal handlers are now automatically registered

The wagtailfrontendcache module provides a set of signal handlers which will automatically purge the cache whenever a page is published or deleted. These signal handlers are automatically registered when the wagtail.contrib.wagtailfrontendcache app is loaded.

**Varnish/Squid** Add a new item into the WAGTAILFRONTENDCACHE setting and set the BACKEND parameter to wagtail.contrib.wagtailfrontendcache.backends.HTTPBackend. This backend requires an extra parameter LOCATION which points to where the cache is running (this must be a direct connection to the server and cannot go through another proxy).

```
# settings.py

WAGTAILFRONTENDCACHE = {
    'varnish': {
        'BACKEND': 'wagtail.contrib.wagtailfrontendcache.backends.HTTPBackend',
        'LOCATION': 'http://localhost:8000',
    },
}
```

Finally, make sure you have configured your frontend cache to accept PURGE requests:

- Varnish
- Squid

**Cloudflare** Firstly, you need to register an account with Cloudflare if you haven't already got one. You can do this here: [Cloudflare Sign up](#)

Add an item into the WAGTAILFRONTENDCACHE and set the BACKEND parameter to wagtail.contrib.wagtailfrontendcache.backends.CloudflareBackend. This backend requires two extra parameters, EMAIL (your Cloudflare account email) and TOKEN (your API token from Cloudflare).

```
# settings.py

WAGTAILFRONTENDCACHE = {
    'cloudflare': {
        'BACKEND': 'wagtail.contrib.wagtailfrontendcache.backends.CloudflareBackend',
        'EMAIL': 'your-cloudflare-email-address@example.com',
        'TOKEN': 'your cloudflare api token',
    },
}
```

**Amazon CloudFront** Within Amazon Web Services you will need at least one CloudFront web distribution. If you don't have one, you can get one here: [CloudFront getting started](#)

Add an item into the `WAGTAILFRONTENDCACHE` and set the `BACKEND` parameter to `wagtail.contrib.wagtailfrontendcache.backends.CloudfrontBackend`. This backend requires one extra parameter, `DISTRIBUTION_ID` (your CloudFront generated distribution id).

```
WAGTAILFRONTENDCACHE = {
    'cloudfront': {
        'BACKEND': 'wagtail.contrib.wagtailfrontendcache.backends.CloudfrontBackend',
        'DISTRIBUTION_ID': 'your-distribution-id',
    },
}
```

Configuration of credentials can done in multiple ways. You won't need to store them in your Django settings file. You can read more about this here: [Boto 3 Docs](#)

In case you run multiple sites with Wagtail and each site has its CloudFront distribution, provide a mapping instead of a single distribution. Make sure the mapping matches with the hostnames provided in your site settings.

```
WAGTAILFRONTENDCACHE = {
    'cloudfront': {
        'BACKEND': 'wagtail.contrib.wagtailfrontendcache.backends.CloudfrontBackend',
        'DISTRIBUTION_ID': {
            'www.wagtail.io': 'your-distribution-id',
            'www.madewithwagtail.org': 'your-distribution-id',
        },
    },
}

... note::
In most cases, absolute URLs with ``www`` prefixed domain names should be used in your mapping. On
```

## Advanced usage

**Invalidating more than one URL per page** By default, Wagtail will only purge one URL per page. If your page has more than one URL to be purged, you will need to override the `get_cached_paths` method on your page type.

```
class BlogIndexPage(Page):
    def get_blog_items(self):
        # This returns a Django paginator of blog items in this section
        return Paginator(self.get_children().live().type(BlogPage), 10)

    def get_cached_paths(self):
        # Yield the main URL
        yield '/'

        # Yield one URL per page in the paginator to make sure all pages are purged
        for page_number in range(1, self.get_blog_items().num_pages + 1):
            yield '/?page=' + str(page_number)
```

**Invalidating index pages** Another problem is pages that list other pages (such as a blog index) will not be purged when a blog entry gets added, changed or deleted. You may want to purge the blog index page so the updates are added into the listing quickly.

This can be solved by using the `purge_page_from_cache` utility function which can be found in the `wagtail.contrib.wagtailfrontendcache.utils` module.

Let's take the the above BlogIndexPage as an example. We need to register a signal handler to run when one of the BlogPages get updated/deleted. This signal handler should call the `purge_page_from_cache` function on all BlogIndexPages that contain the BlogPage being updated/deleted.

```
# models.py
from django.dispatch import receiver
from django.db.models.signals import pre_delete

from wagtail.wagtailcore.signals import page_published
from wagtail.contrib.wagtailfrontendcache.utils import purge_page_from_cache

...

def blog_page_changed(blog_page):
    # Find all the live BlogIndexPages that contain this blog_page
    for blog_index in BlogIndexPage.objects.live():
        if blog_page in blog_index.get_blog_items().object_list:
            # Purge this blog index
            purge_page_from_cache(blog_index)

@receiver(page_published, sender=BlogPage):
def blog_published_handler(instance):
    blog_page_changed(instance)

@receiver(pre_delete, sender=BlogPage)
def blog_deleted_handler(instance):
    blog_page_changed(instance)
```

**InValidating individual URLs** `wagtail.contrib.wagtailfrontendcache.utils` provides another function called `purge_url_from_cache`. As the name suggests, this purges an individual URL from the cache.

For example, this could be useful for purging a single page of blogs:

```
from wagtail.contrib.wagtailfrontendcache.utils import purge_url_from_cache

# Purge the first page of the blog index
purge_url_from_cache(blog_index.url + '?page=1')
```

### RoutablePageMixin

The `RoutablePageMixin` mixin provides a convenient way for a page to respond on multiple sub-URLs with different views. For example, a blog section on a site might provide several different types of index page at URLs like `/blog/2013/06/`, `/blog/authors/bob/`, `/blog/tagged/python/`, all served by the same page instance.

A Page using `RoutablePageMixin` exists within the page tree like any other page, but URL paths underneath it are checked against a list of patterns. If none of the patterns match, control is passed to subpages as usual (or failing that, a 404 error is thrown).

## The basics

To use `RoutablePageMixin`, you need to make your class inherit from both `wagtail.contrib.wagtailroutablepage.models.RoutablePageMixin` and `wagtail.wagtailcore.models.Page`, then define some view methods and decorate them with `wagtail.contrib.wagtailroutablepage.models.route`.

Here's an example of an `EventPage` with three views:

```
from wagtail.wagtailcore.models import Page
from wagtail.contrib.wagtailroutablepage.models import RoutablePageMixin, route


class EventPage(RoutablePageMixin, Page):
    ...

    @route(r'^$')
    def current_events(self, request):
        """
        View function for the current events page
        """
        ...

    @route(r'^past/$')
    def past_events(self, request):
        """
        View function for the past events page
        """
        ...

    # Multiple routes!
    @route(r'^year/(\d+)/$')
    @route(r'^year/current/$')
    def events_for_year(self, request, year=None):
        """
        View function for the events for year page
        """
        ...

    ...

```

## Reversing URLs

`RoutablePageMixin` adds a `reverse_subpage()` method to your page model which you can use for reversing URLs. For example:

```
# The URL name defaults to the view method name.
>>> event_page.reverse_subpage('events_for_year', args=(2015, ))
'year/2015/'
```

This method only returns the part of the URL within the page. To get the full URL, you must append it to the values of either the `url` or the `full_url` attribute on your page:

```
>>> event_page.url + event_page.reverse_subpage('events_for_year', args=(2015, ))
'/events/year/2015/'

>>> event_page.full_url + event_page.reverse_subpage('events_for_year', args=(2015, ))
'http://example.com/events/year/2015/'
```

**Changing route names** The route name defaults to the name of the view. You can override this name with the `name` keyword argument on `@route`:

```
from wagtail.wagtailcore.models import Page
from wagtail.contrib.wagtailroutablepage.models import RoutablePageMixin, route

class EventPage(RoutablePageMixin, Page):
    ...

    @route(r'^year/(\d+)/$', name='year')
    def events_for_year(self, request, year):
        """
        View function for the events for year page
        """
    ...

>>> event_page.reverse_subpage('year', args=(2015, ))
'/events/year/2015/'
```

### The `RoutablePageMixin` class

`class wagtail.contrib.wagtailroutablepage.models.RoutablePageMixin`

This class can be mixed in to a Page model, allowing extra routes to be added to it.

`classmethod get_subpage_urls()`

`resolve_subpage(path)`

This method takes a URL path and finds the view to call.

Example:

```
view, args, kwargs = page.resolve_subpage('/past/')
response = view(request, *args, **kwargs)
```

`reverse_subpage(name, args=None, kwargs=None)`

This method takes a route name/arguments and returns a URL path.

Example:

```
url = page.url + page.reverse_subpage('events_for_year', kwargs={'year': '2014'})
```

### The `routablepageurl` template tag

`wagtail.contrib.wagtailroutablepage.templatetags.wagtailroutablepage_tags.routablepageurl`(

`routablepageurl` is similar to `pageurl`, but works with `RoutablePages`. It behaves like a hybrid between the built-in `reverse`, and `pageurl` from Wagtail.

`page` is the `RoutablePage` that URLs will be generated from.

`url_name` is a URL name defined in `page.subpage_urls`.

Positional arguments and keyword arguments should be passed as normal positional arguments and keyword arguments.

Example:

```
{% load wagtailroutablepage_tags %}

{% routablepageurl page "feed" %}
{% routablepageurl page "archive" 2014 08 14 %}
{% routablepageurl page "food" foo="bar" baz="quux" %}
```

## Wagtail API

The `wagtailapi` module can be used to create a read-only, JSON-based API for public Wagtail content.

There are three endpoints to the API:

- **Pages:** `/api/v1/pages/`
- **Images:** `/api/v1/images/`
- **Documents:** `/api/v1/documents/`

See [Wagtail API Installation](#) and [Wagtail API Configuration](#) if you're looking to add this module to your Wagtail site.

See [Wagtail API Usage Guide](#) for documentation on the API.

## Index

**Wagtail API Installation** To install, add `wagtail.contrib.wagtailapi` and `rest_framework` to `INSTALLED_APPS` in your Django settings and configure a URL for it in `urls.py`:

```
# settings.py

INSTALLED_APPS = [
    ...
    'wagtail.contrib.wagtailapi',
    'rest_framework',
]

# urls.py

from wagtail.contrib.wagtailapi import urls as wagtailapi_urls

urlpatterns = [
    ...
    url(r'^api/', include(wagtailapi_urls)),
]
```

## Wagtail API Configuration

**Settings** `WAGTAILAPI_BASE_URL` (required when using frontend cache invalidation)

This is used in two places, when generating absolute URLs to document files and invalidating the cache.

Generating URLs to documents will fall back the the current request's hostname if this is not set. Cache invalidation cannot do this, however, so this setting must be set when using this module alongside the `wagtailfrontendcache` module.

WAGTAILAPI\_SEARCH\_ENABLED (default: True)

Setting this to false will disable full text search. This applies to all endpoints.

WAGTAILAPI\_LIMIT\_MAX (default: 20)

This allows you to change the maximum number of results a user can request at a time. This applies to all endpoints.

**Adding more fields to the pages endpoint** By default, the pages endpoint only includes the `id`, `title` and `type` fields in both the listing and detail views.

You can add more fields to the pages endpoint by setting an attribute called `api_fields` to a list of field names:

```
class BlogPage(Page):
    posted_by = models.CharField()
    posted_at = models.DateTimeField()
    content = RichTextField()

    api_fields = ['posted_by', 'posted_at', 'content']
```

This list also supports child relations (which will be nested inside the returned JSON document):

```
class BlogPageRelatedLink(Orderable):
    page = ParentalKey('BlogPage', related_name='related_links')
    link = models.URLField()

    api_fields = ['link']

class BlogPage(Page):
    posted_by = models.CharField()
    posted_at = models.DateTimeField()
    content = RichTextField()

    api_fields = ['posted_by', 'posted_at', 'content', 'related_links']
```

**Frontend cache invalidation** If you have a Varnish, Squid, Cloudflare or CloudFront instance in front of your API, the `wagtailapi` module can automatically invalidate cached responses for you whenever they are updated in the database.

To enable it, firstly configure the `wagtail.contrib.wagtailfrontendcache` module within your project (see [Wagtail frontend cache docs]([http://docs.wagtail.io/en/latest/contrib\\_components/frontendcache.html](http://docs.wagtail.io/en/latest/contrib_components/frontendcache.html)) for more information).

Then make sure that the `WAGTAILAPI_BASE_URL` setting is set correctly (Example: `WAGTAILAPI_BASE_URL = 'http://api.mysite.com'`).

Then finally, switch it on by setting `WAGTAILAPI_USE_FRONTENDCACHE` to `True`.

## Wagtail API Usage Guide

**Listing views** Performing a GET request against one of the endpoints will get you a listing of objects in that endpoint. The response will look something like this:

```
GET /api/v1/endpoint_name/
```

```
HTTP 200 OK
```

```
Content-Type: application/json
```

```
{
    "meta": {
        "total_count": "total number of results"
    },
    "endpoint_name": [
        {
            "id": 1,
            "meta": {
                "type": "app_name.ModelName",
                "detail_url": "http://api.example.com/api/v1/endpoint_name/1/"
            },
            "field": "value"
        },
        {
            "id": 2,
            "meta": {
                "type": "app_name.ModelName",
                "detail_url": "http://api.example.com/api/v1/endpoint_name/2/"
            },
            "field": "different value"
        }
    ]
}
```

This is the basic structure of all of the listing views. They all have a `meta` section with a `total_count` variable and a listing of things.

**Detail views** All of the endpoints also contain a “detail” view which returns information on an individual object. This view is always accessed by appending the id of the object to the URL.

**The `pages` endpoint** This endpoint includes all live pages in your site that have not been put in a private section.

**The listing view (`/api/v1/pages/`)** This is what a typical response from a GET request to this listing would look like:

```
GET /api/v1/pages/
HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 2
    },
    "pages": [
        {
            "id": 2,
            "meta": {
                "type": "demo.HomePage",
                "detail_url": "http://api.example.com/api/v1/pages/2/"
            },
            "title": "Homepage"
        },
        {
            "id": 3,
```

```
        "meta": {
            "type": "demo.BlogIndexPage",
            "detail_url": "http://api.example.com/api/v1/pages/3/"
        },
        "title": "Blog"
    }
}
```

Each page object contains the `id`, a `meta` section and the fields with their values.

**meta** This section is used to hold “metadata” fields which aren’t fields in the database. Wagtail API adds two by default:

- `type` - The app label/model name of the object
- `detail_url` - A URL linking to the detail view for this object

**Selecting a page type** Most Wagtail sites are made up of multiple different types of page that each have their own specific fields. In order to view/filter/order on fields specific to one page type, you must select that page type using the `type` query parameter.

The `type` query parameter must be set to the Pages model name in the format: `app_label.ModelName`.

```
GET /api/v1/pages/?type=demo.BlogPage

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 3
    },
    "pages": [
        {
            "id": 4,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/4/"
            },
            "title": "My blog 1"
        },
        {
            "id": 5,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/5/"
            },
            "title": "My blog 2"
        },
        {
            "id": 6,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/6/"
            },
            "title": "My blog 3"
        }
    ]
}
```

```
        ]
    }
```

**Specifying a list of fields to return** As you can see, we still only get the `title` field, even though we have selected a type. That's because listing pages require you to explicitly tell it what extra fields you would like to see. You can do this with the `fields` query parameter.

Just set `fields` to a command-separated list of field names that you would like to use.

```
GET /api/v1/pages/?type=demo.BlogPage&fields=title,date_posted,feed_image

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 3
    },
    "pages": [
        {
            "id": 4,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/4/"
            },
            "title": "My blog 1",
            "date_posted": "2015-01-23",
            "feed_image": {
                "id": 1,
                "meta": {
                    "type": "wagtailimages.Image",
                    "detail_url": "http://api.example.com/api/v1/images/1/"
                }
            }
        },
        {
            "id": 5,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/5/"
            },
            "title": "My blog 2",
            "date_posted": "2015-01-24",
            "feed_image": {
                "id": 2,
                "meta": {
                    "type": "wagtailimages.Image",
                    "detail_url": "http://api.example.com/api/v1/images/2/"
                }
            }
        },
        {
            "id": 6,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/6/"
            }
        }
    ]
}
```

```
        "title": "My blog 3",
        "date_posted": "2015-01-25",
        "feed_image": {
            "id": 3,
            "meta": {
                "type": "wagtailimages.Image",
                "detail_url": "http://api.example.com/api/v1/images/3/"
            }
        }
    ]
}
```

We now have enough information to make a basic blog listing with a feed image and date that the blog was posted.

**Filtering on fields** Exact matches on field values can be done by using a query parameter with the same name as the field. Any pages with the field that exactly matches the value of this parameter will be returned.

```
GET /api/v1/pages/?type=demo.BlogPage&fields=title,date_posted&date_posted=2015-01-24

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 1
    },
    "pages": [
        {
            "id": 5,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/5/"
            },
            "title": "My blog 2",
            "date_posted": "2015-01-24",
        }
    ]
}
```

**Filtering by section of the tree** It is also possible to filter the listing to only include pages with a particular parent or ancestor. This is useful if you have multiple blogs on your site and only want to view the contents of one of them.

#### **child\_of**

Filters the listing to only include direct children of the specified page.

For example, to get all the pages that are direct children of page 7.

```
GET /api/v1/pages/?child_of=7

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 1
    }
}
```

```

},
"pages": [
{
    "id": 4,
    "meta": {
        "type": "demo.BlogPage",
        "detail_url": "http://api.example.com/api/v1/pages/4/"
    },
    "title": "Other blog 1"
}
]
}

```

**descendant\_of**

New in version 1.1.

Filters the listing to only include descendants of the specified page.

For example, to get all pages underneath the homepage:

```

GET /api/v1/pages/?descendant_of=2

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 1
    },
    "pages": [
        {
            "id": 3,
            "meta": {
                "type": "demo.BlogIndexPage",
                "detail_url": "http://api.example.com/api/v1/pages/3/"
            },
            "title": "Blog"
        },
        {
            "id": 4,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/4/"
            },
            "title": "My blog 1",
        },
        {
            "id": 5,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/5/"
            },
            "title": "My blog 2",
        },
        {
            "id": 6,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/6/"
            }
        }
    ]
}

```

```
        },
        "title": "My blog 3",
    }
]
}
```

**Ordering** Like filtering, it is also possible to order on database fields. The endpoint accepts a query parameter called `order` which should be set to the field name to order by. Field names can be prefixed with a `-` to reverse the ordering. It is also possible to order randomly by setting this parameter to `random`.

```
GET /api/v1/pages/?type=demo.BlogPage&fields=title,date_posted,feed_image&order=-date_posted
```

HTTP 200 OK  
Content-Type: application/json

```
{
    "meta": {
        "total_count": 3
    },
    "pages": [
        {
            "id": 6,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/6/"
            },
            "title": "My blog 3",
            "date_posted": "2015-01-25",
            "feed_image": {
                "id": 3,
                "meta": {
                    "type": "wagtailimages.Image",
                    "detail_url": "http://api.example.com/api/v1/images/3/"
                }
            }
        },
        {
            "id": 5,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/5/"
            },
            "title": "My blog 2",
            "date_posted": "2015-01-24",
            "feed_image": {
                "id": 2,
                "meta": {
                    "type": "wagtailimages.Image",
                    "detail_url": "http://api.example.com/api/v1/images/2/"
                }
            }
        },
        {
            "id": 4,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/4/"
            }
        }
    ]
}
```

```

        },
        "title": "My blog 1",
        "date_posted": "2015-01-23",
        "feed_image": {
            "id": 1,
            "meta": {
                "type": "wagtailimages.Image",
                "detail_url": "http://api.example.com/api/v1/images/1/"
            }
        }
    ]
}

```

**Pagination** Pagination is done using two query parameters called `limit` and `offset`. `limit` sets the number of results to return and `offset` is the index of the first result to return. The default and maximum value for `limit` is 20. The maximum value can be changed using the `WAGTAILAPI_LIMIT_MAX` setting.

```
GET /api/v1/pages/?limit=1&offset=1

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 2
    },
    "pages": [
        {
            "id": 3,
            "meta": {
                "type": "demo.BlogIndexPage",
                "detail_url": "http://api.example.com/api/v1/pages/3/"
            },
            "title": "Blog"
        }
    ]
}
```

Pagination will not change the `total_count` value in the meta.

**Searching** To perform a full-text search, set the `search` parameter to the query string you would like to search on.

```
GET /api/v1/pages/?search=Blog

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 3
    },
    "pages": [
        {
            "id": 3,
            "meta": {
                "type": "demo.BlogIndexPage",

```

```
        "detail_url": "http://api.example.com/api/v1/pages/3/"
    },
    "title": "Blog"
},
{
    "id": 4,
    "meta": {
        "type": "demo.BlogPage",
        "detail_url": "http://api.example.com/api/v1/pages/4/"
    },
    "title": "My blog 1",
},
{
    "id": 5,
    "meta": {
        "type": "demo.BlogPage",
        "detail_url": "http://api.example.com/api/v1/pages/5/"
    },
    "title": "My blog 2",
},
{
    "id": 6,
    "meta": {
        "type": "demo.BlogPage",
        "detail_url": "http://api.example.com/api/v1/pages/6/"
    },
    "title": "My blog 3",
}
]
```

The results are ordered by relevance. It is not possible to use the `order` parameter with a search query.

If your Wagtail site is using Elasticsearch, you do not need to select a type to access specific fields. This will search anything that's defined in the models' `search_fields`.

**The detail view (`/api/v1/pages/{id}/`)** This view gives you access to all of the details for a particular page.

```
GET /api/v1/pages/6/
HTTP 200 OK
Content-Type: application/json

{
    "id": 6,
    "meta": {
        "type": "demo.BlogPage",
        "detail_url": "http://api.example.com/api/v1/pages/6/"
    },
    "parent": {
        "id": 3,
        "meta": {
            "type": "demo.BlogIndexPage",
            "detail_url": "http://api.example.com/api/v1/pages/3/"
        }
    },
    "title": "My blog 3",
    "date_posted": "2015-01-25",
```

```

"feed_image": {
    "id": 3,
    "meta": {
        "type": "wagtailimages.Image",
        "detail_url": "http://api.example.com/api/v1/images/3/"
    }
},
"related_links": [
    {
        "title": "Other blog page",
        "page": {
            "id": 5,
            "meta": {
                "type": "demo.BlogPage",
                "detail_url": "http://api.example.com/api/v1/pages/5/"
            }
        }
    }
]
}

```

**The format is the same as that which is returned inside the listing view, with two additions:**

- All of the available fields are added to the detail page by default
- A `parent` field has been included that contains information about the parent page

**The `images` endpoint** This endpoint gives access to all uploaded images. This will use the custom image model if one was specified. Otherwise, it falls back to `wagtailimages.Image`.

**The listing view (`/api/v1/images/`)** This is what a typical response from a GET request to this listing would look like:

```

GET /api/v1/images/

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 3
    },
    "images": [
        {
            "id": 4,
            "meta": {
                "type": "wagtailimages.Image",
                "detail_url": "http://api.example.com/api/v1/images/4/"
            },
            "title": "Wagtail by Mark Harkin"
        },
        {
            "id": 5,
            "meta": {
                "type": "wagtailimages.Image",
                "detail_url": "http://api.example.com/api/v1/images/5/"
            },
        }
    ]
}

```

```
        "title": "James Joyce"
    },
    {
        "id": 6,
        "meta": {
            "type": "wagtailimages.Image",
            "detail_url": "http://api.example.com/api/v1/images/6/"
        },
        "title": "David Mitchell"
    }
]
```

Each image object contains the `id` and `title` of the image.

**Getting `width`, `height` and other fields** Like the pages endpoint, the images endpoint supports the `fields` query parameter.

By default, this will allow you to add the `width` and `height` fields to your results. If your Wagtail site uses a custom image model, it is possible to have more.

```
GET /api/v1/images/?fields=title,width,height

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 3
    },
    "images": [
        {
            "id": 4,
            "meta": {
                "type": "wagtailimages.Image",
                "detail_url": "http://api.example.com/api/v1/images/4/"
            },
            "title": "Wagtail by Mark Harkin",
            "width": 640,
            "height": 427
        },
        {
            "id": 5,
            "meta": {
                "type": "wagtailimages.Image",
                "detail_url": "http://api.example.com/api/v1/images/5/"
            },
            "title": "James Joyce",
            "width": 500,
            "height": 392
        },
        {
            "id": 6,
            "meta": {
                "type": "wagtailimages.Image",
                "detail_url": "http://api.example.com/api/v1/images/6/"
            },
            "title": "David Mitchell",
```

```

        "width": 360,
        "height": 282
    }
]
}
}
```

**Filtering on fields** Exact matches on field values can be done by using a query parameter with the same name as the field. Any images with the field that exactly matches the value of this parameter will be returned.

```
GET /api/v1/pages/?title=James Joyce

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 3
    },
    "images": [
        {
            "id": 5,
            "meta": {
                "type": "wagtailimages.Image",
                "detail_url": "http://api.example.com/api/v1/images/5/"
            },
            "title": "James Joyce"
        }
    ]
}
```

**Ordering** The images endpoint also accepts the `order` parameter which should be set to a field name to order by. Field names can be prefixed with a `-` to reverse the ordering. It is also possible to order randomly by setting this parameter to `random`.

```
GET /api/v1/images/?fields=title,width&order=width

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 3
    },
    "images": [
        {
            "id": 6,
            "meta": {
                "type": "wagtailimages.Image",
                "detail_url": "http://api.example.com/api/v1/images/6/"
            },
            "title": "David Mitchell",
            "width": 360
        },
        {
            "id": 5,
            "meta": {

```

```
        "type": "wagtailimages.Image",
        "detail_url": "http://api.example.com/api/v1/images/5/"
    },
    "title": "James Joyce",
    "width": 500
},
{
    "id": 4,
    "meta": {
        "type": "wagtailimages.Image",
        "detail_url": "http://api.example.com/api/v1/images/4/"
    },
    "title": "Wagtail by Mark Harkin",
    "width": 640
}
]
```

**Pagination** Pagination is done using two query parameters called `limit` and `offset`. `limit` sets the number of results to return and `offset` is the index of the first result to return. The default and maximum value for `limit` is 20. The maximum value can be changed using the `WAGTAILAPI_LIMIT_MAX` setting.

```
GET /api/v1/images/?limit=1&offset=1

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 3
    },
    "images": [
        {
            "id": 5,
            "meta": {
                "type": "wagtailimages.Image",
                "detail_url": "http://api.example.com/api/v1/images/5/"
            },
            "title": "James Joyce",
            "width": 500,
            "height": 392
        }
    ]
}
```

Pagination will not change the `total_count` value in the meta.

**Searching** To perform a full-text search, set the `search` parameter to the query string you would like to search on.

```
GET /api/v1/images/?search=James

HTTP 200 OK
Content-Type: application/json

{
    "meta": {
        "total_count": 1
```

```

},
"pages": [
{
    "id": 5,
    "meta": {
        "type": "wagtailimages.Image",
        "detail_url": "http://api.example.com/api/v1/images/5/"
    },
    "title": "James Joyce",
    "width": 500,
    "height": 392
}
]
}

```

Like the pages endpoint, the results are ordered by relevance and it is not possible to use the `order` parameter with a search query.

**The detail view (`/api/v1/images/{id}/`)** This view gives you access to all of the details for a particular image.

```

GET /api/v1/images/5/

HTTP 200 OK
Content-Type: application/json

{
    "id": 5,
    "meta": {
        "type": "wagtailimages.Image",
        "detail_url": "http://api.example.com/api/v1/images/5/"
    },
    "title": "James Joyce",
    "width": 500,
    "height": 392
}

```

**The documents endpoint** This endpoint gives access to all uploaded documents.

**The listing view (`/api/v1/documents/`)** The documents listing supports the same features as the images listing (documented above) but works with Documents instead.

**The detail view (`/api/v1/documents/{id}/`)** This view gives you access to all of the details for a particular document.

```

GET /api/v1/documents/1/

HTTP 200 OK
Content-Type: application/json

{
    "id": 1,
    "meta": {
        "type": "wagtaildocs.Document",
        "detail_url": "http://api.example.com/api/v1/documents/1/",
    }
}

```

```
        "download_url": "http://api.example.com/documents/1/usage.md"
    },
    "title": "Wagtail API usage"
}
```

### ModelAdmin

The `modeladmin` module allows you to create customisable listing pages for any model in your Wagtail project, and add navigation elements to the Wagtail admin area so that you can access them. Simply extend the `ModelAdmin` class, override a few attributes to suit your needs, register it with Wagtail using an easy one-line `modeladmin_register` method (you can copy and paste from the examples below), and you're good to go.

You can use it with any Django model (it doesn't need to extend `Page` or be registered as a `Snippet`), and it won't interfere with any of the existing admin functionality that Wagtail provides.

### Summary of features

- A customisable list view, allowing you to control what values are displayed for each row, available options for result filtering, default ordering, and more.
- Access your list views from the Wagtail admin menu easily with automatically generated menu items, with automatic ‘active item’ highlighting. Control the label text and icons used with easy-to-change attributes on your class.
- An additional `ModelAdminGroup` class, that allows you to group your related models, and list them together in their own submenu, for a more logical user experience.
- Simple, robust `add` and `edit` views for your non-`Page` models that use the panel configurations defined on your model using Wagtail’s edit panels.
- For `Page` models, the system directs to Wagtail’s existing add and edit views, and returns you back to the correct list page, for a seamless experience.
- Full respect for permissions assigned to your Wagtail users and groups. Users will only be able to do what you want them to!
- All you need to easily hook your `ModelAdmin` classes into Wagtail, taking care of URL registration, menu changes, and registering any missing model permissions, so that you can assign them to Groups.
- **Built to be customisable** - While `modeladmin` provides a solid experience out of the box, you can easily use your own templates, and the `ModelAdmin` class has a large number of methods that you can override or extend, allowing you to customise the behaviour to a greater degree.

### Want to know more about customising ModelAdmin?

**modeladmin customisation primer** The `modeladmin` app is designed to offer you as much flexibility as possible in how your model and its objects are represented in Wagtail’s CMS. This page aims to provide you with some background information to help you gain a better understanding of what the app can do, and to point you in the right direction, depending on the kind of customisations you’re looking to make.

- Wagtail’s `ModelAdmin` class isn’t the same as Django’s
- Changing what appears in the listing
- Adding additional stylesheets and/or javascript
- Overriding templates
- Overriding views
- Overriding helper classes

**Wagtail’s `ModelAdmin` class isn’t the same as Django’s** Wagtail’s `ModelAdmin` class is designed to be used in a similar way to Django’s class of the same name, and often uses the same attribute and method names to achieve similar things. However, there are a few key differences:

**Add & edit forms are still defined by `panels` and `edit_handlers`** In Wagtail, controlling which fields appear in add/edit forms for your `Model`, and defining how they are grouped and ordered, is achieved by adding a `panels` attribute, or `edit_handler` to your `Model` class. This remains the same whether your model is a `Page` type, a snippet, or just a standard Django `Model`. Because of this, Wagtail’s `ModelAdmin` class is mostly concerned with ‘listing’ configuration. For example, `list_display`, `list_filter` and `search_fields` attributes are present and support largely the same values as Django’s `ModelAdmin` class, while `fields`, `fieldsets`, `exclude` and other attributes you may be used to using to configure Django’s add/edit views, simply aren’t supported by Wagtail’s version.

**‘Page type’ models need to be treated differently to other models** While `modeladmin`’s listing view and its supported customisation options work in exactly the same way for all types of `Model`, when it comes to the other management views, the treatment differs depending on whether your `ModelAdmin` class is representing a page type model (that extends `wagtailcore.models.Page`) or not.

Pages in Wagtail have some unique properties, and require additional views, interface elements and general treatment in order to be managed effectively. For example, they have a tree structure that must be preserved properly as pages are added, deleted and moved around. They also have a revisions system, their own permission considerations, and the facility to preview changes before saving changes. Because of this added complexity Wagtail provides its own specific views for managing any custom page types you might add to your project; whether you create a `ModelAdmin` class for them, or not.

In order to deliver a consistent experience for users, `modeladmin` simply redirects users to Wagtail’s existing page management views wherever possible. You should bear this in mind if you ever find yourself wanting to change what happens when pages of a certain type are added, deleted, published, or have some other action applied to them. Customising the `CreateView` or `EditView` for your a page type `Model` (even it just to add an additional stylesheet or javascript), simply won’t have any effect, as those views are not used.

If you do find yourself needing to customise the add, edit or other behaviour for a page type model, you should take a look at the following part of the documentation: [Hooks](#).

**Wagtail’s `ModelAdmin` class is ‘modular’** Unlike Django’s class of the same name, `wagtailadmin`’s `ModelAdmin` acts primarily as a ‘controller’ class. While it does have a set of attributes and methods to enable you to configure how various components should treat your model, it has been deliberately designed to do as little work as possible by itself; it designates all of the real work to a set of separate, swappable components.

The theory is: If you want to do something differently, or add some functionality that `modeladmin` doesn’t already have, you can create new classes (or extend the ones provided by `modeladmin`) and easily configure your `ModelAdmin` class to use them instead of the defaults.

- Learn more about [Overriding views](#)
- Learn more about [Overriding helper classes](#)

**Changing what appears in the listing** You should familiarise yourself with the attributes and methods supported by the `ModelAdmin` class, that allow you to change what is displayed in the `IndexView`. The following page should give you everything you need to get going: [Customising IndexView - the listing view](#)

**Adding additional stylesheets and/or javascript** The `ModelAdmin` class provides several attributes to enable you to easily add additional stylesheets and javascript to the admin interface for your model. Each attribute simply needs to be a list of paths to the files you want to include. If the path is for a file in your project's static directory, Wagtail will automatically prepend paths for each path with `STATIC_URL`, so you don't need to repeat it each time in your list of paths.

If you'd like to add styles or scripts to the `IndexView`, you should set the following attributes:

- `index_view_extra_css` - Where each item is the path name of a pre-compiled stylesheet that you'd like to include.
- `index_view_extra_js` - Where each item is the path name of a javascript file that you'd like to include.

If you'd like to do the same for `CreateView` and `EditView`, you should set the following attributes:

- `form_view_extra_css` - Where each item is the path name of a pre-compiled stylesheet that you'd like to include.
- `form_view_extra_js` - Where each item is the path name of a javascript file that you'd like to include.

And if you're using the `InspectView` for your model, and want to do the same for that view, you should set the following attributes:

- `inspect_view_extra_css` - Where each item is the path name of a pre-compiled stylesheet that you'd like to include.
- `inspect_view_extra_js` - Where each item is the path name of a javascript file that you'd like to include.

**Overriding templates** For all `modeladmin` views, Wagtail looks for templates in the following folders within your project, before resorting to the defaults:

1. `/modeladmin/app-name/model-name/`
2. `/modeladmin/app-name/`
3. `/modeladmin/`

So, to override the template used by `IndexView` for example, you'd create a new `index.html` template and put it in one of those locations. For example, if you wanted to do this for an `ArticlePage` model in a news app, you'd add your custom template as `modeladmin/news/article/index.html`.

For reference, `modeladmin` looks for templates with the following names for each view:

- '`index.html`' for `IndexView`
- '`inspect.html`' for `InspectView`
- '`create.html`' for `CreateView`
- '`edit.html`' for `EditView`
- '`delete.html`' for `DeleteView`
- '`choose_parent.html`' for `ChooseParentView`

If for any reason you'd rather bypass this behaviour and explicitly specify a template for a specific view, you can set either of the following attributes on your `ModelAdmin` class:

- `index_template_name` to specify a template for `IndexView`

- `inspect_template_name` to specify a template for `InspectView`
- `create_template_name` to specify a template for `CreateView`
- `edit_template_name` to specify a template for `EditView`
- `delete_template_name` to specify a template for `DeleteView`
- `choose_parent_template_name` to specify a template for `ChooseParentView`

**Overriding views** For all of the views offered by `ModelAdmin`, the class provides an attribute that you can override, to tell it which class you'd like to use:

- `index_view_class`
- `inspect_view_class`
- `create_view_class` (not used for ‘page type’ models)
- `edit_view_class` (not used for ‘page type’ models)
- `delete_view_class` (not used for ‘page type’ models)
- `choose_parent_view_class` (only used for ‘page type’ models)

For example, if you'd like to create your own view class and use it for the `IndexView`, you would do the following:

```
from wagtail.contrib.modeladmin.views import IndexView
from wagtail.contrib.modeladmin.options import ModelAdmin
from .models import MyModel

class MyCustomIndexView(IndexView):
    # New functionality and existing method overrides added here
    ...

class MyModelAdmin(ModelAdmin):
    model = MyModel
    index_view_class = MyModelIndexView
```

Or, if you have no need for any of `IndexView`'s existing functionality in your view, and would rather create your own view from scratch, `modeladmin` will support that, too. However, it's highly recommended that you use `modeladmin.views.WMABaseView` as a base for your view. It'll make integrating with your `ModelAdmin` class much easier, and provides a bunch of useful attributes and methods to get you started.

**Overriding helper classes** While ‘view classes’ are responsible for a lot of the work, there are also a number of other tasks that `modeladmin` must do regularly, that need to be handled in a consistent way, and in a number of different places. These tasks are designated to set of simple classes (in `modeladmin`, these are termed ‘helper’ classes) and can be found in `wagtail.contrib.modeladmin.helpers`.

If you ever intend to write and use your own custom views with `modeladmin`, you should familiarise yourself with these helpers, as they are made available to views via the `modeladmin.views.WMABaseView` view.

There are three types of ‘helper class’:

- **URL helpers** - That help with the consistent generation, naming and referencing of urls.
- **Permission helpers** - That help with ensuring only users with sufficient permissions can perform certain actions, or see options to perform those actions.
- **Button helpers** - That, with the help of the other two, helps with the generation of buttons for use in a number of places.

The `ModelAdmin` class allows you to define and use your own helper classes by setting values on the following attributes:

**`ModelAdmin.url_helper_class`** By default, the `modeladmin.helpers.PageAdminURLHelper` class is used when your model extends `wagtailcore.models.Page`, otherwise `modeladmin.helpers.AdminURLHelper` is used.

If you find that the above helper classes don't cater for your needs, you can easily create your own helper class, by sub-classing `AdminURLHelper` or `PageAdminURLHelper` (if your model extend's Wagtail's `Page` model), and making any neccessary additions/overrides.

Once your class is defined, set the `url_helper_class` attribute on your `ModelAdmin` class to use your custom `URLHelper`, like so:

```
from wagtail.contrib.modeladmin.helpers import AdminURLHelper
from wagtail.contrib.modeladmin.options import ModelAdmin, modeladmin_register
from .models import MyModel

class MyURLHelper(AdminURLHelper):
    ...

class MyModelAdmin(ModelAdmin):
    model = MyModel
    url_helper_class = MyURLHelper

modeladmin_register(MyModelAdmin)
```

Or, if you have a more complicated use case, where simply setting that attribute isn't possible (due to circular imports, for example) or doesn't meet your needs, you can override the `get_url_helper_class` method, like so:

```
class MyModelAdmin(ModelAdmin):
    model = MyModel

    def get_url_helper_class(self):
        if self.some_attribute is True:
            return MyURLHelper
        return AdminURLHelper
```

**`ModelAdmin.permission_helper_class`** By default, the `modeladmin.helpers.PagePermissionHelper` class is used when your model extends `wagtailcore.models.Page`, otherwise `wagtail.contrib.modeladmin.helpers.PermissionHelper` is used.

If you find that the above helper classes don't cater for your needs, you can easily create your own helper class, by sub-classing `PermissionHelper` or (if your model extend's Wagtail's `Page` model) `PagePermissionHelper`, and making any neccessary additions/overrides. Once defined, you set the `permission_helper_class` attribute on your `ModelAdmin` class to use your custom class instead of the default, like so:

```
from wagtail.contrib.modeladmin.helpers import PermissionHelper
from wagtail.contrib.modeladmin.options import ModelAdmin, modeladmin_register
from .models import MyModel

class MyPermissionHelper(PermissionHelper):
    ...
```

```
class MyModelAdmin(ModelAdmin):
    model = MyModel
    permission_helper_class = MyPermissionHelper

modeladmin_register(MyModelAdmin)
```

Or, if you have a more complicated use case, where simply setting an attribute isn't possible or doesn't meet your needs, you can override the `get_permission_helper_class` method, like so:

```
class MyModelAdmin(ModelAdmin):
    model = MyModel

    def get_permission_helper_class(self):
        if self.some_attribute is True:
            return MyPermissionHelper
        return PermissionHelper
```

**ModelAdmin.button\_helper\_class** By default, the `modeladmin.helpers.PageButtonHelper` class is used when your model extends `wagtailcore.models.Page`, otherwise `modeladmin.helpers.ButtonHelper` is used.

If you wish to add or change buttons for your model's IndexView, you'll need to create your own button helper class, by sub-classing `ButtonHelper` or (if your model extend's Wagtail's Page model) `PageButtonHelper`, and make any necessary additions/overrides. Once defined, you set the `button_helper_class` attribute on your `ModelAdmin` class to use your custom class instead of the default, like so:

```
from wagtail.contrib.modeladmin.helpers import ButtonHelper
from wagtail.contrib.modeladmin.options import ModelAdmin, modeladmin_register
from .models import MyModel

class MyButtonHelper(ButtonHelper):
    ...

class MyModelAdmin(ModelAdmin):
    model = MyModel
    button_helper_class = MyButtonHelper

modeladmin_register(MyModelAdmin)
```

Or, if you have a more complicated use case, where simply setting an attribute isn't possible or doesn't meet your needs, you can override the `get_button_helper_class` method, like so:

```
class MyModelAdmin(ModelAdmin):
    model = MyModel

    def get_button_helper_class(self):
        if self.some_attribute is True:
            return MyButtonHelper
        return ButtonHelper
```

**Using helpers in your custom views** As long as you sub-class `modeladmin.views.WMABaseView` (or one of the more 'specific' view classes) to create your custom view, instances of each helper should be available on instances of your class as:

- `self.url_helper`
- `self.permission_helper`
- `self.button_helper`

Unlike the other two, `self.button_helper` isn't populated right away when the view is instantiated. In order to show the right buttons for the right users, ButtonHelper instances need to be 'request aware', so `self.button_helper` is only set once the view's `dispatch()` method has run, which takes a `HttpRequest` object as an argument, from which the current user can be identified.

**Customising the menu item** You can use the following attributes and methods on the `ModelAdmin` class to alter the menu item used to represent your model in Wagtail's admin area.

- `ModelAdmin.menu_label`
  - `ModelAdmin.menu_icon`
  - `ModelAdmin.menu_order`
  - `ModelAdmin.add_to_settings_menu`

**ModelAdmin.menu\_label** **Expected value:** A string.

Set this attribute to a string value to override the label used for the menu item that appears in Wagtail's sidebar. If not set, the menu item will use `verbose_name_plural` from your model's Meta data.

**ModelAdmin.menu\_icon** **Expected value:** A string matching one of Wagtail's icon class names.

If you want to change the icon used to represent your model, you can set the `menu_icon` attribute on your class to use one of the other icons available in Wagtail's CMS. The same icon will be used for the menu item in Wagtail's sidebar, and will also appear in the header on the list page and other views for your model. If not set, '`doc-full-inverse`' will be used for page-type models, and '`snippet`' for others.

If you're using a `ModelAdminGroup` class to group together several `ModelAdmin` classes in their own sub-menu, and want to change the menu item used to represent the group, you should override the `menu_icon` attribute on your `ModelAdminGroup` class ('`icon-folder-open-inverse`' is the default).

**ModelAdmin.menu\_order** **Expected value:** An integer between 1 and 999.

If you want to change the position of the menu item for your model (or group of models) in Wagtail's sidebar, you do that by setting `menu_order`. The value should be an integer between 1 and 999. The lower the value, the higher up the menu item will appear.

Wagtail's 'Explorer' menu item has an order value of 100, so supply a value greater than that if you wish to keep the explorer menu item at the top.

**ModelAdmin.add\_to\_settings\_menu** **Expected value:** True or False

If you'd like the menu item for your model to appear in Wagtail's 'Settings' sub-menu instead of at the top level, add `add_to_settings_menu = True` to your `ModelAdmin` class.

This will only work for individual `ModelAdmin` classes registered with their own `modeladmin_register` call. It won't work for members of a `ModelAdminGroup`.

**Customising IndexView - the listing view** For the sake of consistency, this section of the docs will refer to the listing view as `IndexView`, because that is the view class that does all the heavy lifting.

You can use the following attributes and methods on the `ModelAdmin` class to alter how your model data is treated and represented by the `IndexView`.

- `ModelAdmin.list_display`
- `ModelAdmin.list_filter`
- `ModelAdmin.search_fields`
- `ModelAdmin.ordering`
- `ModelAdmin.list_per_page`
- `ModelAdmin.get_queryset()`
- `ModelAdmin.get_extra_class_names_for_field_col()`
- `ModelAdmin.get_extra_attrs_for_field_col()`
- `wagtail.contrib.modeladmin.options.ThumbnailMixin`
- `ModelAdmin.list_display_add_buttons`
- `ModelAdmin.index_view_extra_css`
- `ModelAdmin.index_view_extra_js`
- `ModelAdmin.index_template_name`
- `ModelAdmin.index_view_class`

**`ModelAdmin.list_display`** **Expected value:** A list or tuple, where each item is the name of a field or single-argument callable on your model, or a similarly simple method defined on the `ModelAdmin` class itself.

Default value: `('__str__',)`

Set `list_display` to control which fields are displayed in the `IndexView` for your model.

Example

```
' list_display = ('first_name', 'last_name') '
```

You have three possible values that can be used in `list_display`:

- A field of the model. For example:

```
from wagtail.contrib.modeladmin.options import ModelAdmin
from .models import Person

class PersonAdmin(ModelAdmin):
    model = Person
    list_display = ('first_name', 'last_name')
```

- The name of a custom method on your `ModelAdmin` class, that accepts a single parameter for the model instance. For example:

```
from wagtail.contrib.modeladmin.options import ModelAdmin
from .models import Person

class PersonAdmin(ModelAdmin):
    model = Person
    list_display = ('upper_case_name',)

    def upper_case_name(self, obj):
        return ("%s %s" % (obj.first_name, obj.last_name)).upper()
    upper_case_name.short_description = 'Name'
```

- The name of a method on your Model class that accepts only `self` as an argument. For example:

```
from django.db import models
from wagtail.contrib.modeladmin.options import ModelAdmin

class Person(models.Model):
    name = models.CharField(max_length=50)
    birthday = models.DateField()

    def decade_born_in(self):
        return self.birthday.strftime('%Y')[:3] + "0's"
    decade_born_in.short_description = 'Birth decade'

class PersonAdmin(ModelAdmin):
    model = Person
    list_display = ('name', 'decade_born_in')
```

A few special cases to note about `list_display`:

- If the field is a `ForeignKey`, Django will display the output of `__str__()` (`__unicode__()` on Python 2) of the related object.
- If the string provided is a method of the model or `ModelAdmin` class, Django will HTML-escape the output by default. To escape user input and allow your own unescaped tags, use `format_html()`. For example:

```
from django.db import models
from django.utils.html import format_html
from wagtail.contrib.modeladmin.options import ModelAdmin

class Person(models.Model):
    first_name = models.CharField(max_length=50)
    last_name = models.CharField(max_length=50)
    color_code = models.CharField(max_length=6)

    def colored_name(self):
        return format_html(
            '<span style="color: #{};">{} {}</span>',
            self.color_code,
            self.first_name,
            self.last_name,
        )

class PersonAdmin(ModelAdmin):
    model = Person
    list_display = ('first_name', 'last_name', 'colored_name')
```

- If the value of a field is `None`, an empty string, or an iterable without elements, Wagtail will display a dash (-) for that column. You can override this by setting `empty_value_display` on your `ModelAdmin` class. For example:

```
from wagtail.contrib.modeladmin.options import ModelAdmin

class PersonAdmin(ModelAdmin):
    empty_value_display = 'N/A'
    ...
```

Or, if you'd like to change the value used depending on the field, you can override `ModelAdmin`'s `get_empty_value_display()` method, like so:

```

from django.db import models
from wagtail.contrib.modeladmin.options import ModelAdmin

class Person(models.Model):
    name = models.CharField(max_length=100)
    nickname = models.CharField(blank=True, max_length=100)
    likes_cat_gifs = models.NullBooleanField()

class PersonAdmin(ModelAdmin):
    model = Person
    list_display = ('name', 'nickname', 'likes_cat_gifs')

    def get_empty_value_display(self, field_name=None):
        if field_name == 'nickname':
            return 'None given'
        if field_name == 'likes_cat_gifs':
            return 'Unanswered'
        return super(PersonAdmin, self).get_empty_value_display(field_name)

```

The `__str__()` (`__unicode__()` on Python 2) method is just as valid in `list_display` as any other model method, so it's perfectly OK to do this:

```
list_display = ('__str__', 'some_other_field')
```

By default, the ability to sort results by an item in `list_display` is only offered when it's a field that has an actual database value (because sorting is done at the database level). However, if the output of the method is representative of a database field, you can indicate this fact by setting the `admin_order_field` attribute on that method, like so:

```

from django.db import models
from django.utils.html import format_html
from wagtail.contrib.modeladmin.options import ModelAdmin

class Person(models.Model):
    first_name = models.CharField(max_length=50)
    last_name = models.CharField(max_length=50)
    color_code = models.CharField(max_length=6)

    def colored_first_name(self):
        return format_html(
            '<span style="color: #{};>{}</span>',
            self.color_code,
            self.first_name,
        )
    colored_first_name.admin_order_field = 'first_name'

class PersonAdmin(ModelAdmin):
    model = Person
    list_display = ('first_name', 'colored_name')

```

The above will tell Wagtail to order by the `first_name` field when trying to sort by `colored_first_name` in the index view.

To indicate descending order with `admin_order_field` you can use a hyphen prefix on the field name. Using the above example, this would look like:

```
colored_first_name.admin_order_field = '-first_name'
```

`admin_order_field` supports query lookups to sort by values on related models, too. This example includes an “author first name” column in the list display and allows sorting it by first name:

```
from django.db import models

class Blog(models.Model):
    title = models.CharField(max_length=255)
    author = models.ForeignKey(Person, on_delete=models.CASCADE)

    def author_first_name(self, obj):
        return obj.author.first_name

    author_first_name.admin_order_field = 'author__first_name'
```

- Elements of `list_display` can also be properties. Please note however, that due to the way properties work in Python, setting `short_description` on a property is only possible when using the `property()` function and **not** with the `@property` decorator.

For example:

```
from django.db import models
from wagtail.contrib.modeladmin.options import ModelAdmin

class Person(models.Model):
    first_name = models.CharField(max_length=50)
    last_name = models.CharField(max_length=50)

    def full_name_property(self):
        return self.first_name + ' ' + self.last_name
    full_name_property.short_description = "Full name of the person"

    full_name = property(full_name_property)

class PersonAdmin(ModelAdmin):
    list_display = ('full_name',)
```

**ModelAdmin.list\_filter Expected value:** A list or tuple, where each item is the name of model field of type BooleanField, CharField, DateField, DateTimeField, IntegerField or ForeignKey.

Set `list_filter` to activate filters in the right sidebar of the list page for your model. For example:

```
class PersonAdmin(ModelAdmin):
    list_filter = ('is_staff', 'company')
```

**ModelAdmin.search\_fields Expected value:** A list or tuple, where each item is the name of a model field of type CharField, TextField, RichTextField or StreamField.

Set `search_fields` to enable a search box at the top of the index page for your model. You should add names of any fields on the model that should be searched whenever somebody submits a search query using the search box.

Searching is all handled via Django’s queryset API, rather than using Wagtail’s search backend. This means it will work for all models, whatever search backend your project is using, and without any additional setup or configuration.

**ModelAdmin.ordering** **Expected value:** A list or tuple in the same format as a model's [ordering]([https://docs.djangoproject.com/en/1.9/ref/contrib/admin/#django.contrib.admin.ModelAdmin.list\\_display](https://docs.djangoproject.com/en/1.9/ref/contrib/admin/#django.contrib.admin.ModelAdmin.list_display)) parameter.

Set ordering to specify the default ordering of objects when listed by IndexView. If not provided, the model's default ordering will be respected.

If you need to specify a dynamic order (for example, depending on user or language) you can override the get\_ordering() method instead.

**ModelAdmin.list\_per\_page** **Expected value:** A positive integer

Set list\_per\_page to control how many items appear on each paginated page of the index view. By default, this is set to 100.

**ModelAdmin.get\_queryset()** **Must return:** A QuerySet

The get\_queryset method returns the 'base' queryset for your model, to which any filters and search queries are applied. By default, the all() method of your model's default manager is used. But, if for any reason you only want a certain sub-set of objects to appear in the IndexView listing, overriding the get\_queryset method on your ModelAdmin class can help you with that. The method takes an HttpRequest object as a parameter, so limiting objects by the current logged-in user is possible.

For example:

```
from django.db import models
from wagtail.contrib.modeladmin.options import ModelAdmin

class Person(models.Model):
    first_name = models.CharField(max_length=50)
    last_name = models.CharField(max_length=50)
    managed_by = models.ForeignKey(`auth.User`, on_delete=models.CASCADE)

class PersonAdmin(ModelAdmin):
    list_display = ('first_name', 'last_name')

    def get_queryset(self, request):
        qs = super(PersonAdmin, self).get_queryset(request)
        # Only show people managed by the current user
        return qs.filter(managed_by=request.user)
```

**ModelAdmin.get\_extra\_class\_names\_for\_field\_col()** **Must return:** A list

The get\_extra\_class\_names\_for\_field\_col method allows you to add additional CSS class names to any of the columns defined by list\_display for your model. The method takes two parameters:

- obj: the object being represented by the current row
- field\_name: the item from list\_display being represented by the current column

For example, if you'd like to apply some conditional formatting to a cell depending on the row's value, you could do something like:

```
from decimal import Decimal
from django.db import models
from wagtail.contrib.modeladmin.options import ModelAdmin
```

```

class BankAccount(models.Model) :
    name = models.CharField(max_length=50)
    account_number = models.CharField(max_length=50)
    balance = models.DecimalField(max_digits=5, num_places=2)

class BankAccountAdmin(ModelAdmin) :
    list_display = ('name', 'account_number', 'balance')

    def get_extra_class_names_for_field_col(self, obj, field_name):
        if field_name == 'balance':
            if balance <= Decimal('-100.00'):
                return ['brand-danger']
            if balance <= Decimal('0.00'):
                return ['brand-warning']
            if balance <= Decimal('50.00'):
                return ['brand-info']
            else:
                return ['brand-success']
        return []

```

`ModelAdmin.get_extra_attrs_for_field_col()` Must return: A dictionary

The `get_extra_attrs_for_field_col` method allows you to add additional HTML attributes to any of the columns defined in `list_display`. Like the `get_extra_class_names_for_field_col` method above, this method takes two parameters:

- `obj`: the object being represented by the current row
- `field_name`: the item from `list_display` being represented by the current column

For example, you might like to add some tooltip text to a certain column, to help give the value more context:

```

from django.db import models
from wagtail.contrib.modeladmin.options import ModelAdmin

class Person(models.Model):
    name = models.CharField(max_length=100)
    likes_cat_gifs = models.NullBooleanField()

class PersonAdmin(ModelAdmin):
    model = Person
    list_display = ('name', 'likes_cat_gifs')

    def get_extra_attrs_for_field_col(self, obj, field_name=None):
        attrs = super(PersonAdmin, self).get_extra_attrs_for_field_col(obj, field_name)
        if field_name == 'likes_cat_gifs' and obj.likes_cat_gifs is None:
            attrs.update({
                'title': (
                    'The person was shown several cat gifs, but failed to '
                    'indicate a preference.'
                ),
            })
        return attrs

```

Or you might like to add one or more data attributes to help implement some kind of interactivity using javascript:

```

from django.db import models
from wagtail.contrib.modeladmin.options import ModelAdmin

class Event(models.Model):
    title = models.CharField(max_length=255)
    start_date = models.DateField()
    end_date = models.DateField()
    start_time = models.TimeField()
    end_time = models.TimeField()

class EventAdmin(ModelAdmin):
    model = Event
    list_display = ('title', 'start_date', 'end_date')

    def get_extra_attrs_for_field_col(self, obj, field_name=None):
        attrs = super(EventAdmin, self).get_extra_attrs_for_field_col(obj, field_name)
        if field_name == 'start_date':
            # Add the start time as data to the 'start_date' cell
            attrs.update({'data-time': obj.start_time.strftime('%H:%M') })
        elif field_name == 'end_date':
            # Add the end time as data to the 'end_date' cell
            attrs.update({'data-time': obj.end_time.strftime('%H:%M') })
        return attrs

```

`wagtail.contrib.modeladmin.options.ThumbnailMixin` If you're using `wagtailimages.Image` to define an image for each item in your model, `ThumbnailMixin` can help you add thumbnail versions of that image to each row in `IndexView`. To use it, simply extend `ThumbnailMixin` as well as `ModelAdmin` when defining your `ModelAdmin` class, and change a few attributes to change the thumbnail to your liking, like so:

```

from django.db import models
from wagtail.contrib.modeladmin.options import ThumbnailMixin, ModelAdmin

class Person(models.Model):
    name = models.CharField(max_length=255)
    avatar = models.ForeignKey('wagtailimages.Image', on_delete=models.SET_NULL, null=True)
    likes_cat_gifs = models.NullBooleanField()

class PersonAdmin(ThumbnailMixin, ModelAdmin):

    # Add 'admin_thumb' to list_display, where you want the thumbnail to appear
    list_display = ('admin_thumb', 'name', 'likes_cat_gifs')

    # Optionally tell IndexView to add buttons to a different column (if the
    # first column contains the thumbnail, the buttons are likely better off
    # displayed elsewhere)
    list_display_add_buttons = 'name'

    """
    Set 'thumb_image_field_name' to the name of the ForeignKey field that
    links to 'wagtailimages.Image'
    """
    thumb_image_field_name = 'avatar'

    # Optionally override the filter spec used to create each thumb

```

```
thumb_image_filter_spec = 'fill-100x100' # this is the default

# Optionally override the 'width' attribute value added to each img tag
thumb_image_width = 50 # this is the default

# Optionally override the class name added to each img tag
thumb_classname = 'admin-thumb' # this is the default

# Optionally override the text that appears in the column header
thumb_col_header_text = 'image' # this is the default

# Optionally specify a fallback image to be used when the object doesn't
# have an image set, or the image has been deleted. It can be an image from
# your static files folder, or an external URL.
thumb_default = 'http://lorempixel.com/100/100'
```

**ModelAdmin.list\_display\_add\_buttons** **Expected value:** A string matching one of the items in `list_display`.

If for any reason you'd like to change which column the action buttons appear in for each row, you can specify a different column using `list_display_add_buttons` on your `ModelAdmin` class. The value must match one of the items your class's `list_display` attribute. By default, buttons are added to the first column of each row.

See the `ThumbnailMixin` example above to see how `list_display_add_buttons` can be used.

**ModelAdmin.index\_view\_extra\_css** **Expected value:** A list of path names of additional stylesheets to be added to the `IndexView`

See the following part of the docs to find out more: [Adding additional stylesheets and/or javascript](#)

**ModelAdmin.index\_view\_extra\_js** **Expected value:** A list of path names of additional js files to be added to the `IndexView`

See the following part of the docs to find out more: [Adding additional stylesheets and/or javascript](#)

**ModelAdmin.index\_template\_name** **Expected value:** The path to a custom template to use for `IndexView`

See the following part of the docs to find out more: [Overriding templates](#)

**ModelAdmin.index\_view\_class** **Expected value:** A custom view class to replace `modeladmin.views.IndexView`

See the following part of the docs to find out more: [Overriding views](#)

**Customising CreateView, EditView and DeleteView** **NOTE:** `modeladmin` only provides 'create', 'edit' and 'delete' functionality for non page type models (i.e. models that do not extend `wagtailcore.models.Page`). If your model is a 'page type' model, customising any of the following will not have any effect:

**Changing which fields appear in `CreateView` & `EditView`** `edit_handler` can be used on any Django models.Model class, just like it can be used for Page models or other models registered as Snippets in Wagtail.

To change the way your MyPageModel is displayed in the CreateView and the EditView, simply define an `edit_handler` or `panels` attribute on your model class.

```
class MyPageModel(models.Model):
    first_name = models.CharField(max_length=100)
    last_name = models.CharField(max_length=100)
    address = models.TextField()

    panels = [
        MultiFieldPanel([
            FieldRowPanel([
                FieldPanel('first_name', classname='fn'),
                FieldPanel('last_name', classname='ln'),
            ]),
            FieldPanel('address', classname='custom1'),
        ])
    ]
```

Or alternatively:

```
class MyPageModel(models.Model):
    first_name = models.CharField(max_length=100)
    last_name = models.CharField(max_length=100)
    address = models.TextField()

    custom_panels = [
        MultiFieldPanel([
            FieldRowPanel([
                FieldPanel('first_name', classname='fn'),
                FieldPanel('last_name', classname='ln'),
            ]),
            FieldPanel('address', classname='custom1'),
        ])
    ]
    edit_handler = ObjectList(custom_panels)
    # or
    edit_handler = TabbedInterface([ObjectList(custom_panels), ObjectList(...)])
```

**ModelAdmin.form\_view\_extra\_css** **Expected value:** A list of path names of additional stylesheets to be added to CreateView and EditView

See the following part of the docs to find out more: [Adding additional stylesheets and/or javascript](#)

**ModelAdmin.form\_view\_extra\_js** **Expected value:** A list of path names of additional js files to be added to CreateView and EditView

See the following part of the docs to find out more: [Adding additional stylesheets and/or javascript](#)

**ModelAdmin.create\_template\_name** **Expected value:** The path to a custom template to use for CreateView

See the following part of the docs to find out more: [Overriding templates](#)

**ModelAdmin.create\_view\_class** **Expected value:** A custom view class to replace `modeladmin.views.CreateView`

See the following part of the docs to find out more: [Overriding views](#)

**ModelAdmin.edit\_template\_name** **Expected value:** The path to a custom template to use for EditView

See the following part of the docs to find out more: [Overriding templates](#)

**ModelAdmin.edit\_view\_class** **Expected value:** A custom view class to replace modeladmin.views.EditView

See the following part of the docs to find out more: [Overriding views](#)

**ModelAdmin.delete\_template\_name** **Expected value:** The path to a custom template to use for DeleteView

See the following part of the docs to find out more: [Overriding templates](#)

**ModelAdmin.delete\_view\_class** **Expected value:** A custom view class to replace modeladmin.views.DeleteView

See the following part of the docs to find out more: [Overriding views](#)

**Enabling & customising InspectView** The InspectView is disabled by default, as it's not often useful for most models. However, if you need a view that enables users to view more detailed information about an instance without the option to edit it, you can easily enable the inspect view by setting `inspect_view_enabled=True` on your ModelAdmin class.

When enabled, an ‘Inspect’ button will automatically appear for each row in your index / listing view, linking to new page that shows values a list of field values for that particular object.

By default, all ‘concrete’ fields (where the field value is stored as a column in the database table for your model) will be shown. You can customise what values are displayed by adding the following attributes to your ModelAdmin class:

- `ModelAdmin.inspect_view_fields`
- `ModelAdmin.inspect_view_fields_exclude`
- `ModelAdmin.inspect_view_extra_css`
- `ModelAdmin.inspect_view_extra_js`
- `ModelAdmin.inspect_template_name`
- `ModelAdmin.inspect_view_class`

**ModelAdmin.inspect\_view\_fields** **Expected value:** A list or tuple, where each item is the name of a field that you'd like InspectView to render.

A sensible value will be rendered for most field types.

If a field happens to be a ForeignKey linking to the wagtailimages.Image model, a thumbnail of that image will be rendered.

If a field happens to be a ForeignKey linking to the wagtailedocs.Document model, a link to that document will be rendered.

**ModelAdmin.inspect\_view\_fields\_exclude** **Expected value:** A list or tuple, where each item is the name of a field that you'd like to exclude from `InspectView`

**Note:** If both `inspect_view_fields` and `inspect_view_fields_exclude` are set, `inspect_view_fields_exclude` will be ignored.

**ModelAdmin.inspect\_view\_extra\_css** **Expected value:** A list of path names of additional stylesheets to be added to the `InspectView`

See the following part of the docs to find out more: [Adding additional stylesheets and/or javascript](#)

**ModelAdmin.inspect\_view\_extra\_js** **Expected value:** A list of path names of additional js files to be added to the `InspectView`

See the following part of the docs to find out more: [Adding additional stylesheets and/or javascript](#)

**ModelAdmin.inspect\_template\_name** **Expected value:** The path to a custom template to use for `InspectView`

See the following part of the docs to find out more: [Overriding templates](#)

**ModelAdmin.inspect\_view\_class** **Expected value:** A custom view class to replace `modeladmin.views.InspectView`

See the following part of the docs to find out more: [Overriding views](#)

**Customising ChooseParentView** When adding a new page via Wagtail's explorer view, you essentially choose where you want to add a new page by navigating the relevant part of the page tree and choosing to 'add a child page' to your chosen parent page. Wagtail then asks you to select what type of page you'd like to add.

When adding a page from a `ModelAdmin` list page, we know what type of page needs to be added, but we might not automatically know where in the page tree it should be added. If there's only one possible choice of parent for a new page (as defined by setting `parent_page_types` and `subpage_types` attributes on your models), then we skip a step and use that as the parent. Otherwise, the user must specify a parent page using `modeladmin`'s `ChooseParentView`.

It should be very rare that you need to customise this view, but in case you do, `modeladmin` offers the following attributes that you can override:

- `ModelAdmin.choose_parent_template_name`
- `ModelAdmin.choose_parent_view_class`

**ModelAdmin.choose\_parent\_template\_name** **Expected value:** The path to a custom template to use for `ChooseParentView`

See the following part of the docs to find out more: [Overriding templates](#)

**ModelAdmin.choose\_parent\_view\_class** **Expected value:** A custom view class to replace `modeladmin.views.ChooseParentView`

See the following part of the docs to find out more: [Overriding views](#)

**Installation** Add `wagtail.contrib.modeladmin` to your `INSTALLED_APPS`:

```
INSTALLED_APPS = [
    ...
    'wagtail.contrib.modeladmin',
]
```

### How to use

**A simple example** You have a model in your app, and you want a listing page specifically for that model, with a menu item added to the menu in the Wagtail admin area so that you can get to it.

`wagtail_hooks.py` in your app directory would look something like this:

```
from wagtail.contrib.modeladmin.options import (
    ModelAdmin, modeladmin_register)
from .models import MyPageModel


class MyPageModelAdmin(ModelAdmin):
    model = MyPageModel
    menu_label = 'Page Model' # ditch this to use verbose_name_plural from model
    menu_icon = 'date' # change as required
    menu_order = 200 # will put in 3rd place (000 being 1st, 100 2nd)
    add_to_settings_menu = False # or True to add your model to the Settings sub-menu
    list_display = ('title', 'example_field2', 'example_field3', 'live')
    list_filter = ('live', 'example_field2', 'example_field3')
    search_fields = ('title',)

# Now you just need to register your customised ModelAdmin class with Wagtail
modeladmin_register(MyPageModelAdmin)
```

**A more complicated example** You have an app with several models that you want to show grouped together in Wagtail's admin menu. Some of the models might extend `Page`, and others might be simpler models, perhaps registered as Snippets, perhaps not. No problem! `ModelAdminGroup` allows you to group them all together nicely.

`wagtail_hooks.py` in your app directory would look something like this:

```
from wagtail.contrib.modeladmin.options import (
    ModelAdmin, ModelAdminGroup, modeladmin_register)
from .models import (
    MyPageModel, MyOtherPageModel, MySnippetModel, SomeOtherModel)


class MyPageModelAdmin(ModelAdmin):
    model = MyPageModel
    menu_label = 'Page Model' # ditch this to use verbose_name_plural from model
    menu_icon = 'doc-full-inverse' # change as required
    list_display = ('title', 'example_field2', 'example_field3', 'live')
    list_filter = ('live', 'example_field2', 'example_field3')
    search_fields = ('title',)

class MyOtherPageModelAdmin(ModelAdmin):
    model = MyOtherPageModel
    menu_label = 'Other Page Model' # ditch this to use verbose_name_plural from model
```

```

menu_icon = 'doc-full-inverse' # change as required
list_display = ('title', 'example_field2', 'example_field3', 'live')
list_filter = ('live', 'example_field2', 'example_field3')
search_fields = ('title',)

class MySnippetModelAdmin(ModelAdmin):
    model = MySnippetModel
    menu_label = 'Snippet Model' # ditch this to use verbose_name_plural from model
    menu_icon = 'snippet' # change as required
    list_display = ('title', 'example_field2', 'example_field3')
    list_filter = ('example_field2', 'example_field3')
    search_fields = ('title',)

class SomeOtherModelAdmin(ModelAdmin):
    model = SomeOtherModel
    menu_label = 'Some other model' # ditch this to use verbose_name_plural from model
    menu_icon = 'snippet' # change as required
    list_display = ('title', 'example_field2', 'example_field3')
    list_filter = ('example_field2', 'example_field3')
    search_fields = ('title',)

class MyModelAdminGroup(ModelAdminGroup):
    menu_label = 'My App'
    menu_icon = 'folder-open-inverse' # change as required
    menu_order = 200 # will put in 3rd place (000 being 1st, 100 2nd)
    items = (MyPageModelAdmin, MyOtherPageModelAdmin, MySnippetModelAdmin, SomeOtherModelAdmin)

# When using a ModelAdminGroup class to group several ModelAdmin classes together,
# you only need to register the ModelAdminGroup class with Wagtail:
modeladmin_register(MyModelAdminGroup)

```

**Registering multiple classes in one `wagtail_hooks.py` file** If you have an app with more than one model that you wish to manage, or even multiple models you wish to group together with `ModelAdminGroup` classes, that's possible. Just register each of your `ModelAdmin` classes using `modeladmin_register`, and they'll work as expected.

```

class MyPageModelAdmin(ModelAdmin):
    model = MyPageModel
    ...

class MyOtherPageModelAdmin(ModelAdmin):
    model = MyOtherPageModel
    ...

class MyModelAdminGroup(ModelAdminGroup):
    label = _("Group 1")
    items = (ModelAdmin1, ModelAdmin2)
    ...

class MyOtherModelAdminGroup(ModelAdminGroup):
    label = _("Group 2")
    items = (ModelAdmin3, ModelAdmin4)
    ...

```

```
modeladmin_register(MyPageModelAdmin)
modeladmin_register(MyOtherPageModelAdmin)
modeladmin_register(MyModelAdminGroup)
modeladmin_register(MyOtherModelAdminGroup)
```

### Promoted search results

Changed in version 1.1: Before Wagtail 1.1, promoted search results were implemented in the `wagtail.wagtailsearch` core module and called “editors picks”.

The `searchpromotions` module provides the models and user interface for managing “Promoted search results” and displaying them in a search results page.

“Promoted search results” allow editors to explicitly link relevant content to search terms, so results pages can contain curated content in addition to results from the search engine.

### Installation

The `searchpromotions` module is not enabled by default. To install it, add `wagtail.contrib.wagtailsearchpromotions` to `INSTALLED_APPS` in your project’s Django settings file.

```
INSTALLED_APPS = [
    ...
    'wagtail.contrib.wagtailsearchpromotions',
]
```

This app contains migrations so make sure you run the `migrate` `django-admin` command after installing.

### Usage

Once installed, a new menu item called “Promoted search results” should appear in the “Settings” menu. This is where you can assign pages to popular search terms.

**Displaying on a search results page** To retrieve a list of promoted search results for a particular search query, you can use the `{% get_search_promotions %}` template tag from the `wagtailsearchpromotions_tags` templatetag library:

```
{% load wagtailcore_tags wagtailsearchpromotions_tags %}

...
{% get_search_promotions search_query as search_promotions %}

<ul>
    {% for search_promotion in search_promotions %}
        <li>
            <a href="{% pageurl search_promotion.page %}">
                <h2>{{ search_promotion.page.title }}</h2>
                <p>{{ search_promotion.description }}</p>
            </a>
        </li>
    {% endfor %}
</ul>
```

```
{% endfor %}
</ul>
```

## TableBlock

The TableBlock module provides an HTML table block type for StreamField. This module uses `handsontable` to provide users with the ability to create and edit HTML tables in Wagtail.

## Installation

Add "wagtail.contrib.table\_block" to your INSTALLED\_APPS:

```
INSTALLED_APPS = [
    ...
    "wagtail.contrib.table_block",
]
```

## Basic Usage

After installation the TableBlock module can be used in a similar fashion to other StreamField blocks in the Wagtail core.

Just import the TableBlock from `wagtail.contrib.table_block.blocks` import TableBlock and add it to your StreamField declaration.

```
class DemoStreamBlock(StreamBlock):
    ...
    table = TableBlock()
```

## Advanced Usage

**Default Configuration** When defining a TableBlock, Wagtail provides the ability to pass an optional `table_options` dictionary. The default TableBlock dictionary looks like this:

```
default_table_options = {  
    'minSpareRows': 0,  
    'startRows': 3,  
    'startCols': 3,  
    'colHeaders': False,  
    'rowHeaders': False,  
    'contextMenu': True,  
    'editor': 'text',  
    'stretchH': 'all',  
    'height': 108,  
    'language': language,  
    'renderer': 'text',  
    'autoColumnSize': False,  
}
```

**Configuration Options** Every key in the `table_options` dictionary maps to a [handsontable](#) option. These settings can be changed to alter the behaviour of tables in Wagtail. The following options are available:

- `minSpareRows` - The number of rows to append to the end of an empty grid. The default setting is 0.
- `startRows` - The default number of rows for a new table.
- `startCols` - The default number of columns for new tables.
- `colHeaders` - Can be set to `True` or `False`. This setting designates if new tables should be created with column rows. **Note:** this only sets the behaviour for newly created tables. Page editors can override this by checking the “Column header” checkbox in the table editor in the Wagtail admin.
- `rowHeaders` - Operates the same as `colHeaders` to designate if new tables should be created with the first row as a header. Just like `colHeaders` this option can be overridden by the page editor in the Wagtail admin.
- `contextMenu` - Enables or disables the handsontable right-click menu. By default this is set to `True`.
- `editor` - Defines the editor used for table cells. The default setting is `text`.
- `stretchH` - Sets the default horizontal resizing of tables. Options include, ‘none’, ‘last’, and ‘all’. By default TableBlock uses ‘all’ for the even resizing of columns.
- `height` - The default height of the grid. By default TableBlock sets the height to 108 for the optimal appearance of new tables in the editor. This is optimized for tables with `startRows` set to 3. If you change the number of `startRows` in the configuration you might need to change the `height` setting to improve the default appearance in the editor.
- `language` - The default language setting. By default TableBlock tries to get the language from `django.utils.translation.get_language`. If needed, this setting can be overridden here.
- `renderer` - The default setting handsontable uses to render the content of table cells.
- `autoColumnSize` - Enables or disables the `autoColumnSize` plugin. The TableBlock default setting is `False`.

A complete list of [handsontable](#) options can be found on the [handsontable](#) website.

**Changing the default `table_options`** To change the default table options just pass a new `table_options` dictionary when a new TableBlock is declared.

```
new_table_options = {
    'minSpareRows': 0,
    'startRows': 6,
    'startCols': 4,
    'colHeaders': False,
    'rowHeaders': False,
    'contextMenu': True,
    'editor': 'text',
    'stretchH': 'all',
    'height': 216,
    'language': 'en',
    'renderer': 'text',
    'autoColumnSize': False,
}

class DemoStreamBlock(StreamBlock):
    ...
    table = TableBlock(table_options=new_table_options)
```

## **Site settings**

Site-wide settings that are editable by administrators in the Wagtail admin.

## **Form builder**

Allows forms to be created by admins and provides an interface for browsing form submissions.

## **Static site generator**

Provides a management command that turns a Wagtail site into a set of static HTML files.

## **Sitemap generator**

Provides a view that generates a Google XML sitemap of your public Wagtail content.

## **Frontend cache invalidator**

A module for automatically purging pages from a cache (Varnish, Squid, Cloudflare or Cloudfront) when their content is changed.

## **RoutablePageMixin**

Provides a way of embedding Django URLconfs into pages.

## **Wagtail API**

A module for adding a read only, JSON based web API to your Wagtail site

### ***ModelAdmin***

A module allowing for more customisable representation and management of custom models in Wagtail’s admin area.

### ***Promoted search results***

A module for managing “Promoted Search Results”

### ***TableBlock***

Provides a TableBlock for adding HTML tables to pages.

## **Management commands**

### **publish\_scheduled\_pages**

```
./manage.py publish_scheduled_pages
```

This command publishes or unpublishes pages that have had these actions scheduled by an editor. It is recommended to run this command once an hour.

### **fixtree**

```
./manage.py fixtree
```

This command scans for errors in your database and attempts to fix any issues it finds.

### **move\_pages**

```
manage.py move_pages from to
```

This command moves a selection of pages from one section of the tree to another.

Options:

- **from** This is the **id** of the page to move pages from. All descendants of this page will be moved to the destination. After the operation is complete, this page will have no children.
- **to** This is the **id** of the page to move pages to.

### **update\_index**

```
./manage.py update_index [--backend <backend name>]
```

This command rebuilds the search index from scratch. It is only required when using Elasticsearch.

It is recommended to run this command once a week and at the following times:

- whenever any pages have been created through a script (after an import, for example)
- whenever any changes have been made to models or search configuration

The search may not return any results while this command is running, so avoid running it at peak times.

## Specifying which backend to update

New in version 0.7.

By default, `update_index` will rebuild all the search indexes listed in `WAGTAILSEARCH_BACKENDS`.

If you have multiple backends and would only like to update one of them, you can use the `--backend` option.

For example, to update just the default backend:

```
python manage.py update_index --backend default
```

## Indexing the schema only

New in version 1.5.

You can prevent the `update_index` command from indexing any data by using the `--schema-only` option:

```
python manage.py update_index --schema-only
```

## search\_garbage\_collect

```
./manage.py search_garbage_collect
```

Wagtail keeps a log of search queries that are popular on your website. On high traffic websites, this log may get big and you may want to clean out old search queries. This command cleans out all search query logs that are more than one week old (or a number of days configurable through the `WAGTAILSEARCH_HITS_MAX_AGE` setting).

## Hooks

On loading, Wagtail will search for any app with the file `wagtail_hooks.py` and execute the contents. This provides a way to register your own functions to execute at certain points in Wagtail's execution, such as when a Page object is saved or when the main menu is constructed.

Registering functions with a Wagtail hook is done through the `@hooks.register` decorator:

```
from wagtail.wagtailcore import hooks

@hooks.register('name_of_hook')
def my_hook_function(arg1, arg2...)
    # your code here
```

Alternatively, `hooks.register` can be called as an ordinary function, passing in the name of the hook and a handler function defined elsewhere:

```
hooks.register('name_of_hook', my_hook_function)
```

The available hooks are listed below.

- *Admin modules*
- *Editor interface*
- *Editor workflow*
- *Page explorer*
- *Page serving*

## Admin modules

Hooks for building new areas of the admin interface (alongside pages, images, documents and so on).

### construct\_homepage\_panels

Add or remove panels from the Wagtail admin homepage. The callable passed into this hook should take a `request` object and a list of `panels`, objects which have a `render()` method returning a string. The objects also have an `order` property, an integer used for ordering the panels. The default panels use integers between 100 and 300.

```
from django.utils.safestring import mark_safe

from wagtail.wagtailcore import hooks

class WelcomePanel(object):
    order = 50

    def render(self):
        return mark_safe("""
            <section class="panel summary nice-padding">
                <h3>No, but seriously -- welcome to the admin homepage.</h3>
            </section>
        """)"

@hooks.register('construct_homepage_panels')
def add_another_welcome_panel(request, panels):
    return panels.append(WelcomePanel())
```

### construct\_homepage\_summary\_items

New in version 1.0.

Add or remove items from the ‘site summary’ bar on the admin homepage (which shows the number of pages and other object that exist on the site). The callable passed into this hook should take a `request` object and a list of `SummaryItem` objects to be modified as required. These objects have a `render()` method, which returns an HTML string, and an `order` property, which is an integer that specifies the order in which the items will appear.

### construct\_main\_menu

Called just before the Wagtail admin menu is output, to allow the list of menu items to be modified. The callable passed to this hook will receive a `request` object and a list of `menu_items`, and should modify `menu_items` in-place as required. Adding menu items should generally be done through the `register_admin_menu_item` hook instead - items added through `construct_main_menu` will be missing any associated JavaScript includes, and their `is_shown` check will not be applied.

```
from wagtail.wagtailcore import hooks

@hooks.register('construct_main_menu')
def hide_explorer_menu_item_from_frank(request, menu_items):
    if request.user.username == 'frank':
        menu_items[:] = [item for item in menu_items if item.name != 'explorer']
```

**describe\_collection\_contents**

Called when Wagtail needs to find out what objects exist in a collection, if any. Currently this happens on the confirmation before deleting a collection, to ensure that non-empty collections cannot be deleted. The callable passed to this hook will receive a `collection` object, and should return either `None` (to indicate no objects in this collection), or a dict containing the following keys:

**count** A numeric count of items in this collection

**count\_text** A human-readable string describing the number of items in this collection, such as “3 documents”. (Sites with multi-language support should return a translatable string here, most likely using the `django.utils.translation.ungettext` function.)

**url (optional)** A URL to an index page that lists the objects being described.

**register\_admin\_menu\_item**

Add an item to the Wagtail admin menu. The callable passed to this hook must return an instance of `wagtail.wagtailadmin.menu.MenuItem`. New items can be constructed from the `MenuItem` class by passing in a `label` which will be the text in the menu item, and the URL of the admin page you want the menu item to link to (usually by calling `reverse()` on the admin view you’ve set up). Additionally, the following keyword arguments are accepted:

**name** an internal name used to identify the menu item; defaults to the slugified form of the label.

**classnames** additional classnames applied to the link, used to give it an icon

**attrs** additional HTML attributes to apply to the link

**order** an integer which determines the item’s position in the menu

`MenuItem` can be subclassed to customise the HTML output, specify JavaScript files required by the menu item, or conditionally show or hide the item for specific requests (for example, to apply permission checks); see the source code (`wagtail/wagtailadmin/menu.py`) for details.

```
from django.core.urlresolvers import reverse

from wagtail.wagtailcore import hooks
from wagtail.wagtailadmin.menu import MenuItem

@hooks.register('register_admin_menu_item')
def register_frank_menu_item():
    return MenuItem('Frank', reverse('frank'), classnames='icon icon-folder-inverse', order=10000)
```

**register\_admin\_urls**

Register additional admin page URLs. The callable fed into this hook should return a list of Django URL patterns which define the structure of the pages and endpoints of your extension to the Wagtail admin. For more about vanilla Django URLconfs and views, see `url dispatcher`.

```
from django.http import HttpResponseRedirect
from django.conf.urls import url

from wagtail.wagtailcore import hooks

def admin_view( request ):
```

```
return HttpResponse( \
    "I have approximate knowledge of many things!", \
    content_type="text/plain")

@hooks.register('register_admin_urls')
def urlconf_time():
    return [
        url(r'^how_did_you_almost_know_my_name/$', admin_view, name='frank' ),
    ]
```

### `register_group_permission_panel`

Add a new panel to the Groups form in the ‘settings’ area. The callable passed to this hook must return a ModelForm / ModelFormSet-like class, with a constructor that accepts a group object as its `instance` keyword argument, and which implements the methods `save`, `is_valid`, and `as_admin_panel` (which returns the HTML to be included on the group edit page).

### `register_settings_menu_item`

As `register_admin_menu_item`, but registers menu items into the ‘Settings’ sub-menu rather than the top-level menu.

### `register_admin_search_area`

Add an item to the Wagtail admin search “Other Searches”. Behaviour of this hook is similar to `register_admin_menu_item`. The callable passed to this hook must return an instance of `wagtail.wagtailadmin.search.SearchArea`. New items can be constructed from the `SearchArea` class by passing the following parameters:

**label** text displayed in the “Other Searches” option box.

**name** an internal name used to identify the search option; defaults to the slugified form of the label.

**url** the URL of the target search page.

**classnames** additional CSS classnames applied to the link, used to give it an icon.

**attrs** additional HTML attributes to apply to the link.

**order** an integer which determines the item’s position in the list of options.

Setting the URL can be achieved using `reverse()` on the target search page. The GET parameter ‘`q`’ will be appended to the given URL.

A template tag, `search_other` is provided by the `wagtailadmin_tags` template module. This tag takes a single, optional parameter, `current`, which allows you to specify the name of the search option currently active. If the parameter is not given, the hook defaults to a reverse lookup of the page’s URL for comparison against the `url` parameter.

`SearchArea` can be subclassed to customise the HTML output, specify JavaScript files required by the option, or conditionally show or hide the item for specific requests (for example, to apply permission checks); see the source code (`wagtail/wagtailadmin/search.py`) for details.

```

from django.core.urlresolvers import reverse
from wagtail.wagtailcore import hooks
from wagtail.wagtailadmin.search import SearchArea

@hooks.register('register_admin_search_area')
def register_frank_search_area():
    return SearchArea('Frank', reverse('frank'), classnames='icon icon-folder-inverse', order=10)

```

**register\_permissions**

Return a queryset of `Permission` objects to be shown in the Groups administration area.

**filter\_form\_submissions\_for\_user**

Allows access to form submissions to be customised on a per-user, per-form basis.

**This hook takes two parameters:**

- The user attempting to access form submissions
- A `QuerySet` of form pages

The hook must return a `QuerySet` containing a subset of these form pages which the user is allowed to access the submissions for.

For example, to prevent non-superusers from accessing form submissions:

```

from wagtail.wagtailcore import hooks

@hooks.register('filter_form_submissions_for_user')
def construct_forms_for_user(user, queryset):
    if not user.is_superuser:
        queryset = queryset.none()

    return queryset

```

## Editor interface

Hooks for customising the editing interface for pages and snippets.

**construct\_whitelister\_element\_rules**

Customise the rules that define which HTML elements are allowed in rich text areas. By default only a limited set of HTML elements and attributes are whitelisted - all others are stripped out. The callables passed into this hook must return a dict, which maps element names to handler functions that will perform some kind of manipulation of the element. These handler functions receive the element as a `BeautifulSoup` Tag object.

The `wagtail.wagtailcore.whitelist` module provides a few helper functions to assist in defining these handlers: `allow_without_attributes`, a handler which preserves the element but strips out all of its attributes, and `attribute_rule` which accepts a dict specifying how to handle each attribute, and returns a handler function. This dict will map attribute names to either True (indicating that

the attribute should be kept), False (indicating that it should be dropped), or a callable (which takes the initial attribute value and returns either a final value for the attribute, or None to drop the attribute).

For example, the following hook function will add the `<blockquote>` element to the whitelist, and allow the `target` attribute on `<a>` elements:

```
from wagtail.wagtailcore import hooks
from wagtail.wagtailcore.whitelist import attribute_rule, check_url, allow_without_attributes

@hooks.register('construct_whitelister_element_rules')
def whitelister_element_rules():
    return {
        'blockquote': allow_without_attributes,
        'a': attribute_rule({'href': check_url, 'target': True}),
    }
```

### insert\_editor\_css

Add additional CSS files or snippets to the page editor.

```
from django.contrib.staticfiles.templatetags.staticfiles import static
from django.utils.html import format_html

from wagtail.wagtailcore import hooks

@hooks.register('insert_editor_css')
def editor_css():
    return format_html(
        '<link rel="stylesheet" href="{}">',
        static('demo/css/vendor/font-awesome/css/font-awesome.min.css')
    )
```

### insert\_global\_admin\_css

Add additional CSS files or snippets to all admin pages.

```
from django.utils.html import format_html
from django.contrib.staticfiles.templatetags.staticfiles import static

from wagtail.wagtailcore import hooks

@hooks.register('insert_global_admin_css')
def global_admin_css():
    return format_html('<link rel="stylesheet" href="{}">', static('my/wagtail/theme.css'))
```

### insert\_editor\_js

Add additional JavaScript files or code snippets to the page editor.

```
from django.utils.html import format_html, format_html_join
from django.conf import settings

from wagtail.wagtailcore import hooks

@hooks.register('insert_editor_js')
```

```
def editor_js():
    js_files = [
        'demo/js/hallo-plugins/hallo-demo-plugin.js',
    ]
    js_includes = format_html_join('\n', '<script src="{0}{1}"></script>',
        ((settings.STATIC_URL, filename) for filename in js_files)
    )
    return js_includes + format_html(
        """
        <script>
            registerHalloPlugin('demoeditor');
        </script>
        """
    )
)
```

### insert\_global\_admin\_js

Add additional JavaScript files or code snippets to all admin pages.

```
from django.utils.html import format_html

from wagtail.wagtailcore import hooks

@hooks.register('insert_global_admin_js')
def global_admin_js():
    return format_html(
        '<script src="https://cdnjs.cloudflare.com/ajax/libs/three.js/r74/three.js"></script>',
    )
)
```

## Editor workflow

Hooks for customising the way users are directed through the process of creating page content.

### after\_create\_page

Do something with a Page object after it has been saved to the database (as a published page or a revision). The callable passed to this hook should take a request object and a page object. The function does not have to return anything, but if an object with a status\_code property is returned, Wagtail will use it as a response object. By default, Wagtail will instead redirect to the Explorer page for the new page's parent.

```
from django.http import HttpResponseRedirect

from wagtail.wagtailcore import hooks

@hooks.register('after_create_page')
def do_after_page_create(request, page):
    return HttpResponseRedirect("Congrats on making content!", content_type="text/plain")
```

### before\_create\_page

Called at the beginning of the “create page” view passing in the request, the parent page and page model class.

The function does not have to return anything, but if an object with a `status_code` property is returned, Wagtail will use it as a response object and skip the rest of the view.

Unlike, `after_create_page`, this is run both for both GET and POST requests.

This can be used to completely override the editor on a per-view basis:

```
from wagtail.wagtailcore import hooks

from .models import AwesomePage
from .admin_views import edit_awesome_page

@hooks.register('before_create_page')
def before_create_page(request, parent_page, page_class):
    # Use a custom create view for the AwesomePage model
    if page_class == AwesomePage:
        return create_awesome_page(request, parent_page)
```

### `after_delete_page`

Do something after a Page object is deleted. Uses the same behavior as `after_create_page`.

### `before_delete_page`

Called at the beginning of the “delete page” view passing in the request and the page object.

Uses the same behavior as `before_create_page`.

### `after_edit_page`

Do something with a Page object after it has been updated. Uses the same behavior as `after_create_page`.

### `before_edit_page`

Called at the beginning of the “edit page” view passing in the request and the page object.

Uses the same behavior as `before_create_page`.

### `construct_wagtail_userbar`

Changed in version 1.0: The hook was renamed from `construct_wagtail_edit_bird`

Add or remove items from the wagtail userbar. Add, edit, and moderation tools are provided by default. The callable passed into the hook must take the `request` object and a list of menu objects, `items`. The menu item objects must have a `render` method which can take a `request` object and return the HTML string representing the menu item. See the userbar templates and menu item classes for more information.

```
from wagtail.wagtailcore import hooks

class UserbarPuppyLinkItem(object):
    def render(self, request):
        return '<li><a href="http://cuteoverload.com/tag/puppehs/" ' \
```

```
+ 'target="_parent" class="action icon icon-wagtail">Puppies!</a></li>'  
  
@hooks.register('construct_wagtail_userbar')  
def add_puppy_link_item(request, items):  
    return items.append( UserbarPuppyLinkItem() )
```

## Page explorer

### construct\_explorer\_page\_queryset

Called when rendering the page explorer view, to allow the page listing queryset to be customised. The callable passed into the hook will receive the parent page object, the current page queryset, and the request object, and must return a Page queryset (either the original one, or a new one).

```
from wagtail.wagtailcore import hooks  
  
@hooks.register('construct_explorer_page_queryset')  
def show_my_profile_only(parent_page, pages, request):  
    # If we're in the 'user-profiles' section, only show the user's own profile  
    if parent_page.slug == 'user-profiles':  
        pages = pages.filter(owner=request.user)  
  
    return pages
```

### register\_page\_listing\_buttons

Add buttons to the actions list for a page in the page explorer. This is useful when adding custom actions to the listing, such as translations or a complex workflow.

This example will add a simple button to the listing:

```
from wagtail.wagtailadmin import widgets as wagtailadmin_widgets  
  
@hooks.register('register_page_listing_buttons')  
def page_listing_buttons(page, page_perms, is_parent=False):  
    yield wagtailadmin_widgets.PageListingButton(  
        'A page listing button',  
        '/goes/to/a/url/',  
        priority=10  
    )
```

The `priority` argument controls the order the buttons are displayed in. Buttons are ordered from low to high priority, so a button with `priority=10` will be displayed before a button with `priority=20`.

## Buttons with dropdown lists

The admin widgets also provide `ButtonWithDropdownFromHook`, which allows you to define a custom hook for generating a dropdown menu that gets attached to your button.

Creating a button with a dropdown menu involves two steps. Firstly, you add your button to the `register_page_listing_buttons` hook, just like the example above. Secondly, you register a new hook that yields the contents of the dropdown menu.

This example shows how Wagtail's default admin dropdown is implemented. You can also see how to register buttons conditionally, in this case by evaluating the `page_perms`:

```
@hooks.register('register_page_listing_buttons')
def page_custom_listing_buttons(page, page_perms, is_parent=False):
    yield wagtailadmin_widgets.ButtonWithDropdownFromHook(
        'More actions',
        hook_name='my_button_dropdown_hook',
        page=page,
        page_perms=page_perms,
        is_parent=is_parent,
        priority=50
    )

@hooks.register('my_button_dropdown_hook')
def page_custom_listing_more_buttons(page, page_perms, is_parent=False):
    if page_perms.can_move():
        yield Button('Move', reverse('wagtailadmin_pages:move', args=[page.id]), priority=10)
    if page_perms.can_delete():
        yield Button('Delete', reverse('wagtailadmin_pages:delete', args=[page.id]), priority=30)
    if page_perms.can_unpublish():
        yield Button('Unpublish', reverse('wagtailadmin_pages:unpublish', args=[page.id]), prior
```

The template for the dropdown button can be customised by overriding `wagtailadmin/pages/listing/_button_with_dropdown.html`. The JavaScript that runs the dropdowns makes use of custom data attributes, so you should leave `data-dropdown` and `data-dropdown-toggle` in the markup if you customise it.

## Page serving

### `before_serve_page`

Called when Wagtail is about to serve a page. The callable passed into the hook will receive the page object, the request object, and the `args` and `kwargs` that will be passed to the page's `serve()` method. If the callable returns an `HttpResponse`, that response will be returned immediately to the user, and Wagtail will not proceed to call `serve()` on the page.

```
from wagtail.wagtailcore import hooks

@hooks.register('before_serve_page')
def block_googlebot(page, request, serve_args, serve_kwargs):
    if request.META.get('HTTP_USER_AGENT') == 'GoogleBot':
        return HttpResponse("<h1>bad googlebot no cookie</h1>")
```

## Signals

Wagtail's `PageRevision` and `Page` implement Signals from `django.dispatch`. Signals are useful for creating side-effects from page publish/unpublish events.

Primarily, these are used by the [Frontend Cache contrib module](#) and the [Wagtail API](#). You could also use signals to send publish notifications to a messaging service, or POST messages to another app that's consuming the API, such as a static site generator.

### `page_published`

This signal is emitted from a `PageRevision` when a revision is set to *published*.

**sender** The page class

**instance** The specific Page instance.

**revision** The PageRevision that was published

**kwargs** Any other arguments passed to `page_published.send()`.

To listen to a signal, implement `page_published.connect(receiver, sender, **kwargs)`. Here's a simple example showing how you might notify your team when something is published:

```
from wagtail.wagtailcore.signals import page_published
import urllib
import urllib2

# Let everyone know when a new page is published
def send_to_slack(sender, **kwargs):
    instance = kwargs['instance']
    url = 'https://hooks.slack.com/services/T00000000/B00000000/XXXXXXXXXXXXXXXXXXXX'
    values = {
        "text": "%s was published by %s" % (instance.title, instance.owner.username),
        "channel": "#publish-notifications",
        "username": "the squid of content",
        "icon_emoji": ":octopus:"
    }

    data = urllib.urlencode(values)
    req = urllib2.Request(url, data)
    response = urllib2.urlopen(req)

# Register a receiver
page_published.connect(send_to_slack)
```

## Receiving specific model events

Sometimes you're not interested in receiving signals for every model, or you want to handle signals for specific models in different ways. For instance, you may wish to do something when a new blog post is published:

```
from wagtail.wagtailcore.signals import page_published
from mysite.models import BlogPostPage

# Do something clever for each model type
def receiver(sender, **kwargs):
    # Do something with blog posts
    pass

# Register listeners for each page model class
page_published.connect(receiver, sender=BlogPostPage)
```

Wagtail provides access to a list of registered page types through the `get_page_models()` function in `wagtail.wagtailcore.models`.

Read the [Django documentation](#) for more information about specifying senders.

## page\_unpublished

This signal is emitted from a Page when the page is unpublished.

**sender** The page class  
**instance** The specific Page instance.  
**kwargs** Any other arguments passed to `page_unpublished.send()`

## The project template

```
mysite/
    home/
        migrations/
            __init__.py
            0001_initial.py
            0002_create_homepage.py
        templates/
            home/
                home_page.html
            __init__.py
        models.py
    search/
        templates/
            search/
                search.html
        __init__.py
        views.py
mysite/
    settings/
        __init__.py
        base.py
        dev.py
        production.py
    static/
        css/
            mysite.css
        js/
            mysite.js
    templates/
        404.html
        500.html
        base.html
    __init__.py
    urls.py
    wsgi.py
    manage.py
    requirements.txt
```

### The “home” app

Location: `/mysite/home/`

This app is here to help get you started quicker by providing a `HomePage` model with migrations to create one when you first setup your app.

### Default templates and static files

Location: `/mysite/mysite/templates/` and `/mysite/mysite/static/`

The templates directory contains `base.html`, `404.html` and `500.html`. These files are very commonly needed on Wagtail sites to they have been added into the template.

The static directory contains an empty JavaScript and CSS file.

## Django settings

Location: `/mysite/mysite/settings/`

The Django settings files are split up into `base.py`, `dev.py`, `production.py` and `local.py`.

**base.py** This file is for global settings that will be used in both development and production. Aim to keep most of your configuration in this file.

**dev.py** This file is for settings that will only be used by developers. For example: `DEBUG = True`

**production.py** This file is for settings that will only run on a production server. For example: `DEBUG = False`

**local.py** This file is used for settings local to a particular machine. This file should never be tracked by a version control system.

---

**Tip:** On production servers, we recommend that you only store secrets in `local.py` (such as API keys and passwords). This can save you headaches in the future if you are ever trying to debug why a server is behaving badly. If you are using multiple servers which need different settings then we recommend that you create a different `production.py` file for each one.

---

## Support

### Mailing list

If you have general questions about Wagtail, or you're looking for help on how to do something that these documents don't cover, join the mailing list at [groups.google.com/d/forum/wagtail](https://groups.google.com/d/forum/wagtail).

### Issues

If you think you've found a bug in Wagtail, or you'd like to suggest a new feature, please check the current list at [github.com/torchbox/wagtail/issues](https://github.com/torchbox/wagtail/issues). If your bug or suggestion isn't there, raise a new issue, providing as much relevant context as possible.

### Torchbox

Finally, if you have a query which isn't relevant for either of the above forums, feel free to contact the Wagtail team at Torchbox directly, on [hello@wagtail.io](mailto:hello@wagtail.io) or [@wagtailcms](https://twitter.com/wagtailcms).

## Using Wagtail: an Editor's guide

This section of the documentation is written for the users of a Wagtail-powered site. That is, the content editors, moderators and administrators who will be running things on a day-to-day basis.

## Introduction

Wagtail is a new open source content management system (CMS) developed by Torchbox. It is built on the Django framework and designed to be super easy to use for both developers and editors.

This documentation will explain how to:

- navigate the main user interface of Wagtail
- create pages of all different types
- modify, save, publish and unpublish pages
- how to set up users, and provide them with specific roles to create a publishing workflow
- upload, edit and include images and documents
- ... and more!

## Getting started

### The Wagtail demo site

This examples in this document are based on [Torchbox.com](#). However, the instructions are general enough as to be applicable to any Wagtail site.

For the purposes of this documentation we will be using the URL, **www.example.com**, to represent the root (home-page) of your website.

### Logging in

- The first port of call for an editor is the login page for the administrator interface.
- Access this by adding **/admin** onto the end of your root URL (e.g. [www.example.com/admin](http://www.example.com/admin)).
- Enter your username and password and click **Sign in**.



## Finding your way around

This section describes the different pages that you will see as you navigate around the CMS, and how you can find the content that you are looking for.

## The Dashboard

The Dashboard provides information on:

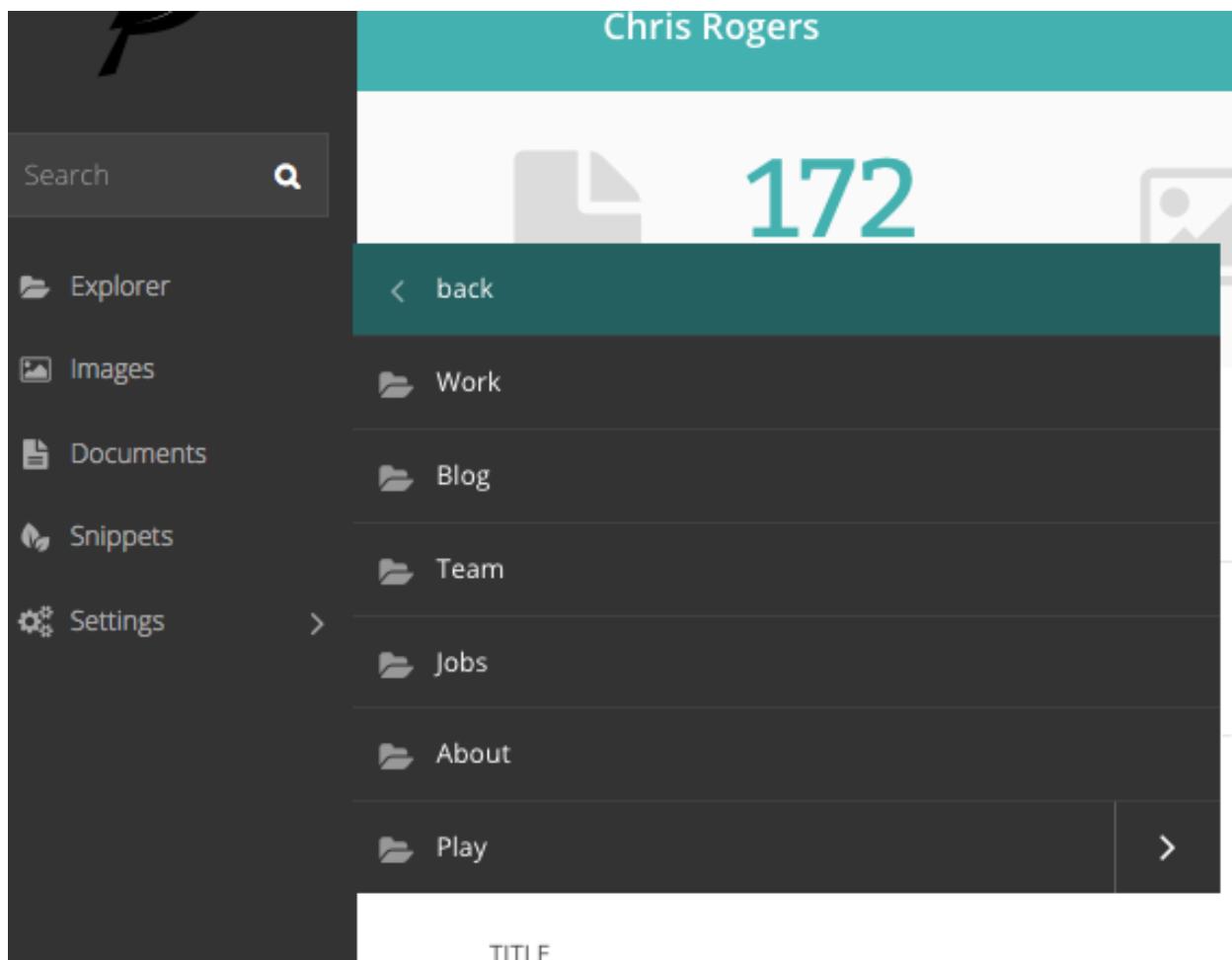
- The number of pages, images, and documents currently held in the Wagtail CMS
- Any pages currently awaiting moderation (if you have these privileges)
- Your most recently edited pages

You can return to the Dashboard at any time by clicking the Wagtail logo in the top-left of the screen.

The screenshot shows the Wagtail CMS Dashboard. On the left is a dark sidebar with a bird icon, a search bar, and links for Explorer, Images, Documents, Snippets, and Settings. The main area has a teal header with the text "Welcome to the torchbox.com Wagtail CMS" and the user's name "Chris Rogers". Below the header are three summary cards: "172 Pages" (with a document icon), "329 Images" (with a camera icon), and "0 Documents" (with a folder icon). Underneath these are two tables. The first table, titled "PAGES AWAITING MODERATION", has one row: "It's a blog page" under "TITLE", "Blog" under "PARENT", "Blog Page" under "TYPE", and "0 minutes ago by Chris Rogers" under "EDITED". The second table, titled "YOUR MOST RECENT EDITS", also has one row: "It's a standard page" under "TITLE", "0 minutes ago" under "DATE", and "DRAFT" under "STATUS". At the bottom left of the dashboard is a user profile icon and the text "Chris Rogers".

- Clicking the logo returns you to your Dashboard.
- The stats at the top of the page describe the total amount of content on the CMS (just for fun!).
- The *Pages awaiting moderation* table will only be displayed if you have moderator or administrator privileges
  - Clicking the name of a page will take you to the ‘Edit page’ interface for this page.
  - Clicking approve or reject will either change the page status to live or return the page to draft status. An email will be sent to the creator of the page giving the result of moderation either way.
  - The *Parent* column tells you what the parent page of the page awaiting moderation is called. Clicking the parent page name will take you to its Edit page.
- The *Your most recent edits* table displays the five pages that you most recently edited.
- The date column displays the date that you edited the page. Hover your mouse over the date for a more exact time/date.
- The status column displays the current status of the page. A page will have one of three statuses:
  - Live: Published and accessible to website visitors
  - Draft: Not live on the website.
  - Live + Draft: A version of the page is live, but a newer version is in draft mode.

## The Explorer menu



- Click the Explorer button in the sidebar to open the site explorer. This allows you to navigate through the tree-structure of the site.
- Clicking the name of a page will take you to the Explorer page for that section (see below). NOTE: The site explorer only displays pages which themselves have child pages. To see and edit the child pages you should click the name of the parent page in the site explorer.
- Clicking the green arrow displays the sub-sections (see below).
- Clicking the back button takes you back to the parent section.
- Again, clicking the section title takes you to the Explorer page.
- Clicking further arrows takes you deeper into the tree.

## Using search

The screenshot shows the Wagtail search interface. At the top, there is a teal header bar with a search icon and the word "SEARCH". Below it is a search bar containing the text "wagt". The main area has a light gray background and displays the message "THERE ARE 8 MATCHING PAGES". Below this, there is a navigation bar with tabs: "OTHER SEARCHES" (which is selected and highlighted in gray), "Images", "Documents", and "Users". The main content area is a table with the following columns: TITLE, PARENT, UPDATED, TYPE, and STATUS. There are three rows of search results:

TITLE	PARENT	UPDATED	TYPE	STATUS
Wagtail	Work	6 months, 1 week ago	Work Page	<span>LIVE</span>
Wagtail in one line	Blog	6 months, 1 week ago	Blog Page	<span>LIVE</span>
Meet Wagtail, our new CMS	Blog	6 months, 1 week ago	Blog Page	<span>LIVE</span>

- A very easy way to find the page that you want is to use the main search feature, accessible from the left-hand menu.
- Simply type in part or all of the name of the page you are looking for, and the results below will automatically update as you type.
- Clicking the page title in the results will take you to the Edit page for that result. You can differentiate between similar named pages using the Parent column, which tells you what the parent page of that page is.

## The Explorer page

The Explorer page allows you to view the a page's children and perform actions on them. From here you can publish/unpublish pages, move pages to other sections, drill down further into the content tree, or reorder pages under the parent for the purposes of display in menus.

The screenshot shows the Wagtail Torchbox interface. At the top, there's a toolbar with buttons for EDIT, LIVE, MOVE, DELETE, UNPUBLISH, and ADD CHILD PAGE. To the right of the toolbar are the page details: '4 months, 1 week ago' (last updated), 'Homepage' (page title), 'Privacy PUBLIC' (privacy settings), and a 'LIVE' status indicator. Below the toolbar is a search bar with the placeholder 'TITLE' and filters for 'UPDATED' (sorted by last update), 'TYPE' (sorted by type), and 'STATUS' (sorted by status). The main content area displays two child pages under the 'Work' section: 'Jobs' (status LIVE) and 'Work' (status LIVE). Each page item includes a timestamp ('1 week, 5 days ago' for Work, '1 month, 3 weeks ago' for Jobs), the page title, its type ('Index Page'), and a 'LIVE' status indicator. To the right of each page item is a green right-pointing arrow icon.

- The name of the section you are looking at is displayed below the breadcrumb (the row of page names beginning with the home icon). Each section is also itself a page (in this case the homepage). Clicking the title of the section takes you to the Edit screen for the section page.
- As the heading suggests, below are the child pages of the section. Clicking the titles of each child page will take you to its Edit screen.

The screenshot shows the Wagtail Explorer interface. At the top, there are dropdown menus for 'TYPE' and 'STATUS'. Below them, a list of pages is shown. The first item is 'Standard Index' (status LIVE), which has a large green right-pointing arrow icon next to it. Below this item are two smaller arrows pointing right, indicating further levels of child pages. At the bottom of the list are two more items: 'Standard Page' (status LIVE) and another small green right-pointing arrow icon.

- Clicking the arrows will display a further level of child pages.

The screenshot shows a Wagtail website page. At the top, there's a breadcrumb navigation bar with icons for home, 'Homepage', and 'Schools & Programmes'. Below the breadcrumb, the page title 'School of Fine Art' is displayed in a large, bold, white font against a teal background.

- As you drill down through the site the breadcrumb (the row of pages beginning with the home icon) will display the path you have taken. Clicking on the page titles in the breadcrumb will take you to the Explorer screen for that page.

The screenshot shows the Wagtail admin interface for a page titled 'School of Fine Art'. Below the title are several buttons: 'EDIT', 'LIVE', 'MOVE', 'DELETE', 'UNPUBLISH', a plus sign icon, and 'ADD CHILD PAGE'. The 'ADD CHILD PAGE' button is highlighted with a dark background.

- To add further child pages press the Add child page button below the parent page title. You can view the parent page on the live site by pressing the View live button. The Move button will take you to the Move page screen where you can reposition the page and all its child pages in the site structure.
- Similar buttons are available for each child page. These are made visible on hover.

### Reordering pages

The screenshot shows a list of pages under a parent category. At the top, there's a header with a downward arrow icon and the word 'TITLE'. Below it, two items are listed: 'Painting' and 'Photography'. Each item has a vertical list of three dots on its left side, which likely serves as a handle for dragging and reordering.

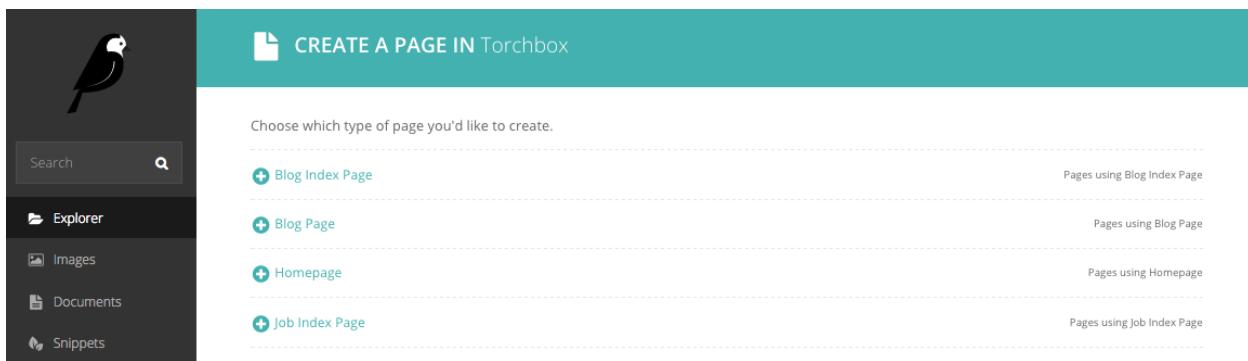
- Clicking the icon to the far left of the child pages table will enable the reordering handles. This allows you to reorder the way that content displays in the main menu of your website.
- Reorder by dragging the pages by the handles on the far left (the icon made up of 6 dots).
- Your new order will be automatically saved each time you drag and drop an item.

### Creating new pages

The screenshot shows the Wagtail admin interface for a page titled 'School of Fine Art'. Below the title are several buttons: 'EDIT', 'LIVE', 'MOVE', 'DELETE', 'UNPUBLISH', a plus sign icon, and 'ADD CHILD PAGE'. The 'ADD CHILD PAGE' button is highlighted with a dark background.

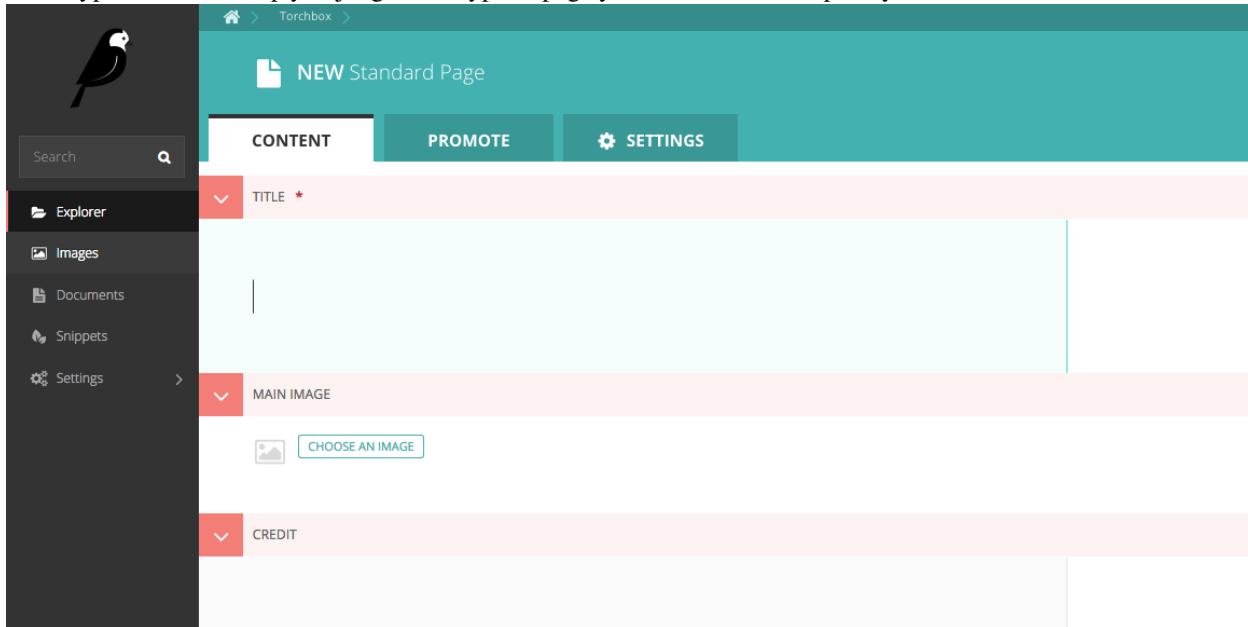
Create new pages by clicking the **Add child page** button. This creates a child page of the section you are currently in. In this case a child page of the 'School of Fine Art' page.

### Selecting a page type



The screenshot shows the Wagtail admin interface for creating a new page. On the left is a dark sidebar with a parrot icon, a search bar, and links for Explorer, Images, Documents, Snippets, and Settings. The main area has a teal header 'CREATE A PAGE IN Torchbox'. Below it, a message says 'Choose which type of page you'd like to create.' A list of page types is shown with small icons: 'Blog Index Page' (with 'Pages using Blog Index Page' link), 'Blog Page' (with 'Pages using Blog Page' link), 'Homepage' (with 'Pages using Homepage' link), and 'Job Index Page' (with 'Pages using Job Index Page' link).

- On the left of the page chooser screen are listed all the types of pages that you can create. Clicking the page type name will take you to the Create new page screen for that page type (see below).
- Clicking the *Pages using ... Page* links on the right will display all the pages that exist on the website of this type. This is to help you judge what type of page you will need to complete your task.



The screenshot shows the Wagtail 'NEW Standard Page' creation screen. The left sidebar is identical to the previous screenshot. The main area has a teal header 'NEW Standard Page' with tabs for 'CONTENT', 'PROMOTE', and 'SETTINGS'. Under 'CONTENT', there are three fields: 'TITLE \*' (with a red dropdown arrow), 'MAIN IMAGE' (with a 'CHOOSE AN IMAGE' button), and 'CREDIT' (with a red dropdown arrow). The 'CONTENT' tab is currently selected.

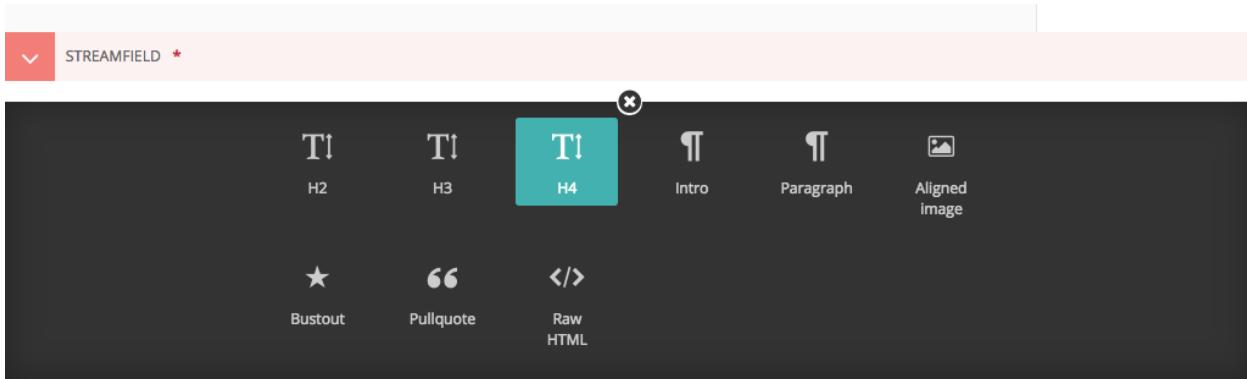
- Once you've selected a page type you will be presented with a blank New page screen.
- Click into the areas below each field's heading to start entering content.

### Creating page body content

Wagtail supports a number of basic fields for creating content, as well as our unique StreamField feature which allows you to construct complex layouts by combining these basic fields in any order.

#### StreamField

StreamField allows you to create complex layouts of content on a page by combining a number of different arrangements of content, ‘blocks’, in any order.



When you first edit a page, you will be presented with the empty StreamField area, with the option to choose one of several block types. The block types on your website may be different from the screenshot here, but the principles are the same.

Click the block type, and the options will disappear, revealing the entry field for that block.

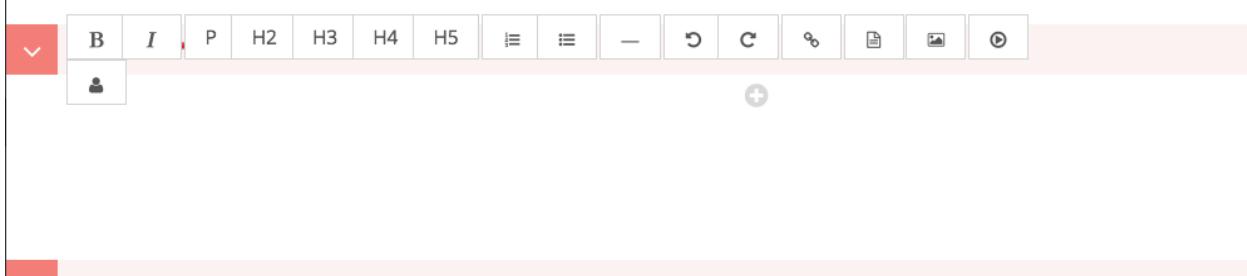
Depending on the block you chose, the field will display differently, and there might even be more than one field! There are a few common field types though that we will talk about here.

- Basic text field
- Rich text field
- Image field

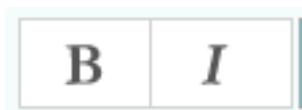
**Basic text field** Basic text fields have no formatting options. How these display will be determined by the style of the page in which they are being inserted. Just click into the field and type!

**Rich text fields** Most of the time though, you need formatting options to create beautiful looking pages. So some fields, like the fields in the ‘Paragraph block’ shown in the screenshot, have many of the options you would expect from a word processor. These are referred to as rich text fields.

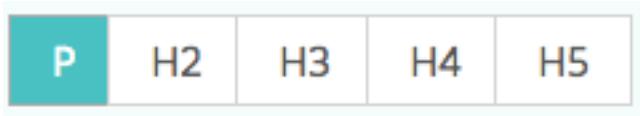
So, when you click into one of these fields, you will be presented with a set of tools which allow you to format and style your text. These tools also allow you to insert links, images, videos clips and links to documents.



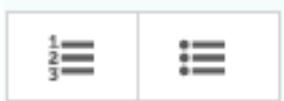
Below is a summary of what the different buttons represent:



**Bold / Italic:** Either click then type for bold or italic, or highlight and select to convert existing text to bold or italic.



**Paragraph / heading levels:** Clicking into a paragraph and selecting one of these options will change the level of the text. H1 is not included as this is reserved for the page title.



### Bulleted and numbered lists



**Horizontal rule:** Creates a horizontal line at the position of the cursor. If inserted inside a paragraph it will split the paragraph into two separate paragraphs.



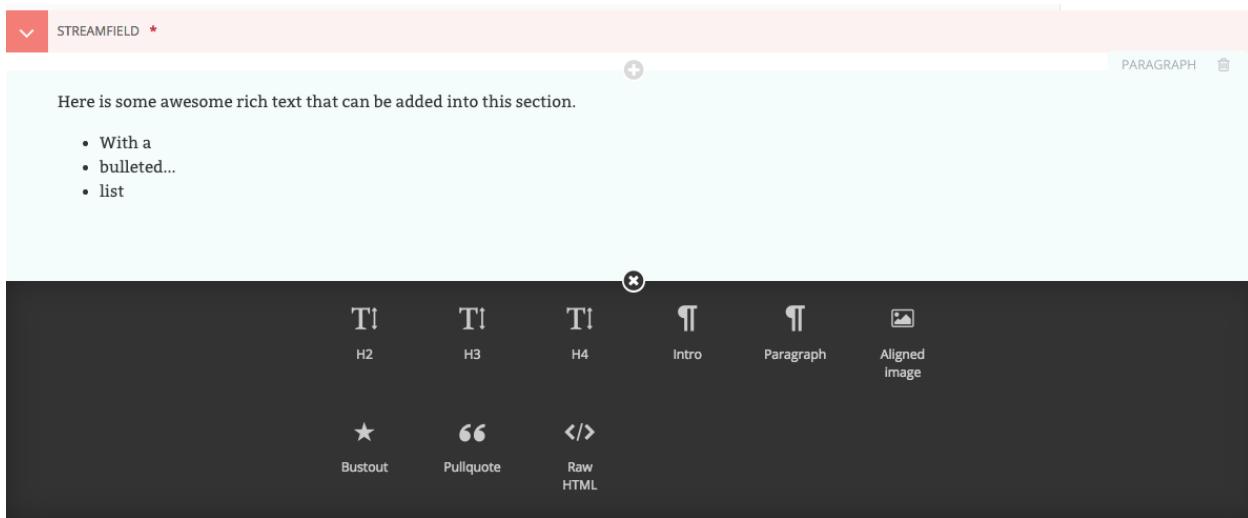
**Undo / redo:** As expected will undo or redo the latest actions. Never use your browser's back button when attempting to undo changes as this could lead to errors. Either use this undo button, or the usual keyboard shortcut, CTRL+Z.



**Insert image / video:** Allows you to insert an image or video into the rich text field. See Inserting images and videos section for more details. See *Inserting images <inserting\_images.html>* and *Inserting videos <inserting\_videos.html>* sections.

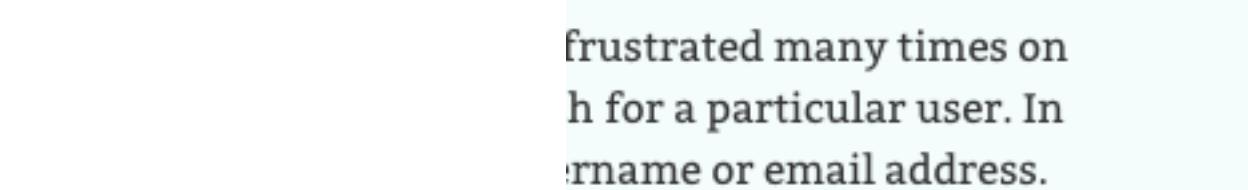


**Insert link / document:** Allows you to insert a link or a document into the rich text field. See Inserting links and Inserting documents for more details. See *Inserting links section <inserting\_links.html>*.



### Adding further blocks in StreamField

- To add new blocks, click the ‘+’ icons above or below the existing blocks.
- You’ll then be presented once again with the different blocks from which you may choose.
- You can cancel the addition of a new block by clicking the cross at the top of the block selection interface.



### Reordering and deleting content in StreamField

- Click the arrows on the right-hand side of each block to move blocks up and down in the StreamField order of content.
- The blocks will be displayed in the front-end in the order that they are placed in this interface.
- Click the rubbish bin on the far right to delete a field

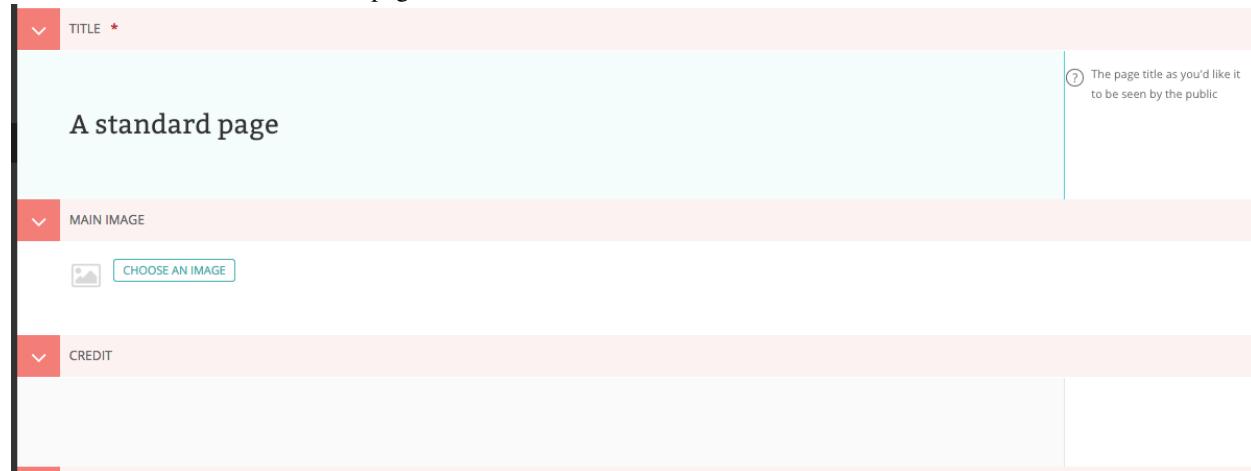
**Warning:** Once a StreamField field is deleted it cannot be retrieved if the page has not been saved. Save your pages regularly so that if you accidentally delete a field you can reload the page to undo your latest edit.

### Inserting images and videos in a page

There will obviously be many instances in which you will want to add images to a page. There are two main ways to add images to pages, either via a specific image chooser field, or via the rich text field image button. Which of these you use will be dependent on the individual setup of your site.

### Inserting images using the image chooser field

Often a specific image field will be used for a main image on a page, or for an image to be used when sharing the page on social media. For the standard page on Torchbox.com, the former is used.



- You insert an image by clicking the *Choose an image* button.

### Choosing an image to insert

You have two options when selecting an image to insert:

1. Selecting an image from the existing image library, or...
2. Uploading a new image to the CMS

When you click the *Choose an image* button you will be presented with a pop-up with two tabs at the top. The first, *Search*, allows you to search and select from the library. The second, *Upload*, allows you to upload a new image.

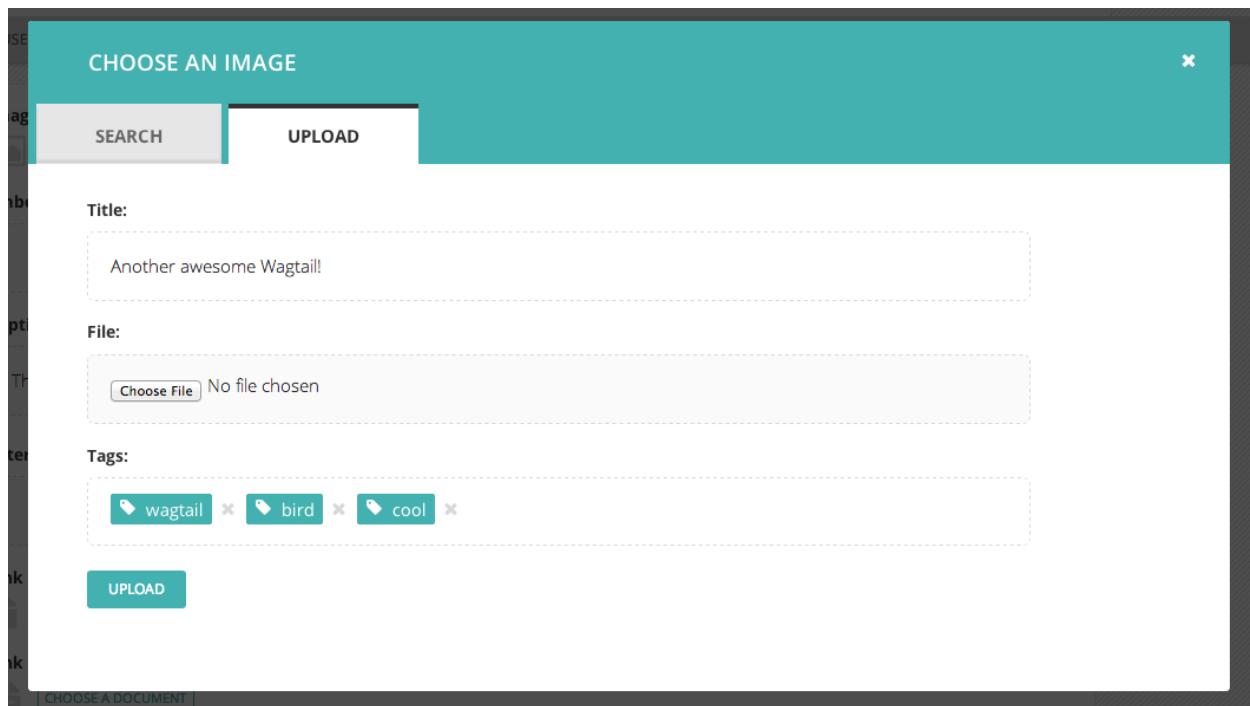
### Choosing an image from the image library

The image below demonstrates finding and inserting an image that is already present in the CMS image library.

The screenshot shows the Wagtail image search interface. At the top, a teal header bar contains the text "CHOOSE AN IMAGE" with a camera icon, a close button "X", and two buttons: "SEARCH" and "UPLOAD". Below the header is a search bar with the placeholder "Search term:" and a "Search" button. Underneath the search bar is a row of "Popular tags" represented by small icons and text: Facilities, sculpture, painting, photography, fine\_art, textiles, art, Architecture, Research, and Wallpaper. Below these tags is a section titled "LATEST IMAGES" containing three image thumbnails. The first thumbnail is a black and white photo of a man sitting on a log holding a sign that says "No Trees". The second thumbnail is a dark image with the "TEDxAmsterdam" logo. The third thumbnail is a screenshot of a computer screen displaying a microsite for "Critical Writing in Art & Design".

1. Typing into the search box will automatically display the results below.
2. Clicking one of the Popular tags will filter the search results by that tag.
3. Clicking an image will take you to the Choose a format window (see image below).

#### Uploading a new image to the CMS



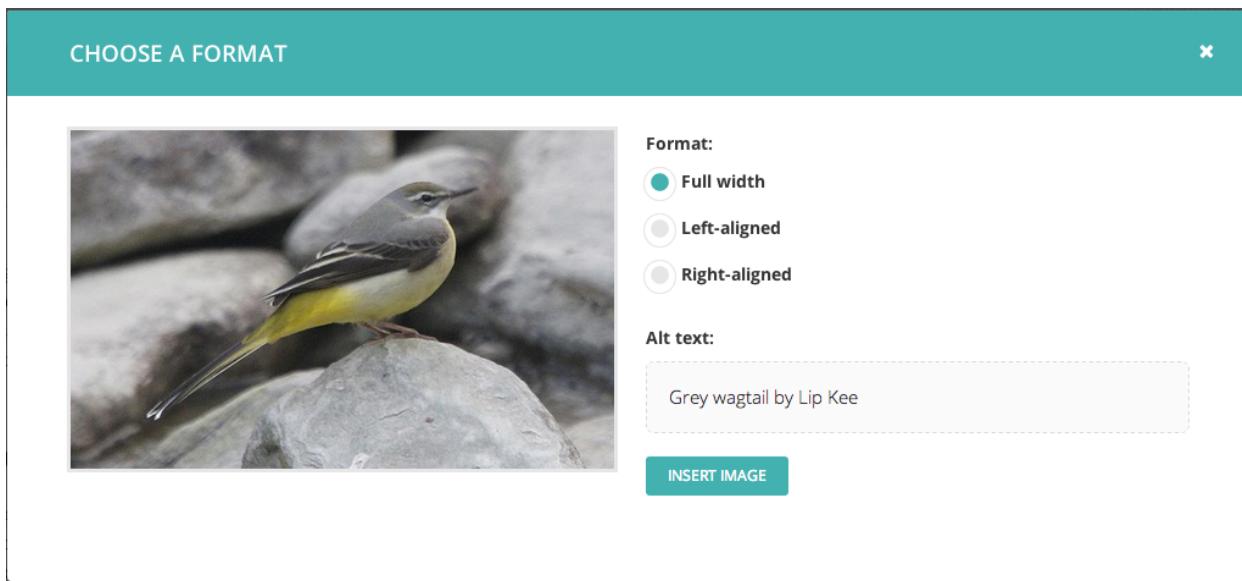
1. You must include an image title for your uploaded image
2. Click the *Choose file* button to choose an image from your computer.
3. *Tags* allows you to associate tags with the image you are uploading. This allows them to be more easily found when searching. Each tag should be separated by a space. Good practice for creating multiple word tags is to use an underscore between each word (e.g. western\_yellow\_wagtail).
4. Click *Upload* to insert the uploaded image into the carousel. The image will also be added to the main CMS image library for reuse in other content.

### Inserting images using the rich text field



Images can also be inserted into the body text of a page via the rich text editor. When working in a rich text field, click the image illustrated above. You will then be presented with the same options as for inserting images into the main carousel.

In addition, Wagtail allows you to choose an alignment for your image.



1. You can select how the image is displayed by selecting one of the format options.
2. You must provide specific alt text for your image.

The alignments available are described below:

- **Full width:** Image will be inserted using the full width of the text area.
- **Half-width left/right aligned:** Inserts the image at half the width of the text area. If inserted in a block of text the text will wrap around the image. If two half-width images are inserted together they will display next to each other.

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**Note:** The display of images aligned in this way is dependent on your implementation of Wagtail, so you may get slightly different results.

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## Inserting links in a page

Similar to images, there are a variety of points at which you will want to add links. The most common place to insert a link will be in the body text of a page. You can insert a link into the body text by clicking the **Insert link** button in the rich text toolbar.

Whichever way you insert a link, you will be presented with the form displayed below.

The screenshot shows a teal header bar with a document icon, the text 'CHOOSE A PAGE', a search bar with a magnifying glass icon and the placeholder 'Search', and a close button ('X'). Below the header, there are three links: 'Internal link', 'External link', and 'Email link'. The main area is titled 'EXPLORER' and shows a breadcrumb trail: a house icon > 'Homepage' >. Below this is a table with columns 'TITLE', 'TYPE', and 'STATUS'. It lists three items:

TITLE	TYPE	STATUS
Schools & Programmes	Standard Index	LIVE
School of Architecture	School Page	LIVE
School of Communication	School Page	LIVE

Each row has a green right-pointing arrow icon to its right.

- Search for an existing page to link to using the search bar at the top of the pop-up.
- Below the search bar you can select the type of link you want to insert. The following types are available:
  - Internal link: A link to an existing page within your website.
  - External link: A link to a page on another website.
  - Email link: A link that will open the user's default email client with the email address prepopulated.
- You can also navigate through the website to find an internal link via the explorer.

### Inserting videos into body content

As well as inserting videos into a carousel, Wagtail's rich text fields allow you to add videos into the body of a page by clicking the *Add video* button in the toolbar.

The screenshot shows a teal header bar with the text 'INSERT EMBED' and a close button ('X'). Below the header is a form field with a red asterisk next to the label 'URL:'. The URL 'https://vimeo.com/86036070' is entered into the field. At the bottom left is a teal 'INSERT' button.

- Copy and paste the web address for the video (either YouTube or Vimeo) into the URL field and click Insert.

## Wagtail: A new Django CMS

URL: <http://www.vimeo.com/86036070>

Provider: Vimeo

Author: Torchbox



- A placeholder with the name of the video and a screenshot will be inserted into the text area. Clicking the X in the top corner will remove the video.

### Inserting links to documents into body text



It is possible to insert links to documents held in the CMS into the body text of a web page by clicking the button above in the rich text field.

The process for doing this is the same as when inserting an image. You are given the choice of either choosing a document from the CMS, or uploading a new document.

The screenshot shows the Wagtail 'Choose a Document' interface. At the top, there's a teal header with the title 'CHOOSE A DOCUMENT' and a close button ('X'). Below the header are two buttons: 'SEARCH' (white background) and 'UPLOAD' (teal background). Underneath these buttons is a search form with a 'Search term:' label and a 'Search' button. The main area is titled 'LATEST DOCUMENTS' and contains a table with three columns: 'TITLE', 'FILE', and 'UPLOADED'. The table lists three documents:

TITLE	FILE	UPLOADED
Special Project Coordinator Info Pack	Special_Projects_Coordinator_Information_Pack_0514_1.pdf	2 months, 2 weeks ago
Senior Tutor in Mixed Media Information Pack	Senior_Tutor_in_Mixed_Media_Information_Pack_0514_1.pdf	2 months, 3 weeks ago
Senior Tutor in Mixed Media	(file removed)	2 months,

### Adding multiple items

A common feature of Wagtail is the ability to add more than one of a particular type of field or item. For example, you can add as many carousel items or related links as you wish.



- Whenever you see the white cross in the green circle illustrated here it means you can add multiple objects or items to a page. Clicking the icon will display the fields required for that piece of content. The image below demonstrates this with a *Related link* item.

RELATED LINKS

**Link:**  [trash]

**External link:**  [trash]

**Link text:**  [trash]

Link title (or leave blank to use page title)

**+ ADD RELATED LINKS**

- You can delete an individual item by pressing the trash can in the top-right.
- You can add more items by clicking the link with the white cross again.

**Link:**  [trash]

**CLEAR CHOICE** **CHOOSE ANOTHER PAGE**

**↑ ↓ [trash]**

- You can reorder your multiple items using the up and down arrows. Doing this will affect the order in which they are display on the live page.

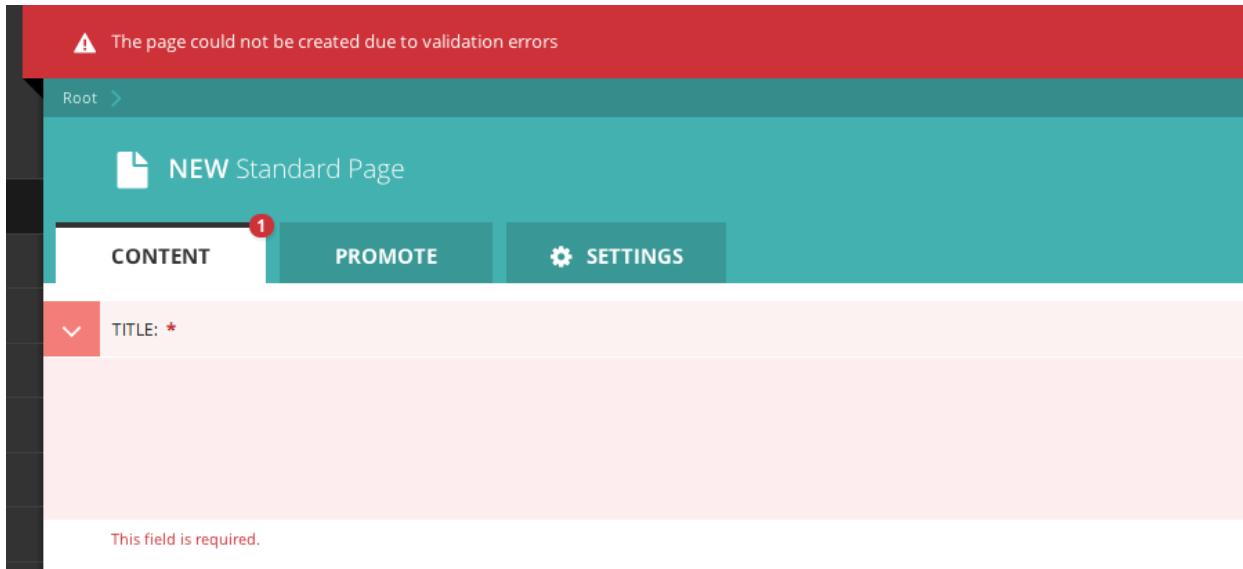
## Required fields

- Fields marked with an asterisk are required. You will not be able to save a draft or submit the page for moderation without these fields being completed.

**TITLE: \***

The title is required!

- If you try to save/submit the page with some required fields not filled out, you will see the error displayed here.
- The number of validation errors for each of the *Promote* and *Content* tabs will appear in a red circle, and the text, 'This field is required', will appear below each field that must be completed.

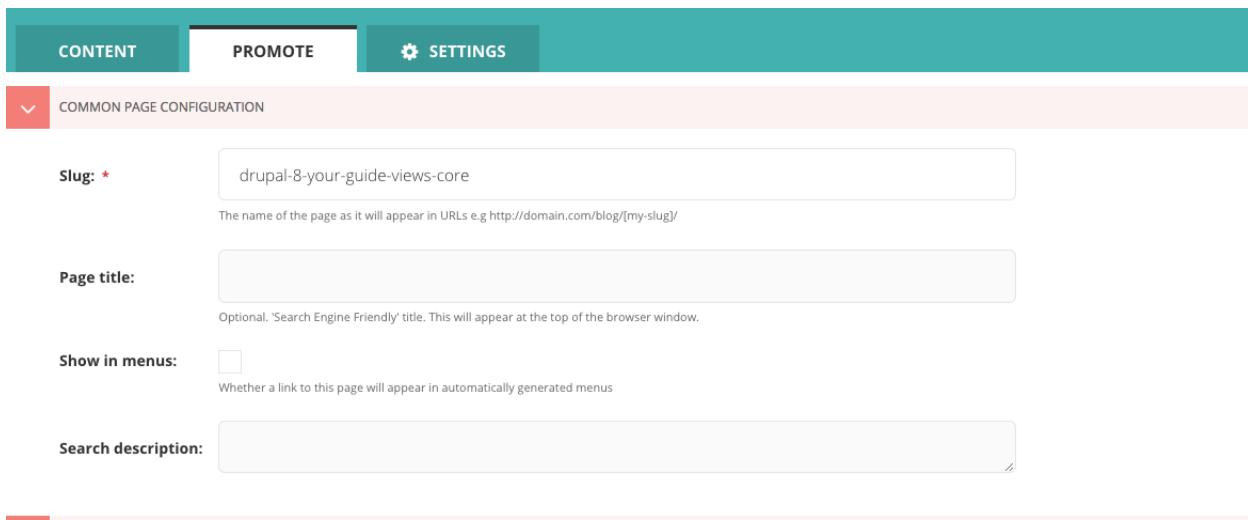


### The Promote tab

A common feature of the *Edit* pages for all page types is the two tabs at the top of the screen. The first, Content, is where you build the content of the page itself.

The second, *Promote*, is where you can set all the ‘metadata’ (data about data!) for the page. Below is a description of all default fields in the promote tab and what they do.

- **Slug:** The last part of the web address for the page. E.g. the slug for a blog page called ‘The best things on the web’ would be the-best-things-on-the-web ([www.example.com/blog/the-best-things-on-the-web](http://www.example.com/blog/the-best-things-on-the-web)). This is automatically generated from the main page title set in the Content tab. This can be overridden by adding a new slug into the field. Slugs should be entirely lowercase, with words separated by hyphens (-).
- **Page title:** An optional, search-engine friendly page title. This is the title that appears in the tab of your browser window. It is also the title that would appear in a search engine if the page was returned as part of a set of search results.
- **Show in menus:** Ticking this box will ensure that the page is included in automatically generated menus on your site. Note: Pages will only display in menus if all of its parent pages also have *Show in menus* ticked.
- **Search description:** This field allows you to add text that will be displayed if the page appears in search results. This is especially useful to distinguish between similarly named pages.




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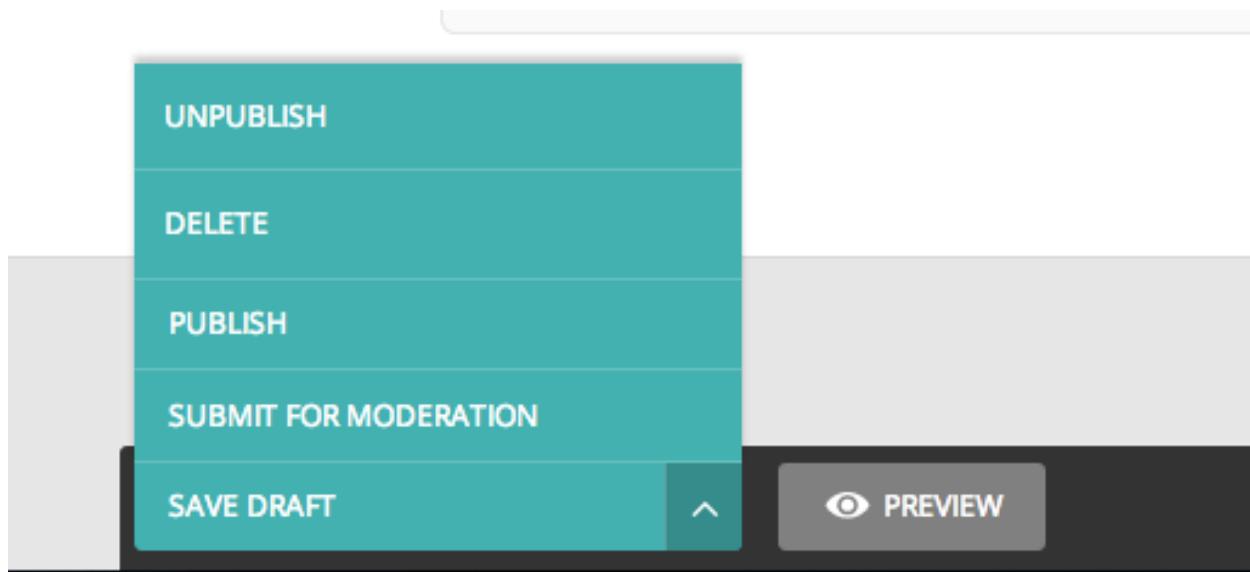
**Note:** You may see more fields than this in your promote tab. These are just the default fields, but you are free to add other fields to this section as necessary.

---

## Previewing and submitting pages for moderation

The Save/Preview/Submit for moderation menu is always present at the bottom of the page edit/creation screen. The menu allows you to perform the following actions, dependent on whether you are an editor, moderator or administrator:

- **Save draft:** Saves your current changes but doesn't submit the page for moderation and so won't be published. (all roles)
- **Submit for moderation:** Saves your current changes and submits the page for moderation. A moderator will be notified and they will then either publish or reject the page. (all roles)
- **Preview:** Opens a new window displaying the page as it would look if published, but does not save your changes or submit the page for moderation. (all roles)
- **Publish/Unpublish:** Clicking either the *Publish* or *Unpublish* buttons will take you to a confirmation screen asking you to confirm that you wish to publish or unpublish this page. If a page is published it will be accessible from its specific URL and will also be displayed in site search results. (moderators and administrators only)
- **Delete:** Clicking this button will take you to a confirmation screen asking you to confirm that you wish to delete the current page. Be sure that this is actually what you want to do, as deleted pages are not recoverable. In many situations simply unpublishing the page will be enough. (moderators and administrators only)



## Editing existing pages

There are two ways that you can access the edit screen of an existing page:

- Clicking the title of the page in an [Explorer page](#) or in [search results](#).
- Clicking the *Edit* link below the title in either of the situations above.

The screenshot shows the Wagtail edit interface for a blog page. The top navigation bar shows the path: Home > Torchbox > Blog >. The main title of the page is "Django: A guide to upgrading your application". On the right side, there are status indicators: Status (LIVE), Privacy (PUBLIC), and Edit lock (UNLOCKED). Below the title, there are three tabs: CONTENT (selected), PROMOTE, and SETTINGS. The CONTENT tab contains a form field for "TITLE" with the value "Django: A guide to upgrading your application". A tooltip for the title field explains: "The page title as you'd like it to be seen by the public". The AUTHOR field shows "Neal Todd" as the author, with options to "CLEAR CHOICE", "CHOOSE ANOTHER PAGE", and "EDIT THIS PAGE". At the bottom, there are "SAVE DRAFT" and "PREVIEW" buttons, along with a note indicating the page was last modified on June 4, 2015, at 12:10 p.m. by Rob Carter.

- When editing an existing page the title of the page being edited is displayed at the top of the page.

- The current status of the page is displayed in the top-right.
- You can change the title of the page by clicking into the title field.
- When you are typing into a field, help text is often displayed on the right-hand side of the screen.

## Managing documents and images

Wagtail allows you to manage all of your documents and images through their own dedicated interfaces. See below for information on each of these elements.

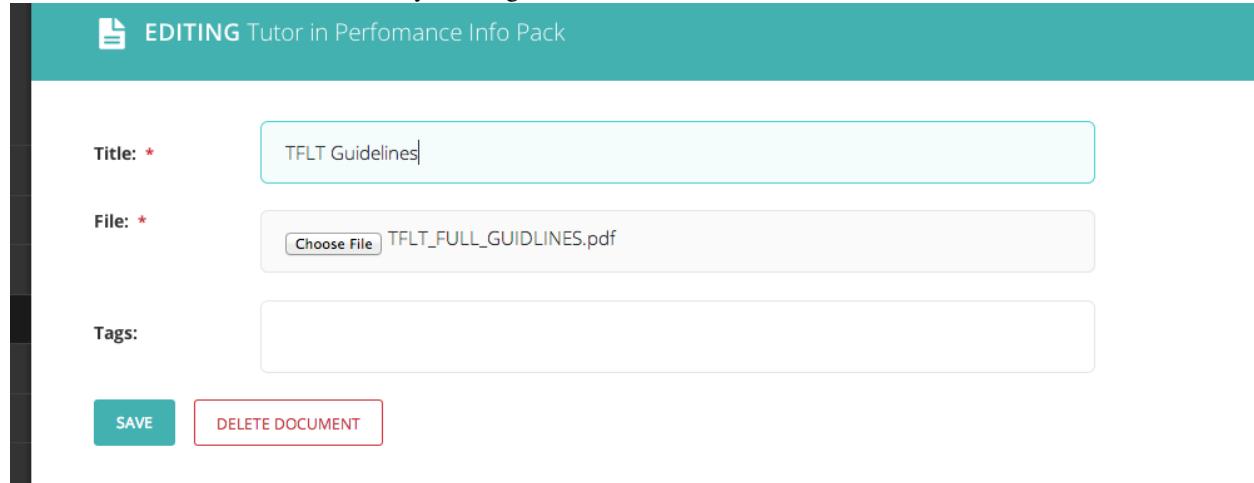
### Documents

Documents such as PDFs can be managed from the Documents interface, available in the left-hand menu. This interface allows you to add documents to and remove documents from the CMS.



TITLE	FILE	UPLOADED
Special Project Coordinator Info Pack	Special_Projects_Coordinator_Information_Pack_0514_1.pdf	2 months, 2 weeks ago
Senior Tutor in Mixed Media Information Pack	Senior_Tutor_in_Mixed_Media_Information_Pack_0514_1.pdf	2 months, 3 weeks ago
Senior Tutor in Mixed Media Information Pack	Senior_Tutor_in_Mixed_Media_Information_Pack_0514.pdf	2 months, 3 weeks ago
Senior Tutor in Printed Textiles Information Pack	Senior_Tutor_in_Printed_Textiles_Information_Pack_0514.pdf	2 months, 3 weeks ago

- Add documents by clicking the *Add document* button in the top-right.
- Search for documents in the CMS by entering your search term in the search bar. The results will be automatically updated as you type.
- You can also filter the results by *Popular tags*. Click on a tag to update the search results listing.
- Edit the details of a document by clicking the document title.



The screenshot shows the Wagtail document editing interface. At the top, it says "EDITING Tutor in Perfomance Info Pack". Below that, there are three input fields: "Title: \* TFLT Guidelines", "File: \* Choose File TFLT\_FULL\_GUIDLINES.pdf", and "Tags: (empty)". At the bottom, there are two buttons: "SAVE" and "DELETE DOCUMENT".

- When editing a document you can replace the file associated with that document record. This means you can update documents without having to update the pages on which they are placed. Changing the file will change it on all pages that use the document.

- Add or remove tags using the Tags field.
- Save or delete documents using the buttons at the bottom of the interface.

**Warning:** Deleted documents cannot be recovered.

## Images

If you want to edit, add or remove images from the CMS outside of the individual pages you can do so from the Images interface. This is accessed from the left-hand menu.

The screenshot shows the Wagtail Images interface. At the top, there's a teal header bar with the word "IMAGES" on the left, a search bar in the center containing "Search images", and a button on the right labeled "+ ADD AN IMAGE". Below the header is a section titled "LATEST IMAGES" containing a 3x4 grid of image thumbnails. Each thumbnail includes a caption below it. The images are as follows:

Image	Caption
	The best Wagtail!
	Grey wagtail by Lip Kee
	Wagtail collects insects by Margrit
	Hopalong wagtail by Ruth Flickr
	Wagtail Sproing by Jim Bendon
	Wagtail at Borovoye, Kazakhstan by Ken and Nyetta
	Pied wagtail by Marie Hale
	White wagtail by Koshy Koshy

- Clicking an image will allow you to edit the data associated with it. This includes the Alt text, the photographers credit, the medium of the subject matter and much more.

**Warning:** Changing the alt text here will alter it for all occurrences of the image in carousels, but not in inline images, where the alt text can be set separately.

**EDITING** django\_upgraded.jpg

Used 1 time

**Title:** \* django\_upgraded.jpg

**File:** \* django\_upgraded.jpg (1548x908)  
Change image file:  No file chosen  
Supported formats: GIF, JPEG, PNG. Maximum filesize: 10.0 MB.

**Credit:** Gordon Tarpley <https://www.flickr.com/photos/>

**Tags:**

**Focal point (optional)**  
To define this image's most important region, drag a box over the image below.

**MAX DIMENSIONS**  
1548x908

**FILESIZE**  
650.4 KB

**SAVE** **DELETE IMAGE**

## Changing the image

- When editing an image you can replace the file associated with that image record. This means you can update images without having to update the pages on which they are placed.

**Warning:** Changing the file will change it on all pages that use the image.

## Focal point

- This interface allows you to select a focal point which can effect how your image displays to visitors on the front-end.
- If your images are cropped in some way to make them fit to a specific shape, then the focal point will define the centre point from which the image is cropped.
- To set the focal point, simply drag a marquee around the most important element of the image.
- If the feature is set up in your website, then on the front-end you will see the crop of this image focusing on your selection.

## Snippets

Snippets allow you to create elements on a website once and reuse them in multiple places. Then, if you want to change something on the snippet, you only need to change it once, and it will change across all the occurrences of the snippet.

How snippets are used can vary widely between websites. Here are a few examples of things Torchbox have used snippets for on our clients' websites:

- For staff contact details, so that they can be added to many pages but managed in one place
- For Adverts, either to be applied sitewide or on individual pages
- To manage links in a global area of the site, for example in the footer

- For Calls to Action, such as Newsletter signup blocks, that may be consistent across many different pages

### The Snippets menu

The screenshot shows a teal header bar with a leaf icon and the word 'SNIPPETS'. Below it is a table with four rows. Each row has a label on the left and a description on the right.

Adverts	Boxed text links displayed in the sidebar. Applied globally or on individual pages. Usable on all pages.
Contact snippets	Displayed in main body. Usable on standard index page only.
Custom content modules	Navigational content for index pages. A series of images in rows of three with titles and links, displayed in main body. Usable only on standard index page
Reusable text snippets	Rich text field with title. Displayed in main body. Usable only on standard page and job page.

- You can access the Snippets menu by clicking on the ‘Snippets’ link in the left-hand menu bar.
- To add or edit a snippet, click on the snippet type you are interested in (often help text will be included to help you in selecting the right type)
- Click on an individual snippet to edit, or click ‘Add ...’ in the top right to add a new snippet

**Warning:** Editing a snippet will change it on all of the pages on which it has been used. In the top-right of the Snippet edit screen you will see a label saying how many times the snippet has been used. Clicking this label will display a listing of all of these pages.

The screenshot shows a teal header bar with a leaf icon and the text 'EDITING Anonymous Company Facebook'. To the right is a 'Used 11 times' button. Below the header is a form with a red border. The first field is labeled 'TITLE: \*'.

### Adding snippets whilst editing a page

If you are editing a page, and you find yourself in need of a new snippet, do not fear! You can create a new one without leaving the page you are editing:

- Whilst editing the page, open the snippets interface in a new tab, either by Ctrl+click (cmd+click on Mac) or by right clicking it and selecting ‘Open in new tab’ from the resulting menu.
- Add the snippet in this new tab as you normally would.
- Return to your existing tab and reopen the Snippet chooser window.
- You should now see your new snippet, even though you didn’t leave the edit page.

**Note:** Even though this is possible, it is worth saving your page as a draft as often as possible, to avoid your changes being lost by navigating away from the edit page accidentally.

## Managing Redirects

### About redirects

When dealing with publishing and unpublishing pages you will eventually need to make redirects. A redirect ensures that when a page is no longer available (404), the visitor and search engines are sent to a new page. Therefore the visitor won't end up in a breaking journey which would result in a page not found.

Wagtail considers two types of configurable redirects depending on whether *Permanent* is checked or not:

- Permanent redirect (checked by default)
- Temporary redirect

For both redirects the visitor won't experience a difference when visiting a page, but the search engine will react to these two type of redirects differently.

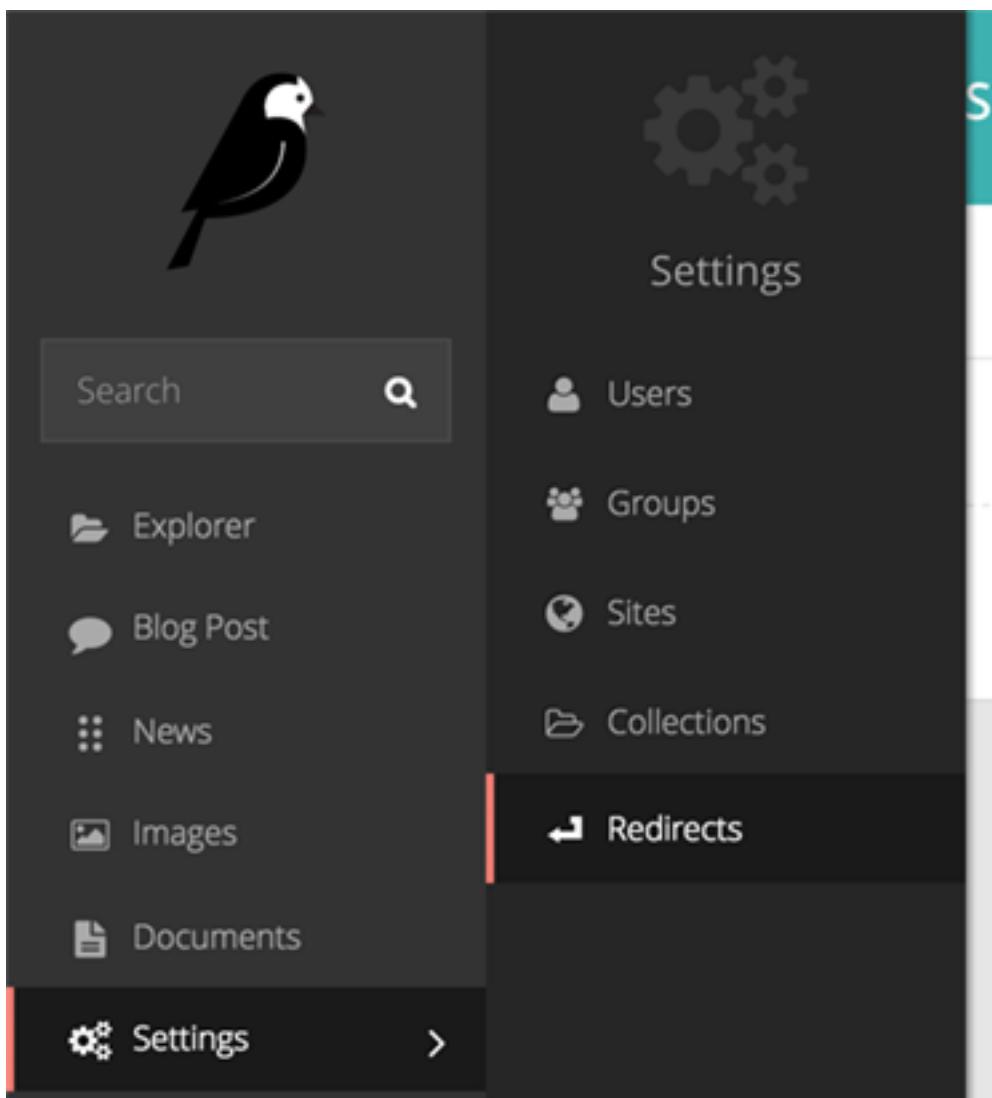
- In the case of a temporary redirect a search engine will keep track of your old page and will index the redirected page as well.
- With a permanent redirect, the search engine will mark the old page as obsolete and considers the new page as a replacement.

---

**Note:** As a best practice Wagtail will check redirects as permanent by default, in order to prevent the undermining of your search engine ranking.

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## Configuring redirects



To configure redirects head over to ‘Redirects’, which can be found in the Settings menu, accessible via the left-hand menu bar.

A screenshot of the 'Redirects' list page. At the top, there's a header with a back arrow, the word 'REDIRECTS', a search bar with the placeholder 'Search redirects', and a blue 'ADD REDIRECT' button. Below the header is a table with two rows of redirect configurations. The first row has 'FROM' as '/new', 'SITE' as 'Your Site [default]', 'TO' as 'News', and 'TYPE' as 'PERMANENT'. The second row has 'FROM' as '/news/a-new-item-which-is-no-longer-available', 'SITE' as 'Your Site [default]', 'TO' as 'http://www.example.com', and 'TYPE' as 'PERMANENT'. At the bottom of the table, it says 'Page 1 of 1.'

- Add a redirect by clicking the *Add redirect* button in the top-right.
- Search for redirects already configured by entering your search term in the search bar. The results will be automatically updated as you type.
- Edit the details of a redirect by clicking the URL path in the listing.

The screenshot shows the Wagtail admin interface for creating a new redirect. At the top, a teal header bar says "EDITING /new". Below it, the "Redirect from:" field contains the URL "/about/news". The "From site:" dropdown is set to "Your Site [default]". A "Permanent:" checkbox is checked. A note below it explains: "Recommended. Permanent redirects ensure search engines forget the old page (the 'Redirect from') and index the new page instead." The "Redirect to a page:" section shows a "News" page selected from a list, with options to "CLEAR CHOICE", "CHOOSE ANOTHER PAGE", or "EDIT THIS PAGE". The "Redirect to any URL:" field is empty. At the bottom are two buttons: a green "SAVE" button and a red "DELETE REDIRECT" button.

- Set *Redirect from* to the URL pattern which is no longer available on your site.
- Set the *From site* if applicable (for eg: a multisite environment).
- Check whether the redirect is *Permanent* or temporary (unchecked).

As a last step you can either redirect to a new page within Wagtail **or** you can redirect the page to a different domain outside of Wagtail.

- Select your page from the explorer for *Redirect to a page*.
- Set a full-domain and path for *Redirect to any URL*.

---

**Note:** Keep in mind a redirect will only be initiated if the page is not found. It will not be applied to existing pages (200) which will resolve on your site.

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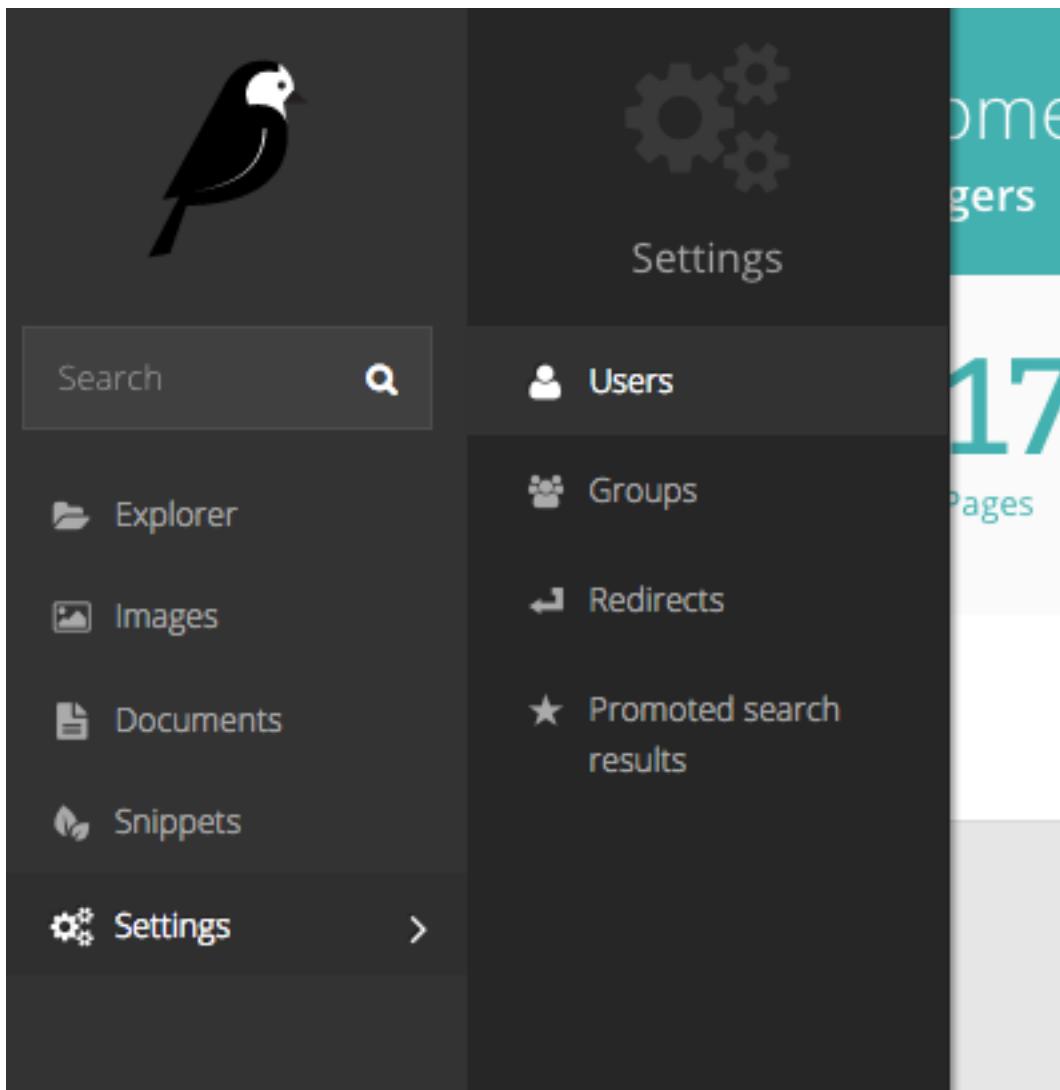
## Administrator tasks

This section of the guide documents how to perform common tasks as an administrator of a Wagtail site.

### Managing users and roles

As an administrator, a common task will be adding, modifying or removing user profiles.

This is done via the ‘Users’ interface, which can be found in the Settings menu, accessible via the left-hand menu bar.



In this interface you can see all of your users, their usernames, their ‘level’ of access (otherwise known as their ‘role’), and their status, either active or inactive.

You can sort this listing either via Name or Username.

The screenshot shows the Wagtail User Management interface. At the top, there's a teal header bar with a user icon, the word 'USERS', a search bar containing 'Search users', and a button labeled '+ ADD A USER'. Below the header is a table with five rows, each representing a user. The columns are 'NAME' (with a dropdown arrow), 'USERNAME', 'LEVEL', and 'STATUS'. Each row contains a small user icon, the user's name, their username, their level (Admin), and a status box labeled 'ACTIVE'.

NAME	USERNAME	LEVEL	STATUS
jamesg	jamesg	Admin	ACTIVE
felicity	felicity	Admin	ACTIVE
Edward Baldry	eddbaldry		ACTIVE
Ged Barker	ged.barker	Admin	ACTIVE
Glenn Barr	glenn.barr	Admin	ACTIVE

Clicking on a user's name will open their profile details. From here you can then edit that user's details.

---

**Note:** It is possible to change user's passwords in this interface, but it is worth encouraging your users to use the 'Forgotten password' link on the login screen instead. This should save you some time!

---

Click the 'Roles' tab to edit the level of access your users have. By default there are three roles:

Role	Create drafts	Publish content	Access Settings
Editor	Yes	No	No
Moderator	Yes	Yes	No
Administrator	Yes	Yes	Yes

### Promoted search results

Wagtail allows you to promote certain search results dependant on the keyword or phrase entered by the user when searching. This can be particularly useful when users commonly refer to parts of your organisation via an acronym that isn't in official use, or if you want to direct users to a page that when they enter a certain term related to the page but not included in the text of the page itself.

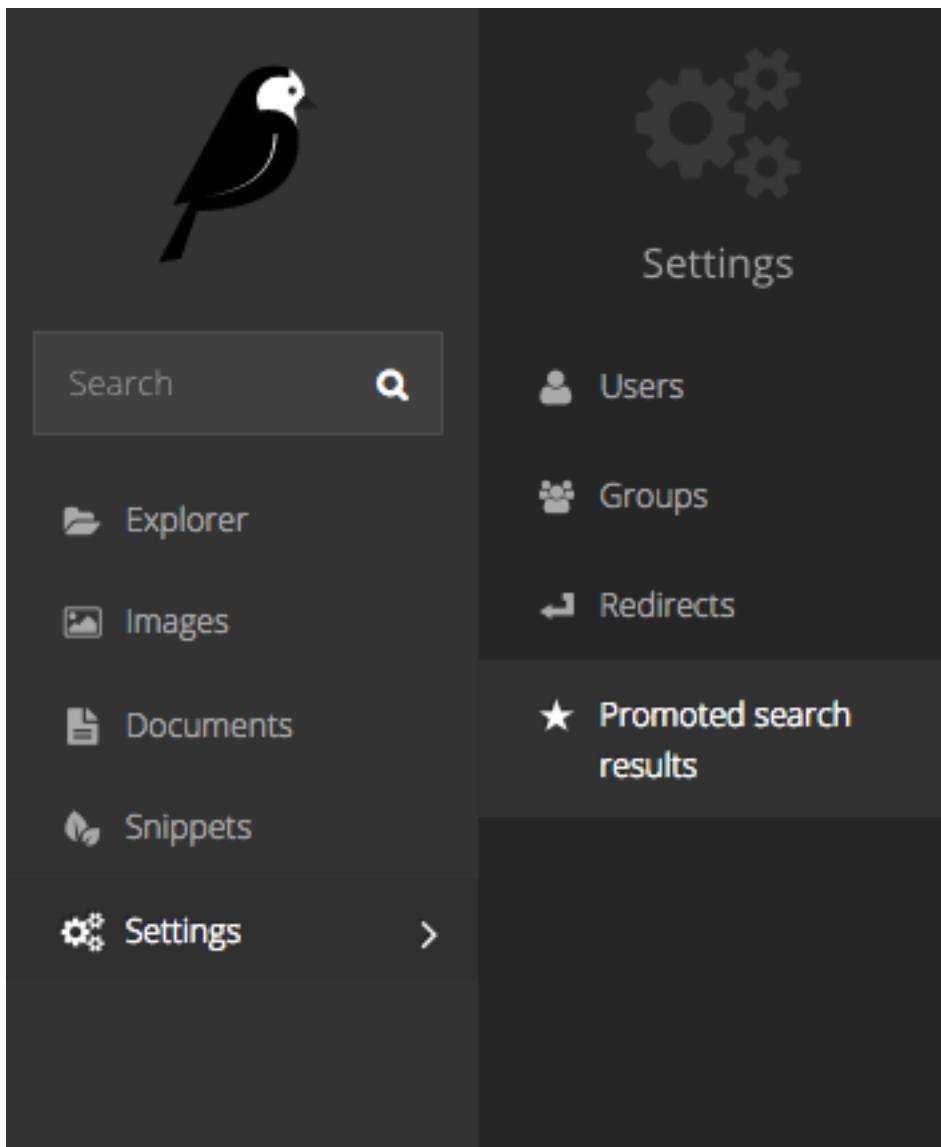
As a concrete example, one of our clients wanted to direct people who searched for 'finances' to their 'Annual budget review' page. The word 'finances' is not mentioned in either the title or the body of the target page. So they created a promoted search result for the word 'finances' that pushed the budget page to the very top of the results.

---

**Note:** The promoted result will only work if the user types *exactly* the phrase that you have set it up for. If you have variations of phrase that you want to take into account, then you must create additional promoted results.

---

To set up the promoted search results, click on the 'Promoted search results' menu item in the 'Settings' menu.

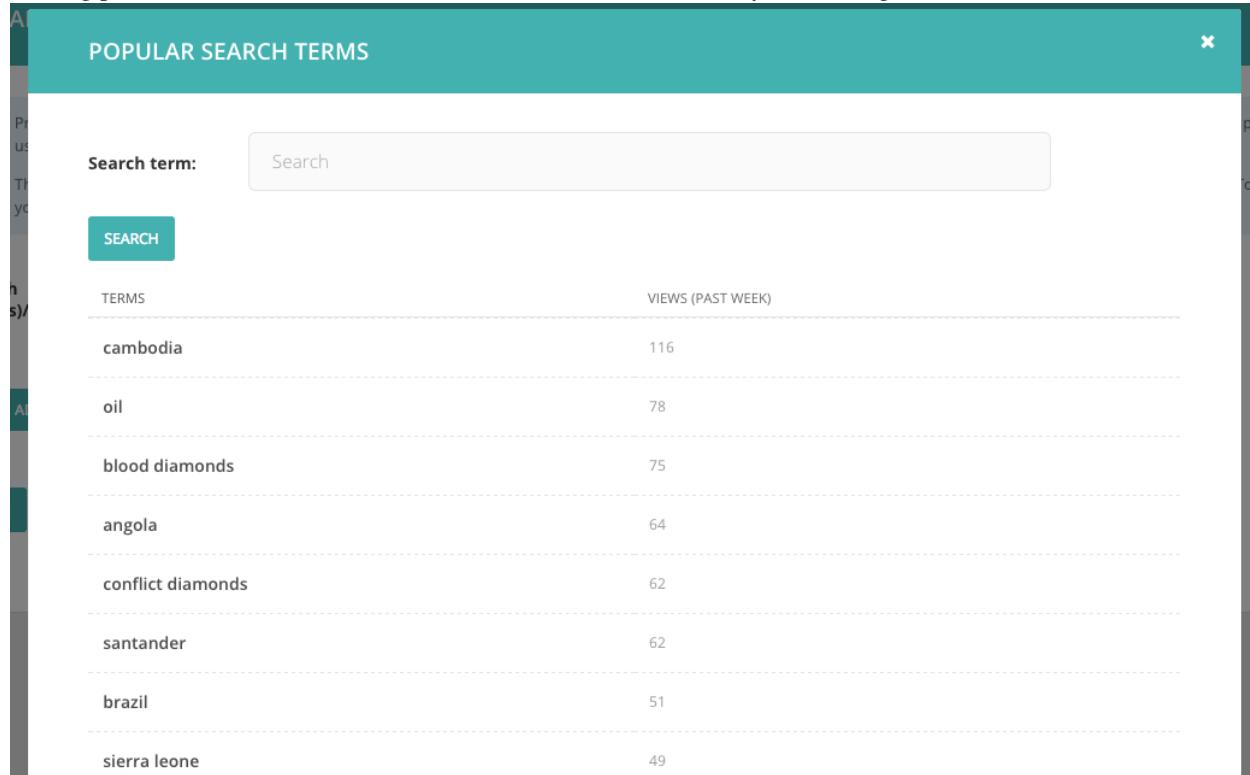


Add a new promoted result from the button in the top right of the resulting screen, or edit an existing promoted result by clicking on it.

The screenshot shows a list of promoted search results. At the top is a teal header bar with a star icon, the text 'PROMOTED SEARCH RESULTS', a search input field containing 'Search editor's picks', and a 'ADD NEW PROMOTED RESULT' button. Below the header is a table with three columns: 'SEARCH TERM(S)', 'PROMOTED RESULTS', and 'VIEWS (PAST WEEK)'. The data rows are:

SEARCH TERM(S)	PROMOTED RESULTS	VIEWS (PAST WEEK)
turkmenistan gas	Turkmenistan, It's A Gas, All That Gas?	0
south sudan oil	Will Star Shine for South Sudan?, Blueprint for Prosperity , Three years in, is South Sudan's oil driving its crisis?	2
south sudan	South Sudan, Will Star Shine for South Sudan? , Blueprint for Prosperity , Fuelling Mistrust	13
cambodia oil	Country For Sale	3
blood red carpet	Surrey Mansion Used To Hide Suspect Funds, Former Kyrgyz president's son lives in £3.5m Surrey mansion despite convictions for attempted murder of UK citizen and grand corruption at home	28

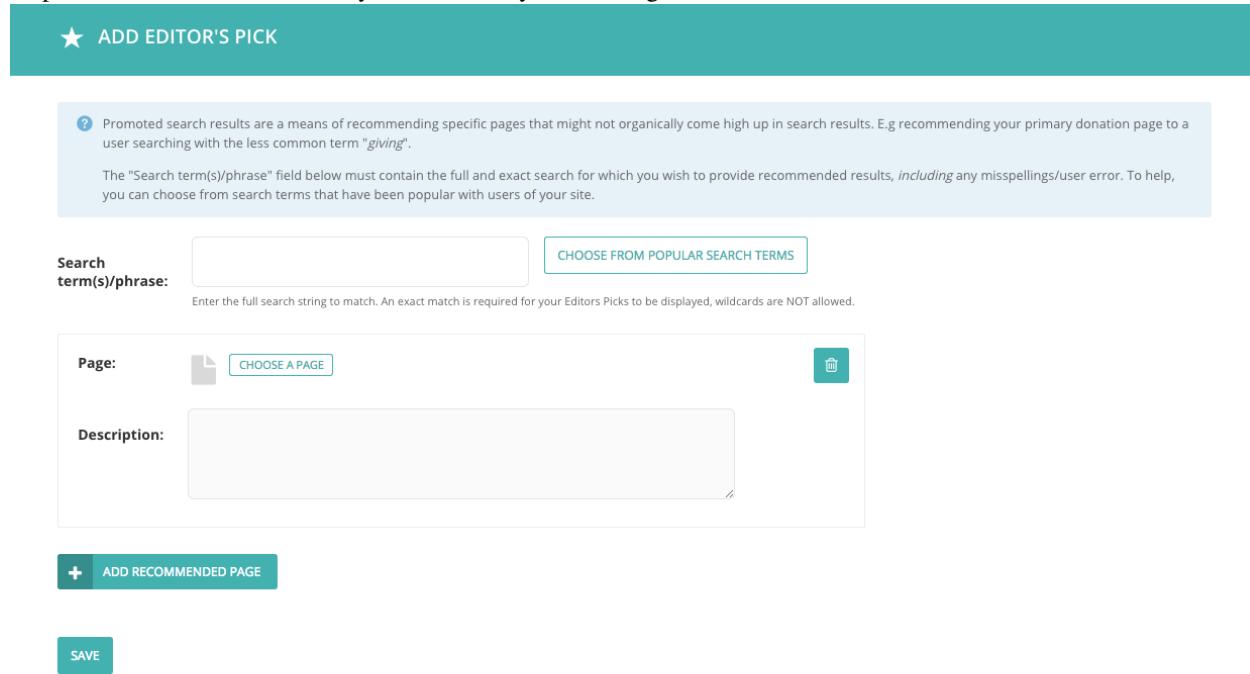
When adding a new promoted result, Wagtail provides you with a ‘Choose from popular search terms’ option. This will show you the most popular terms entered by users into your internal search. You can match this against your existing promoted results to ensure that users are able to find what they are looking for.



The screenshot shows a modal window titled "POPULAR SEARCH TERMS". It includes a search bar with placeholder "Search term:" and a "SEARCH" button. Below the search bar is a table with two columns: "TERMS" and "VIEWS (PAST WEEK)". The data is as follows:

TERMS	VIEWS (PAST WEEK)
cambodia	116
oil	78
blood diamonds	75
angola	64
conflict diamonds	62
santander	62
brazil	51
sierra leone	49

You then add a the result itself by clicking ‘Add recommended page’. You can add multiple results, but be careful about adding too many, as you may end up hiding all of your organic results with promoted results, which may not be helpful for users who aren’t really sure what they are looking for.



The screenshot shows a modal window titled "★ ADD EDITOR'S PICK". It has a "Search term(s)/phrase:" input field, a "CHOOSE FROM POPULAR SEARCH TERMS" button, and a note explaining the purpose of promoted results. Below these are fields for "Page:" (with a "CHOOSE A PAGE" button and a trash icon), "Description:" (with a text area and a trash icon), and a "SAVE" button.

**?** Promoted search results are a means of recommending specific pages that might not organically come high up in search results. E.g recommending your primary donation page to a user searching with the less common term "giving".

The "Search term(s)/phrase" field below must contain the full and exact search for which you wish to provide recommended results, *including* any misspellings/user error. To help, you can choose from search terms that have been popular with users of your site.

Enter the full search string to match. An exact match is required for your Editors Picks to be displayed, wildcards are NOT allowed.

Page:

Description:

## Contributing to Wagtail

### Issues

The easiest way to contribute to Wagtail is to tell us how to improve it! First, check to see if your bug or feature request has already been submitted at [github.com/torchbox/wagtail/issues](https://github.com/torchbox/wagtail/issues). If it has, and you have some supporting information which may help us deal with it, comment on the existing issue. If not, please [create a new one](#), providing as much relevant context as possible. For example, if you're experiencing problems with installation, detail your environment and the steps you've already taken. If something isn't displaying correctly, tell us what browser you're using, and include a screenshot if possible.

### Pull requests

If you're a Python or Django developer, [fork](#) and get stuck in! Send us a useful pull request and we'll post you a [t-shirt](#). We welcome all contributions, whether they solve problems which are specific to you or they address existing issues. If you're stuck for ideas, pick something from the [issue list](#), or email us directly on [hello@wagtail.io](mailto:hello@wagtail.io) if you'd like us to suggest something!

### Translations

Wagtail has internationalisation support so if you are fluent in a non-English language you can contribute by localising the interface.

Translation work should be submitted through [Transifex](#).

### Other contributions

We welcome contributions to all aspects of Wagtail. If you would like to improve the design of the user interface, or extend the documentation, please submit a pull request as above. If you're not familiar with Github or pull requests, [contact us directly](#) and we'll work something out.

### Development

Setting up a local copy of [the Wagtail git repository](#) is slightly more involved than running a release package of Wagtail, as it requires [Node.js](#) and NPM for building Javascript and CSS assets. (This is not required when running a release version, as the compiled assets are included in the release package.)

If you're happy to develop on a virtual machine, the [vagrant-wagtail-develop](#) setup script is the fastest way to get up and running. This will provide you with a running instance of the [Wagtail demo site](#), with the Wagtail and wagtailemo codebases available as shared folders for editing on your host machine.

(Build scripts for other platforms would be very much welcomed - if you create one, please let us know via the [Wagtail Developers group!](#))

If you'd prefer to set up all the components manually, read on. These instructions assume that you're familiar with using pip and virtualenv to manage Python packages.

## Setting up the Wagtail codebase

Install Node.js, v5.3.0 or higher. Instructions for installing Node.js can be found on the [Node.js download page](#). You will also need to install the **libjpeg** and **zlib** libraries, if you haven't done so already - see Pillow's platform-specific [installation instructions](#).

Clone a copy of the Wagtail codebase:

```
git clone https://github.com/torchbox/wagtail.git  
cd wagtail
```

With your preferred virtualenv activated, install the Wagtail package in development mode with the included testing and documentation dependencies:

```
pip install -e .[testing,docs] -U
```

Install the tool chain for building static assets:

```
npm install
```

Compile the assets:

```
npm run build
```

Any Wagtail sites you start up in this virtualenv will now run against this development instance of Wagtail. We recommend using the [Wagtail demo site](#) as a basis for developing Wagtail.

## Testing

From the root of the Wagtail codebase, run the following command to run all the tests:

```
python runtests.py
```

### Running only some of the tests

At the time of writing, Wagtail has well over 1000 tests, which takes a while to run. You can run tests for only one part of Wagtail by passing in the path as an argument to `runtests.py`:

```
python runtests.py wagtail.wagtailcore
```

### Testing against PostgreSQL

By default, Wagtail tests against SQLite. You can switch to using PostgreSQL by using the `--postgres` argument:

```
python runtests.py --postgres
```

If you need to use a different user, password or host. Use the `PGUSER`, `PGPASSWORD` and `PHOST` environment variables.

### Testing against a different database

If you need to test against a different database, set the `DATABASE_ENGINE` environment variable to the name of the Django database backend to test against:

```
DATABASE_ENGINE=django.db.backends.mysql python runtests.py
```

This will create a new database called `test_wagtail` in MySQL and run the tests against it.

### Testing Elasticsearch

You can test Wagtail against Elasticsearch by passing the `--elasticsearch` argument to `runtests.py`:

```
python runtests.py --elasticsearch
```

Wagtail will attempt to connect to a local instance of Elasticsearch (`http://localhost:9200`) and use the index `test_wagtail`.

If your Elasticsearch instance is located somewhere else, you can set the `ELASTICSEARCH_URL` environment variable to point to its location:

```
ELASTICSEARCH_URL=http://my-elasticsearch-instance:9200 python runtests.py --elasticsearch
```

### Compiling static assets

All static assets such as JavaScript, CSS, images, and fonts for the Wagtail admin are compiled from their respective sources by `gulp`. The compiled assets are not committed to the repository, and are compiled before packaging each new release. Compiled assets should not be submitted as part of a pull request.

To compile the assets, run:

```
npm run build
```

This must be done after every change to the source files. To watch the source files for changes and then automatically recompile the assets, run:

```
npm start
```

### Compiling the documentation

The Wagtail documentation is built by Sphinx. To install Sphinx and compile the documentation, run:

```
cd /path/to/wagtail
# Install the documentation dependencies
pip install -e .[docs]
# Compile the docs
cd docs/
make html
```

The compiled documentation will now be in `docs/_build/html`. Open this directory in a web browser to see it. Python comes with a module that makes it very easy to preview static files in a web browser. To start this simple server, run the following commands:

```
$ cd docs/_build/html/
# Python 2
$ python2 -mSimpleHTTPServer 8080
# Python 3
$ python3 -mhttp.server 8080
```

Now you can open <<http://localhost:8080>> in your web browser to see the compiled documentation.

Sphinx caches the built documentation to speed up subsequent compilations. Unfortunately, this cache also hides any warnings thrown by unmodified documentation source files. To clear the built HTML and start fresh, so you can see all warnings thrown when building the documentation, run:

```
$ cd docs/
$ make clean
$ make html
```

## UI Styleguide

Developers working on the Wagtail UI or creating new UI components may wish to test their work against our Styleguide, which is provided as the contrib module “wagtailstyleguide”.

To install the styleguide module on your site, add it to the list of `INSTALLED_APPS` in your settings:

```
INSTALLED_APPS = (
    ...
    'wagtail.contrib.wagtailstyleguide',
    ...
)
```

This will add a ‘Styleguide’ item to the Settings menu in the admin.

At present the styleguide is static: new UI components must be added to it manually, and there are no hooks into it for other modules to use. We hope to support hooks in the future.

The styleguide doesn’t currently provide examples of all the core interface components; notably the Page, Document, Image and Snippet chooser interfaces are not currently represented.

## Python coding guidelines

### PEP8

We ask that all Python contributions adhere to the [PEP8](#) style guide, apart from the restriction on line length (E501). In addition, import lines should be sorted according to [isort](#) rules. If you have installed Wagtail’s testing dependencies (`pip install -e .[testing]`), you can check your code by running `make lint`.

### Python 2 and 3 compatibility

All contributions should support Python 2 and 3 and we recommend using the [six](#) compatibility library (use the pip version installed as a dependency, not the version bundled with Django).

### Django compatibility

Wagtail is written to be compatible with multiple versions of Django. Sometimes, this requires running one piece of code for recent version of Django, and another piece of code for older versions of Django. In these cases, always check which version of Django is being used by inspecting `django.VERSION`:

```
import django

if django.VERSION >= (1, 9):
    # Use new attribute
    related_field = field.rel
else:
    # Use old, deprecated attribute
    related_field = field.related
```

Always compare against the version using greater-or-equals (`>=`), so that code for newer versions of Django is first.

Do not use a `try ... except` when seeing if an object has an attribute or method introduced in a newer versions of Django, as it does not clearly express why the `try ... except` is used. An explicit check against the Django version makes the intention of the code very clear.

```
# Do not do this
try:
    related_field = field.rel
except AttributeError:
    related_field = field.related
```

If the code needs to use something that changed in a version of Django many times, consider making a function that encapsulates the check:

```
import django

def related_field(field):
    if django.VERSION >= (1, 9):
        return field.rel
    else:
        return field.related
```

If a new function has been introduced by Django that you think would be very useful for Wagtail, but is not available in older versions of Django that Wagtail supports, that function can be copied over in to Wagtail. If the user is running a new version of Django that has the function, the function should be imported from Django. Otherwise, the version bundled with Wagtail should be used. A link to the Django source code where this function was taken from should be included:

```
import django

if django.VERSION >= (1, 9):
    from django.core.validators import validate_unicode_slug
else:
    # Taken from https://github.com/django/django/blob/1.9/django/core/validators.py#L230
    def validate_unicode_slug(value):
        # Code left as an exercise to the reader
        pass
```

## Tests

Wagtail has a suite of tests, which we are committed to improving and expanding. See [Testing](#).

We run continuous integration at [travis-ci.org/torchbox/wagtail](https://travis-ci.org/torchbox/wagtail) to ensure that no commits or pull requests introduce test failures. If your contributions add functionality to Wagtail, please include the additional tests to cover it; if your contributions alter existing functionality, please update the relevant tests accordingly.

## CSS coding guidelines

Our CSS is written in Sass, using the SCSS syntax.

### Compiling

The SCSS source files are compiled to CSS using the `gulp` build system. This requires `node.js` to run. To install the libraries required for compiling the SCSS, run the following from the Wagtail repository root:

```
$ npm install
```

To compile the assets, run:

```
$ npm run build
```

Alternatively, the SCSS files can be monitored, automatically recompiling when any changes are observed, by running:

```
$ npm start
```

## Linting SCSS

Wagtail uses the “scss-lint” Ruby Gem for linting.

Install it thus:

```
$ gem install scss-lint
```

Then run the linter from the wagtail project root:

```
$ scss-lint
```

The linter is configured to check your code for adherence to the guidelines below, plus a little more.

## Spacing

- Use soft-tabs with a four space indent. Spaces are the only way to guarantee code renders the same in any person’s environment.
- Put spaces after : in property declarations.
- Put spaces before { in rule declarations.
- Put line breaks between rulesets.
- When grouping selectors, put each selector on its own line.
- Place closing braces of declaration blocks on a new line.
- Each declaration should appear on its own line for more accurate error reporting.
- Add a newline at the end of your .scss files.
- Strip trailing whitespace from your rules.
- Add a space after the comma, in comma-delimited property values e.g `rgba()`

## Formatting

- Use hex color codes #000 unless using `rgba()` in raw CSS (SCSS’ `rgba()` function is overloaded to accept hex colors as a param, e.g., `rgba(#000, .5)`).
- Use // for comment blocks (instead of /\* \*/).
- Use single quotes for string values `background: url('my/image.png')` or `content: 'moose'`
- Avoid specifying units for zero values, e.g., `margin: 0;` instead of `margin: 0px;`.
- Strive to limit use of shorthand declarations to instances where you must explicitly set all the available values.

**Sass imports** Leave off underscores and file extensions in includes:

```
// Bad
@import 'components/_widget.scss'

// Better
@import 'components/widget'
```

**Pixels vs. ems** Use `rems` for `font-size`, because they offer absolute control over text. Additionally, unit-less `line-height` is preferred because it does not inherit a percentage value of its parent element, but instead is based on a multiplier of the `font-size`.

**Specificity (classes vs. ids)** Always use classes instead of IDs in CSS code. IDs are overly specific and lead to duplication of CSS.

When styling a component, start with an element + class namespace, prefer direct descendant selectors by default, and use as little specificity as possible. Here is a good example:

```
<ul class="category-list">
    <li class="item">Category 1</li>
    <li class="item">Category 2</li>
    <li class="item">Category 3</li>
</ul>

.category-list { // element + class namespace

    // Direct descendant selector > for list items
    > li {
        list-style-type: disc;
    }

    // Minimal specificity for all links
    a {
        color: #f00;
    }
}
```

**Class naming conventions** Never reference `js-` prefixed class names from CSS files. `js-` are used exclusively from JS files.

Use the SMACSS `is-` prefix for state rules that are shared between CSS and JS.

**Misc** As a rule of thumb, avoid unnecessary nesting in SCSS. At most, aim for three levels. If you cannot help it, step back and rethink your overall strategy (either the specificity needed, or the layout of the nesting).

**Examples** Here are some good examples that apply the above guidelines:

```
// Example of good basic formatting practices
.styleguide-format {
    color: #000;
    background-color: rgba(0, 0, 0, .5);
    border: 1px solid #0f0;
}

// Example of individual selectors getting their own lines (for error reporting)
.multiple,
```

```
.classes,
.get-new-lines {
    display: block;
}

// Avoid unnecessary shorthand declarations
.not-so-good {
    margin: 0 0 20px;
}
.good {
    margin-bottom: 20px;
}
```

## JavaScript coding guidelines

Write JavaScript according to the [Airbnb Styleguide](#), with some exceptions:

- Use soft-tabs with a four space indent. Spaces are the only way to guarantee code renders the same in any person's environment.
- We accept `snake_case` in object properties, such as `ajaxResponse.page_title`, however `camelCase` or `UPPER_CASE` should be used everywhere else.

## Linting and formatting code

Wagtail provides some tooling configuration to help check your code meets the styleguide. You'll need `node.js` and `npm` on your development machine. Ensure project dependencies are installed by running `npm install`

### Linting code

```
npm run lint:js
```

This will lint all the JS in the wagtail project, excluding vendor files and compiled libraries.

Some of the modals are generated via server-side scripts. These include template tags that upset the linter, so modal workflow JavaScript is excluded from the linter.

### Formatting code

```
npm run format:js
```

This will perform safe edits to conform your JS code to the styleguide. It won't touch the line-length, or convert quotemarks from double to single.

Run the linter after you've formatted the code to see what manual fixes you need to make to the codebase.

### Changing the linter configuration

Under the hood, the tasks use the [JavaScript Code Style](#) library.

To edit the settings for ignored files, or to change the linting rules, edit the `.jscsrc` file in the wagtail project root.

A complete list of the possible linting rules can be found here: [JSCS Rules](#)

## Issue tracking

We welcome bug reports, feature requests and pull requests through Wagtail's [Github](#) issue tracker.

### Issues

An issue must always correspond to a specific action with a well-defined completion state: fixing a bug, adding a new feature, updating documentation, cleaning up code. Open-ended issues where the end result is not immediately clear (“come up with a way of doing translations”) are fine, as long as there’s a clear way to progress the issue and identify when it has been completed (not e.g. “make rich text fields suck less”).

Do not use issues for support queries or other questions (“How do I do X?” - although “Implement a way of doing X” or “Document how to do X” could well be valid issues). These should go on the [Wagtail Support Google group](#).

As soon as a ticket is opened - ideally within one day - a member of the core team will give it an initial classification, by either closing it as invalid or assigning it to a milestone. Don’t be discouraged if you feel that your ticket has been given a lower priority than it deserves - this decision isn’t permanent. We will consider all feedback, and reassign or reopen tickets where appropriate.

(From the other side, this means that the core team member doing the classification should feel free to make bold unilateral decisions - there’s no need to seek consensus first. If they make the wrong judgment call, that can always be reversed later.)

The possible milestones that it might be assigned to are as follows:

- **invalid** (closed): this issue doesn’t identify a specific action to be taken, or the action is not one that we want to take. For example - a bug report for something that’s working as designed, or a feature request for something that’s actively harmful.
- **some-day**: the issue is accepted as valid (i.e. it’s a bug report for a legitimate bug, or a useful feature request) but not deemed a priority to work on (in the opinion of the core team). For example - a bug that’s only cosmetic, or a feature that would be kind of neat but not really essential. Feel free to take it on!
- **real-soon-now**: the issue is considered important by the core team (roughly speaking: it’s a bug or missing feature that’s causing headaches for people) but isn’t necessarily going to be completed on any set timescale. Feel free to take it on!
- A specific version number: the issue is important enough that it needs to be fixed in this version.

On some occasions it may take longer for the core team to classify an issue into a milestone. For example:

- It may require a non-trivial amount of work to confirm the presence of a bug. In this case, feedback and further details from other contributors, whether or not they can replicate the bug, would be particularly welcomed.
- It may require further discussion to decide whether the proposal is a good idea or not - if so, it will be tagged “design decision needed”.

We will endeavour to make sure that issues don’t remain in this state for prolonged periods. Issues and PRs tagged “design decision needed” will be revisited regularly and discussed with at least two core contributors - we aim to review each ticket at least once per release cycle (= 6 weeks).

### Pull requests

As with issues, the core team will classify pull requests as soon as they are opened, usually within one day. Unless the change is invalid or particularly contentious (in which case it will be closed or marked as “design decision needed”), it will generally be classified under the next applicable version - the next minor release for new features, or the next patch release for bugfixes - and marked as ‘Needs review’. All contributors, core and non-core, are invited to offer feedback on the pull request.

Subsequently (ideally within a week or two, but possibly longer for larger submissions) a core team member will merge it if it is ready to be merged, or tag it as requiring further work ('needs work' / 'needs tests' / 'needs docs'). In the latter case, they may also reassign it to a later milestone ('real-soon-now' or 'some-day'). Pull requests that

require further work are handled and prioritised in the same way as issues - anyone is welcome to pick one up from the backlog, whether or not they were the original committer.

### Release schedule

We aim to release a new version every 2 months. To keep to this schedule, we will tend to ‘bump’ issues and PRs to a future release where necessary, rather than let them delay the present one. For this reason, an issue being tagged under a particular release milestone should not be taken as any kind of guarantee that the feature will actually be shipped in that release.

### Committing code

This section is for the committers of Wagtail, or for anyone interested in the process of getting code committed to Wagtail.

Code should only be committed after it has been reviewed by at least one other reviewer or committer, unless the change is a small documentation change or fixing a typo.

Most code contributions will be in the form of pull requests from Github. Pull requests should not be merged from Github though. Instead, the code should be checked out by a committer locally, the changes examined and rebased, the `CHANGELOG.txt` and release notes updated, and finally the code should be pushed to the master branch. This process is covered in more detail below.

#### Check out the code locally

If the code has been submitted as a pull request, you should fetch the changes and check them out in your Wagtail repository. A simple way to do this is by adding the following `git` alias to your `~/.gitconfig` (assuming `upstream` is `torchbox/wagtail`):

```
[alias]
pr = !sh -c "git fetch upstream pull/${1}/head:pr/${1} && git checkout pr/${1}\\"
```

Now you can check out pull request number `xxxx` by running `git pr xxxx`.

#### Rebase on to master

Now that you have the code, you should rebase the commits on to the master branch. Rebasing is preferred over merging, as merge commits make the commit history harder to read for small changes.

You can fix up any small mistakes in the commits, such as typos and formatting, as part of the rebase. `git rebase --interactive` is an excellent tool for this job.

```
# Get the latest commits from Wagtail
$ git fetch upstream
$ git checkout master
$ git merge --ff-only upstream/master
# Rebase this pull request on to master
$ git checkout pr/yyyy
$ git rebase master
# Update master to this commit
$ git checkout master
$ git merge --ff-only pr/yyyy
```

### Update CHANGELOG.txt and release notes

Every significant change to Wagtail should get an entry in the `CHANGELOG.txt`, and the release notes for the current version.

The `CHANGELOG.txt` contains a short summary of each new feature, refactoring, or bug fix in each release. Each summary should be a single line. Bug fixes should be grouped together at the end of the list for each release, and be prefixed with “Fix:”. The name of the contributor should be added at the end of the summary, in brackets, if they are not a core committer. For example:

```
* Fix: Tags added on the multiple image uploader are now saved correctly (Alex Smith)
```

The release notes for each version contain a more detailed description of each change. Backwards compatibility notes should also be included. Large new features or changes should get their own section, while smaller changes and bug fixes should be grouped together in their own section. See previous release notes for examples. The release notes for each version are found in `docs/releases/x.x.x.rst`.

If the contributor is a new person, and this is their first contribution to Wagtail, they should be added to the `CONTRIBUTORS.rst` list. Contributors are added in chronological order, with new contributors added to the bottom of the list. Use their preferred name. You can usually find the name of a contributor on their Github profile. If in doubt, or if their name is not on their profile, ask them how they want to be named.

If the changes to be merged are small enough to be a single commit, amend this single commit with the additions to the `CHANGELOG.txt`, release notes, and contributors:

```
$ git add CHANGELOG.txt docs/releases/x.x.x.rst CONTRIBUTORS.rst
$ git commit --amend --no-edit
```

If the changes do not fit in a single commit, make a new commit with the updates to the `CHANGELOG.txt`, release notes, and contributors. The commit message should say `Release notes for #xxxx`:

```
$ git add CHANGELOG.txt docs/releases/x.x.x.rst CONTRIBUTORS.rst
$ git commit -m 'Release notes for #xxxx'
```

### Push to master

The changes are ready to be pushed to master now.

```
# Check that everything looks OK
$ git log upstream/master..master --oneline
$ git push --dry-run upstream master
# Push the commits!
$ git push upstream master
$ git branch -d pr/xxxx
```

## Wagtail's release process

### Official releases

Release numbering works as follows:

- Versions are numbered in the form A.B or A.B.C.
- A.B is the *feature release* version number. Each version will be mostly backwards compatible with the previous release. Exceptions to this rule will be listed in the release notes.

- C is the *patch release* version number, which is incremented for bugfix and security releases. These releases will be 100% backwards-compatible with the previous patch release. The only exception is when a security or data loss issue can't be fixed without breaking backwards-compatibility. If this happens, the release notes will provide detailed upgrade instructions.
- Before a new feature release, we'll make at least one release candidate release. These are of the form A.BrcN, which means the N<sup>th</sup> release candidate of version A.B.

In git, each Wagtail release will have a tag indicating its version number. Additionally, each release series has its own branch, called `stable/A.B.x`, and bugfix/security releases will be issued from those branches.

**Feature release** Feature releases (A.B, A.B+1, etc.) will happen roughly every two months – see [release process](#) for details. These releases will contain new features, improvements to existing features, and such.

**Patch release** Patch releases (A.B.C, A.B.C+1, etc.) will be issued as needed, to fix bugs and/or security issues.

These releases will be 100% compatible with the associated feature release, unless this is impossible for security reasons or to prevent data loss. So the answer to “should I upgrade to the latest patch release?” will always be “yes.”

**Long-term support release** Certain feature releases will be designated as long-term support (LTS) releases. These releases will get security and data loss fixes applied for a guaranteed period of time, typically six months.

## Release cadence

Wagtail uses a loose form of [semantic versioning](#). SemVer makes it easier to see at a glance how compatible releases are with each other. It also helps to anticipate when compatibility shims will be removed. It's not a pure form of SemVer as each feature release will continue to have a few documented backwards incompatibilities where a deprecation path isn't possible or not worth the cost.

## Deprecation policy

A feature release may deprecate certain features from previous releases. If a feature is deprecated in feature release A.B, it will continue to work in the following version but raise warnings. Features deprecated in release A.B will be removed in the A.B+2 release to ensure deprecations are done over at least 2 feature releases.

So, for example, if we decided to start the deprecation of a function in Wagtail 1.4:

- Wagtail 1.4 will contain a backwards-compatible replica of the function which will raise a `RemovedInWagtail16Warning`.
- Wagtail 1.5 will still contain the backwards-compatible replica.
- Wagtail 1.6 will remove the feature outright.

The warnings are silent by default. You can turn on display of these warnings with the `python -Wd` option.

## Supported versions

At any moment in time, Wagtail's developer team will support a set of releases to varying levels.

- The current development master will get new features and bug fixes requiring non-trivial refactoring.
- Patches applied to the master branch must also be applied to the last feature release branch, to be released in the next patch release of that feature series, when they fix critical problems:
  - Security issues.
  - Data loss bugs.

- Crashing bugs.
- Major functionality bugs in newly-introduced features.
- Regressions from older versions of Wagtail.

The rule of thumb is that fixes will be backported to the last feature release for bugs that would have prevented a release in the first place (release blockers).

- Security fixes and data loss bugs will be applied to the current master, the last feature release branch, and any other supported long-term support release branches.
- Documentation fixes generally will be more freely backported to the last release branch. That's because it's highly advantageous to have the docs for the last release be up-to-date and correct, and the risk of introducing regressions is much less of a concern.

As a concrete example, consider a moment in time halfway between the release of Wagtail 1.6 and 1.7. At this point in time:

- Features will be added to `master`, to be released as Wagtail 1.7.
- Critical bug fixes will be applied to the `stable/1.6.x` branch, and released as 1.6.1, 1.6.2, etc.
- Security fixes and bug fixes for data loss issues will be applied to `master` and to the `stable/1.6.x` and `stable/1.4.x` (LTS) branches. They will trigger the release of 1.6.1, 1.4.8, etc.
- Documentation fixes will be applied to `master`, and, if easily backported, to the latest stable branch, 1.6.x.

### Supported versions of Django

Each release of Wagtail declares which versions of Django it supports.

Typically, a new Wagtail feature release supports the last long-term support version and all following versions of Django.

For example, consider a moment in time before release of Wagtail 1.5 and after the following releases:

- Django 1.8 (LTS)
- Django 1.9
- Wagtail 1.4 (LTS) - Released before Django 1.10 and supports Django 1.8 and 1.9
- Django 1.10

Wagtail 1.5 will support Django 1.8 (LTS), 1.9, 1.10. Wagtail 1.4 will still support only Django 1.8 (LTS) and 1.9.

### Release process

Wagtail uses a time-based release schedule, with feature releases every two months or so.

After each feature release, the release manager will announce a timeline for the next feature release.

**Release cycle** Each release cycle consists of three parts:

**Phase one: feature proposal** The first phase of the release process will include figuring out what major features to include in the next version. This should include a good deal of preliminary work on those features – working code trumps grand design.

**Phase two: development** The second part of the release schedule is the “heads-down” working period. Using the roadmap produced at the end of phase one, we’ll all work very hard to get everything on it done.

At the end of phase two, any unfinished features will be postponed until the next release.

At this point, the `stable/A.B.x` branch will be forked from `master`.

**Phase three: bugfixes** The last part of a release cycle is spent fixing bugs – no new features will be accepted during this time.

Once all known blocking bugs have been addressed, a release candidate will be made available for testing. The final release will usually follow two weeks later, although this period may be extended if further release blockers are found.

During this phase, committers will be more and more conservative with backports, to avoid introducing regressions. After the release candidate, only release blockers and documentation fixes should be backported.

Developers should avoid adding any new translatable strings after the release candidate - this ensures that translators have the full period between the release candidate and the final release to bring translations up to date. Translations will be re-imported immediately before the final release.

In parallel to this phase, `master` can receive new features, to be released in the `A.B+1` cycle.

**Bug-fix releases** After a feature release (e.g. `A.B`), the previous release will go into bugfix mode.

The branch for the previous feature release (e.g. `stable/A.B-1.x`) will include bugfixes. Critical bugs fixed on `master` must *also* be fixed on the bugfix branch; this means that commits need to cleanly separate bug fixes from feature additions. The developer who commits a fix to `master` will be responsible for also applying the fix to the current bugfix branch.

## Release notes

### Wagtail 1.7 release notes

- *What's new*
- *Upgrade considerations*

#### What's new

##### Elasticsearch 2 support

Wagtail now supports Elasticsearch 2. Note that you need to change backend in `WAGTAILSEARCH_BACKENDS`, if you wish to switch to Elasticsearch 2. This feature was developed by Karl Hobley.

See: [Elasticsearch Backend](#)

##### New image tag options for file type and JPEG compression level

The `{% image %}` tag now supports extra parameters for specifying the image file type and JPEG compression level on a per-tag basis. See [Output image format](#) and [JPEG image quality](#). This feature was developed by Karl Hobley.

### AWS CloudFront support added to cache invalidation module

Wagtail's cache invalidation module can now invalidate pages cached in AWS CloudFront when they are updated or unpublished. This feature was developed by Rob Moorman.

See: [Amazon CloudFront](#)

### Unpublishing subpages

Unpublishing a page now gives the option to unpublish its subpages at the same time. This feature was developed by Jordi Joan.

### Minor features

- The `| embed` filter has been converted into a templatetag `{% embed %}` (Janneke Janssen)
- The `wagtailforms` module now provides a `FormSubmissionPanel` for displaying details of form submissions; see [Displaying form submission information](#) for documentation. (João Luiz Lorenzetti)
- The Wagtail version number can now be obtained as a tuple using `from wagtail import VERSION` (Tim Heap)
- `send_mail` logic has been moved from `AbstractEmailForm.process_form_submission` into `AbstractEmailForm.send_mail`. Now it's easier to override this logic (Tim Leguijt)
- Added `before_create_page`, `before_edit_page`, `before_delete_page` hooks (Karl Hobley)
- Updated font sizes and colours to improve legibility of admin menu and buttons (Stein Strindhaug)
- Added pagination to “choose destination” view when moving pages (Nick Smith, Žan Anderle)
- Added ability to annotate search results with score - see [Annotating results with score](#) (Karl Hobley)
- Added ability to limit access to form submissions - see [filter\\_form\\_submissions\\_for\\_user](#) (Mikalai Radchuk)
- Added the ability to configure the number of days search logs are kept for, through the `WAGTAILSEARCH_HITS_MAX_AGE` setting (Stephen Rice)
- SnippetChooserBlock now supports passing the model name as a string (Nick Smith)
- Redesigned account settings / logout area in the sidebar for better clarity (Janneke Janssen)
- Pillow's image optimisation is now applied when saving JPEG images (Karl Hobley)

### Bug fixes

- Migrations for `wagtailcore` and project template are now reversible (Benjamin Bach)
- Migrations no longer depend on `wagtailcore` and `taggit`'s `__latest__` migration, logically preventing those apps from receiving new migrations (Matt Westcott)
- The default image format label text ('Full width', 'Left-aligned', 'Right-aligned') is now localised (Mikalai Radchuk)
- Text on the front-end ‘password required’ form is now marked for translation (Janneke Janssen)
- Text on the page view restriction form is now marked for translation (Luiz Boaretto)
- Fixed toggle behaviour of userbar on mobile (Robert Rollins)

- Image rendition / document file deletion now happens on a post\_delete signal, so that files are not lost if the deletion does not proceed (Janneke Janssen)
- “Your recent edits” list on dashboard no longer leaves out pages that another user has subsequently edited (Michael Cordover, Kees Hink, João Luiz Lorencetti)
- InlinePanel now accepts a classname parameter as per the documentation (emg36, Matt Westcott)
- Disabled use of escape key to revert content of rich text fields, which could cause accidental data loss (Matt Westcott)
- Setting USE\_THOUSAND\_SEPARATOR = True no longer breaks the rendering of numbers in JS code for InlinePanel (Mattias Loverot, Matt Westcott)
- Images / documents pagination now preserves GET parameters (Bojan Mihelac)
- Wagtail’s UserProfile model now sets a related\_name of wagtail\_userprofile to avoid naming collisions with other user profile models (Matt Westcott)
- Non-text content is now preserved when adding or editing a link within rich text (Matt Westcott)
- Fixed preview when SECURE\_SSL\_REDIRECT = True (Aymeric Augustin)
- Prevent hang when truncating an image filename without an extension (Ricky Robinett)

## Upgrade considerations

### Project template's initial migration should not depend on wagtailcore.\_\_latest\_\_

On projects created under previous releases of Wagtail, the home/migrations/0001\_initial.py migration created by the wagtail start command contains the following dependency line:

```
dependencies = [
    ('wagtailcore', '__latest__'),
]
```

This may produce InconsistentMigrationHistory errors under Django 1.10 when upgrading Wagtail, since Django interprets this to mean that no new migrations can legally be added to wagtailcore after this migration is applied. This line should be changed to:

```
dependencies = [
    ('wagtailcore', '0029_unicode_slugfield_dj19'),
]
```

### Custom image models require a data migration for the new filter\_spec field

The data model for image renditions will be changed in Wagtail 1.8 to eliminate Filter as a model. Wagtail sites using a custom image model (see [Custom image models](#)) need to have a schema and data migration in place prior to upgrading to Wagtail 1.8. To create these migrations:

- Run manage.py makemigrations to create the schema migration
- Run manage.py makemigrations --empty myapp (replacing myapp with the name of the app containing the custom image model) to create an empty migration
- Edit the created migration to contain:

```
from wagtail.wagtailimages.utils import get_fill_filter_spec_migrations
```

and, for the operations list:

```
forward, reverse = get_fill_filter_spec_migrations('myapp', 'CustomRendition')
operations = [
    migrations.RunPython(forward, reverse),
]
```

replacing `myapp` and `CustomRendition` with the app and model name for the custom rendition model.

### embed template filter is now a template tag

The `embed` template filter, used to translate the URL of a media resource (such as a YouTube video) into a corresponding embeddable HTML fragment, has now been converted to a template tag. Any template code such as:

```
{% load wagtailembeds_tags %}
...
{{ my_media_url|embed }}
```

should now be rewritten as:

```
{% load wagtailembeds_tags %}
...
{% embed my_media_url %}
```

## Wagtail 1.6.3 release notes

- *What's changed*

### What's changed

#### Bug fixes

- Restore compatibility with django-debug-toolbar 1.5 (Matt Westcott)
- Edits to StreamFields are no longer ignored in page edits on Django >=1.10.1 when a default value exists (Matt Westcott)

## Wagtail 1.6.2 release notes

- *What's changed*

### What's changed

#### Bug fixes

- Initial values of checkboxes on group permission edit form now are visible on Django 1.10 (Matt Westcott)

## Wagtail 1.6.1 release notes

- *What's new*
- *Upgrade considerations*

### What's new

#### Minor features

- Added `WAGTAIL_ALLOW_UNICODE_SLUGS` setting to make Unicode support optional in page slugs (Matt Westcott)

#### Bug fixes

- Wagtail's middleware classes are now compatible with Django 1.10's new-style middleware (Karl Hobley)
- The `can_create_at()` method is now checked in the create page view (Mikalai Radchuk)
- Fixed regression on Django 1.10.1 causing Page subclasses to fail to use PageManager (Matt Westcott)
- ChoiceBlocks with lazy translations as option labels no longer break Elasticsearch indexing (Matt Westcott)
- The page editor no longer fails to load JavaScript files with `ManifestStaticFilesStorage` (Matt Westcott)
- Django 1.10 enables client-side validation for all forms by default, but it fails to handle all the nuances of how forms are used in Wagtail. The client-side validation has been disabled for the Wagtail UI (Matt Westcott)

### Upgrade considerations

#### Multi-level inheritance and custom managers

The inheritance rules for *Custom Page managers* have been updated to match Django's standard behaviour. In the vast majority of scenarios there will be no change. However, in the specific case where a page model with a custom `objects` manager is subclassed further, the subclass will be assigned a plain `Manager` instead of a `PageManager`, and will now need to explicitly override this with a `PageManager` to function correctly:

```
class EventPage(Page):  
    objects = EventManager()  
  
class SpecialEventPage(EventPage):  
    # Previously SpecialEventPage.objects would be set to a PageManager automatically;  
    # this now needs to be set explicitly  
    objects = PageManager()
```

## Wagtail 1.6 release notes

- [What's new](#)
- [Upgrade considerations](#)

### What's new

#### Django 1.10 support

Wagtail is now compatible with Django 1.10. Thanks to Mikalai Radchuk and Paul J Stevens for developing this, and to Tim Graham for reviewing and additional Django core assistance.

#### `{% include_block %}` tag for improved StreamField template inclusion

In previous releases, the standard way of rendering the HTML content of a StreamField was through a simple variable template tag, such as `{{ page.body }}`. This had the drawback that any templates used in the StreamField rendering would not inherit variables from the parent template's context, such as `page` and `request`. To address this, a new template tag `{% include_block page.body %}` has been introduced as the new recommended way of outputting Streamfield content - this replicates the behaviour of Django's `{% include %}` tag, passing on the full template context by default. For full documentation, see [Template rendering](#). This feature was developed by Matt Westcott, and additionally ported to Jinja2 (see: [Jinja2 template support](#)) by Mikalai Radchuk.

#### Unicode page slugs

Page URL slugs can now contain Unicode characters, when using Django 1.9 or above. This feature was developed by Behzad Nategah.

#### Permission-limited explorer menu

The explorer sidebar menu now limits the displayed pages to the ones the logged-in user has permission for. For example, if a user has permission over the pages MegaCorp / Departments / Finance and MegaCorp / Departments / HR, then their menu will begin at “Departments”. This reduces the amount of “drilling-down” the user has to do, and is an initial step towards supporting fully independent sites on the same Wagtail installation. This feature was developed by Matt Westcott and Robert Rollins, California Institute of Technology.

#### Minor features

- Image upload form in image chooser now performs client side validation so that the selected file is not lost in the submission (Jack Paine)
- oEmbed URL for audioBoom was updated (Janneke Janssen)
- Remember tree location in page chooser when switching between Internal / External / Email link (Matt Westcott)
- `FieldRowPanel` now creates equal-width columns automatically if `col*` classnames are not specified (Chris Rogers)
- Form builder now validates against multiple fields with the same name (Richard McMillan)
- The ‘choices’ field on the form builder no longer has a maximum length (Johannes Spielmann)

- Multiple ChooserBlocks inside a StreamField are now prefetched in bulk, for improved performance (Michael van Tellingen, Roel Bruggink, Matt Westcott)
- Added new EmailBlock and IntegerBlock (Oktay Altay)
- Added a new FloatBlock, DecimalBlock and a RegexBlock (Oktay Altay, Andy Babic)
- Wagtail version number is now shown on the settings menu (Chris Rogers)
- Added a system check to validate that fields listed in `search_fields` are defined on the model (Josh Schneier)
- Added formal APIs for customising the display of StructBlock forms within the page editor - see [\*Custom editing interfaces for StructBlock\*](#) (Matt Westcott)
- `wagtailforms.models.AbstractEmailForm` now supports multiple email recipients (Serafeim Pastefanos)
- Added ability to delete users through Settings -> Users (Vincent Audebert; thanks also to Ludolf Takens and Tobias Schmidt for alternative implementations)
- Page previews now pass additional HTTP headers, to simulate the page being viewed by the logged-in user and avoid clashes with middleware (Robert Rollins)
- Added back buttons to page delete and unpublish confirmation screens (Matt Westcott)
- Recognise Flickr embed URLs using HTTPS (Danielle Madeley)
- Success message when publishing a page now correctly respects custom URLs defined on the specific page class (Chris Darko)
- Required blocks inside StreamField are now indicated with asterisks (Stephen Rice)

## Bug fixes

- Email templates and document uploader now support custom `STATICFILES_STORAGE` (Jonny Scholes)
- Removed alignment options (deprecated in HTML and not rendered by Wagtail) from TableBlock context menu (Moritz Pfeiffer)
- Fixed incorrect CSS path on ModelAdmin’s “choose a parent page” view
- Prevent empty redirect by overnormalisation
- “Remove link” button in rich text editor didn’t trigger “edit” event, leading to the change to sometimes not be persisted (Matt Westcott)
- RichText values can now be correctly evaluated as booleans (Mike Dingjan, Bertrand Bordage)
- `wagtailforms` no longer assumes an `.html` extension when determining the landing page template filename (kakulukia)
- Fixed styling glitch on bi-colour icon + text buttons in Chrome (Janneke Janssen)
- StreamField can now be used in an InlinePanel (Gagaro)
- StreamField block renderings using templates no longer undergo double escaping when using Jinja2 (Aymeric Augustin)
- RichText objects no longer undergo double escaping when using Jinja2 (Aymeric Augustin, Matt Westcott)
- Saving a page by pressing enter key no longer triggers a “Changes may not be saved message” (Sean Muck, Matt Westcott)

- RoutablePageMixin no longer breaks in the presence of instance-only attributes such as those generated by FileFields (Fábio Macêdo Mendes)
- The --schema-only flag on update\_index no longer expects an argument (Karl Hobley)
- Added file handling to support custom user add/edit forms with images/files (Eraldo Energy)
- Placeholder text in modeladmin search now uses the correct template variable (Adriaan Tijsseling)
- Fixed bad SQL syntax for updating URL paths on Microsoft SQL Server (Jesse Legg)
- Added workaround for Django 1.10 bug <https://code.djangoproject.com/ticket/27037> causing forms with file upload fields to fail validation (Matt Westcott)

## Upgrade considerations

### Form builder FormField models require a migration

There are some changes in the `wagtailforms.models.AbstractFormField` model:

- The `choices` field has been changed from a `CharField` to a `TextField`, to allow it to be of unlimited length;
- The help text for the `to_address` field has been changed: it now gives more information on how to specify multiple addresses.

These changes require migration. If you are using the `wagtailforms` module in your project, you will need to run `python manage.py makemigrations` and `python manage.py migrate` after upgrading, in order to apply changes to your form page models.

### TagSearchable needs removing from custom image / document model migrations

The mixin class `wagtail.wagtailadmin.taggable.TagSearchable`, used internally by image and document models, has been deprecated. If you are using custom image or document models in your project, the migration(s) which created them will contain frozen references to `wagtail.wagtailadmin.taggable.TagSearchable`, which must now be removed. The line:

```
import wagtail.wagtailadmin.taggable
```

should be replaced by:

```
import wagtail.wagtailsearch.index
```

and the line:

```
bases=(models.Model, wagtail.wagtailadmin.taggable.TagSearchable),
```

should be updated to:

```
bases=(models.Model, wagtail.wagtailsearch.index.Indexed),
```

### render and render\_basic methods on StreamField blocks now accept a context keyword argument

The `render` and `render_basic` methods on `wagtail.wagtailcore.blocks.Block` have been updated to accept an optional `context` keyword argument, a template context to use when rendering the block. If you have defined any custom StreamField blocks that override either of these methods, the method signature now needs to be updated to include this keyword argument:

```
class MyBlock(Block):  
  
    def render(self, value):  
        ...  
  
    def render_basic(self, value):  
        ...
```

should now become:

```
class MyBlock(Block):  
  
    def render(self, value, context=None):  
        ...  
  
    def render_basic(self, value, context=None):  
        ...
```

## Wagtail 1.5.3 release notes

- *What's changed*

### What's changed

#### Bug fixes

- Pin html5lib to version 0.999999 to prevent breakage caused by internal API changes (Liam Brenner)

## Wagtail 1.5.2 release notes

- *What's new*

### What's new

#### Bug fixes

- Fixed regression in 1.5.1 on editing external links (Stephen Rice)

## Wagtail 1.5.1 release notes

- *What's new*

## What's new

### Bug fixes

- When editing a document link in rich text, the document ID is no longer erroneously interpreted as a page ID (Stephen Rice)
- Removing embedded media from rich text by mouse click action now gets correctly registered as a change to the field (Loic Teixeira)
- Rich text editor is no longer broken in InlinePanels (Matt Westcott, Gagarо)
- Rich text editor is no longer broken in settings (Matt Westcott)
- Link tooltip now shows correct urls for newly inserted document links (Matt Westcott)
- Now page chooser (in a rich text editor) opens up at the link's parent page, rather than at the page itself (Matt Westcott)
- Reverted fix for explorer menu scrolling with page content, as it blocked access to menus that exceed screen height
- Image listing in the image chooser no longer becomes unpaginated after an invalid upload form submission (Stephen Rice)
- Confirmation message on the ModelAdmin delete view no longer errors if the model's string representation depends on the primary key (Yannick Chabbert)
- Applied correct translation tags for ‘permanent’ / ‘temporary’ labels on redirects (Matt Westcott)

## Wagtail 1.5 release notes

- *What's new*
  - *Upgrade considerations*

## What's new

### Reorganised page explorer actions

The screenshot shows the Wagtail Page Explorer interface. At the top, there's a teal header bar with the title "People". Below it, a row of buttons: "EDIT", "LIVE", a green button with a plus sign labeled "ADD CHILD PAGE", and a "MORE" dropdown menu. To the right of these buttons is the text "1 minute ago". The main content area lists two items: "James Joyce" and "David Mitchell". Each item has its own row with "TITLE" and "UPDATED" columns. Under "James Joyce", the status is "UPDATED" and the last update was "2 weeks, 2 days ago". Below each item are four small buttons: "EDIT", "DRAFT", "LIVE", and "ADD CHILD PAGE". The "MORE" button is highlighted with a dashed border. A dropdown menu is open over the "MORE" button for "David Mitchell", listing "Move", "Copy", "Delete", "Unpublish", and "Revisions".

The action buttons on the page explorer have been reorganised to reduce clutter, and lesser-used actions have been moved to a “More” dropdown. A new hook `register_page_listing_buttons` has been added for adding custom action buttons to the page explorer.

### ModelAdmin

Wagtail now includes an app `wagtail.contrib.modeladmin` (previously available separately as the `wagtailmodeladmin` package) which allows you to configure arbitrary Django models to be listed, added and edited through the Wagtail admin.

The screenshot shows the Wagtail admin interface for the 'COUNTRIES' model. The left sidebar includes links for 'Search', 'Explorer', 'Images', 'Documents', 'Snippets', and 'Countries'. The main content area displays a table with three rows: China (Asia, 137657000), India (Asia, 128902000), and Indonesia (Asia, 258705000). A 'FILTER' sidebar on the right lists continents: ALL, AFRICA, ANTARCTICA, ASIA (selected), AUSTRALIA, EUROPE, NORTH AMERICA, and SOUTH AMERICA. The bottom of the screen shows the message 'Page 1 of 1.'

See [ModelAdmin](#) for full documentation. This feature was developed by Andy Babic.

### TableBlock

TableBlock, a new StreamField block type for editing table-based content, is now available through the `wagtail.contrib.table_block` module.

The screenshot shows the Wagtail admin interface for a StreamField block titled 'BODY'. The block contains a table with two columns: 'Moritz Pfeiffer' and 'David Seddon'. A context menu is open over the table, listing options: Insert row above, Insert row below, Insert column on the left, Insert column on the right, Remove row, Remove column, Undo, Redo, Read only, and Alignment. The bottom of the screen shows the 'SAVE DRAFT' and 'PREVIEW' buttons, along with a note: 'Last modified: 1 May 2016, 2:44 p.m. by bbusenius'.

See [TableBlock](#) for documentation. This feature was developed by Moritz Pfeiffer, David Seddon and Brad Busenius.

### Improved link handling in rich text

The user experience around inserting, editing and removing links inside rich text areas has been greatly improved: link destinations are shown as tooltips, and existing links can be edited as well as unlinked. This feature was developed by Loic Teixeira.

### Improvements to the “Image serve view”

#### *Dynamic image serve view*

This view, which is used for requesting image thumbnails from an external app, has had some improvements made to it in this release.

- A “[redirect](#)” action has been added which will redirect the user to where the resized image is hosted rather than serving it from the app. This may be beneficial for performance if the images are hosted externally (eg, S3)
- It now takes an optional extra path component which can be used for appending a filename to the end of the URL
- The key is now configurable on the view so you don’t have to use your project’s SECRET\_KEY
- It’s been refactored into a class based view and you can now create multiple serve views with different image models and/or keys
- It now supports [serving image files using django-sendfile](#) (Thanks to Yannick Chabbert for implementing this)

### Minor features

- Password reset email now reminds the user of their username (Matt Westcott)
- Added [jinja2 support](#) for the `settings` template tag (Tim Heap)
- Added ‘revisions’ action to pages list (Roel Bruggink)
- Added a hook `insert_global_admin_js` for inserting custom JavaScript throughout the admin backend (Tom Dyson)
- Recognise instagram embed URLs with www prefix (Matt Westcott)
- The type of the `search_fields` attribute on Page models (and other searchable models) has changed from a tuple to a list (see upgrade consideration below) (Tim Heap)
- Use `PasswordChangeForm` when user changes their password, requiring the user to enter their current password (Matthijs Melissen)
- Highlight current day in date picker (Jonas Lergell)
- Eliminated the deprecated `register.assignment_tag` on Django 1.9 (Josh Schneier)
- Increased size of Save button on site settings (Liam Brenner)
- Optimised `Site.find_for_request` to only perform one database query (Matthew Downey)
- Notification messages on creating / editing sites now include the site name if specified (Chris Rogers)
- Added `--schema-only` option to `update_index` management command
- Added meaningful default icons to StreamField blocks (Benjamin Bach)

- Added title text to action buttons in the page explorer (Liam Brenner)
- Changed project template to explicitly import development settings via `settings.dev` (Tomas Olander)
- Improved L10N and I18N for revisions list (Roel Bruggink)
- The multiple image uploader now displays details of server errors (Nigel Fletton)
- Added `WAGTAIL_APPEND_SLASH` setting to determine whether page URLs end in a trailing slash - see [Append Slash](#) (Andrew Tork Baker)
- Added auto resizing text field, richtext field, and snippet chooser to styleguide (Liam Brenner)
- Support field widget media inside StreamBlock blocks (Karl Hobley)
- Spinner was added to Save button on site settings (Liam Brenner)
- Added success message after logout from Admin (Liam Brenner)
- Added `get_upload_to` method to `AbstractRendition` which, when overridden, allows control over where image renditions are stored (Rob Moggach and Matt Westcott)
- Added a mechanism to customise the add / edit user forms for custom user models - see [Custom user models](#) (Nigel Fletton)
- Added internal provision for swapping in alternative rich text editors (Karl Hobley)

### Bug fixes

- The currently selected day is now highlighted only in the correct month in date pickers (Jonas Lergell)
- Fixed crash when an image without a source file was resized with the “dynamic serve view”
- Registered settings admin menu items now show active correctly (Matthew Downey)
- Direct usage of `Document` model replaced with `get_document_model` function in `wagtail.contrib.wagtailmedusa` and in `wagtail.contrib.wagtailapi`
- Failures on sending moderation notification emails now produce a warning, rather than crashing the admin page outright (Matt Fozard)
- All admin forms that could potentially include file upload fields now specify `multipart/form-data` where appropriate (Tim Heap)
- REM units in Wagtailuserbar caused incorrect spacing (Vincent Audebert)
- Explorer menu no longer scrolls with page content (Vincent Audebert)
- `decorate_urlpatterns` now uses `functools.update_wrapper` to keep view names and docstrings (Mario César)
- StreamField block controls are no longer hidden by the StreamField menu when prepending a new block (Vincent Audebert)
- Removed invalid use of `__` alias that prevented strings getting picked up for translation (Juha Yrjölä)
- [`Routable pages`](#) without a main view no longer raise a `TypeError` (Bojan Mihelac)
- Fixed `UnicodeEncodeError` in `wagtailforms` when downloading a CSV for a form containing non-ASCII field labels on Python 2 (Mikalai Radchuk)
- Server errors during search indexing on creating / updating / deleting a model are now logged, rather than causing the overall operation to fail (Karl Hobley)
- Objects are now correctly removed from search indexes on deletion (Karl Hobley)

## Upgrade considerations

### Buttons in admin now require class="button"

The Wagtail admin CSS has been refactored for maintainability, and buttons now require an explicit `button` class. (Previously, the styles were applied on all inputs of type "submit", "reset" or "button".) If you have created any apps that extend the Wagtail admin with new views / templates, you will need to add this class to all buttons.

### The `search_fields` attribute on models should now be set to a list

On searchable models (eg, Page or custom Image models) the `search_fields` attribute should now be a list instead of a tuple.

For example, the following Page model:

```
class MyPage(Page):
    ...

    search_fields = Page.search_fields + (
        indexed.SearchField('body'),
    )
```

Should be changed to:

```
class MyPage(Page):
    ...

    search_fields = Page.search_fields + [
        indexed.SearchField('body'),
    ]
```

To ease the burden on third-party modules, adding tuples to `Page.search_fields` will still work. But this backwards-compatibility fix will be removed in Wagtail 1.7.

### Elasticsearch backend now defaults to verifying SSL certs

Previously, if you used the Elasticsearch backend, configured with the `URLS` property like:

```
WAGTAILSEARCH_BACKENDS = {
    'default': {
        'BACKEND': 'wagtail.wagtailsearch.backends.elasticsearch',
        'URLS': ['https://example.com/'],
    }
}
```

Elasticsearch would not be configured to verify SSL certificates for HTTPS URLs. This has been changed so that SSL certificates are verified for HTTPS connections by default.

If you need the old behaviour back, where SSL certificates are not verified for your HTTPS connection, you can configure the Elasticsearch backend with the `HOSTS` option, like so:

```
WAGTAILSEARCH_BACKENDS = {
    'default': {
        'BACKEND': 'wagtail.wagtailsearch.backends.elasticsearch',
        'HOSTS': [{
            'host': 'example.com'
        }]
    }
}
```

```
        'use_ssl': True,
        'verify_certs': False,
    }],
}
}
```

See the [Elasticsearch-py documentation](#) for more configuration options.

### Project template now imports `settings.dev` explicitly

In previous releases, the project template's `settings/__init__.py` file was set up to import the development settings (`settings/dev.py`), so that these would be picked up as the default (i.e. whenever a settings module was not specified explicitly). However, in some setups this meant that the development settings were being inadvertently imported in production mode.

For this reason, the import in `settings/__init__.py` has now been removed, and commands must now specify `myproject.settings.dev` or `myproject.settings.production` as appropriate; the supporting scripts (such as `manage.py`) have been updated accordingly. As this is a change to the project template, existing projects are not affected; however, if you have any common scripts or configuration files that rely on importing `myproject.settings` as the settings module, these will need to be updated in order to work on projects created under Wagtail 1.5.

## Wagtail 1.4.6 release notes

- *What's changed*

### What's changed

#### Bug fixes

- Pin `html5lib` to version 0.999999 to prevent breakage caused by internal API changes (Liam Brenner)

## Wagtail 1.4.5 release notes

- *What's changed*

### What's changed

#### Bug fixes

- Paste / drag operations done entirely with the mouse are now correctly picked up as edits within the rich text editor (Matt Fozard)
- Logic for cancelling the “unsaved changes” check on form submission has been fixed to work cross-browser (Stephen Rice)

- The “unsaved changes” confirmation was erroneously shown on IE / Firefox when previewing a page with validation errors (Matt Westcott)
- The up / down / delete controls on the “Promoted search results” form no longer trigger a form submission (Matt Westcott)
- Opening preview window no longer performs user-agent sniffing, and now works correctly on IE11 (Matt Westcott)
- Tree paths are now correctly assigned when previewing a newly-created page underneath a parent with deleted children (Matt Westcott)
- Added BASE\_URL setting back to project template
- Clearing the search box in the page chooser now returns the user to the browse view (Matt Westcott)
- The above fix also fixed an issue where Internet Explorer got stuck in the search view upon opening the page chooser (Matt Westcott)

## Wagtail 1.4.4 release notes

- *What's changed*

### What's changed

#### Translations

- New translation for Slovenian (Mitja Pagon)

#### Bug fixes

- The wagtailuserbar template tag now gracefully handles situations where the `request` object is not in the template context (Matt Westcott)
- Meta classes on StreamField blocks now handle multiple inheritance correctly (Tim Heap)
- Now user can upload images / documents only into permitted collection from choosers
- Keyboard shortcuts for save / preview on the page editor no longer incorrectly trigger the “unsaved changes” message (Jack Paine / Matt Westcott)
- Redirects no longer fail when both a site-specific and generic redirect exist for the same URL path (Nick Smith, João Luiz Lorencetti)
- Wagtail now checks that Group is registered with the Django admin before unregistering it (Jason Morrison)
- Previewing inaccessible pages no longer fails with `ALLOWED_HOSTS = ['*']` (Robert Rollins)
- The submit button ‘spinner’ no longer activates if the form has client-side validation errors (Jack Paine, Matt Westcott)
- Overriding `MESSAGE_TAGS` in project settings no longer causes messages in the Wagtail admin to lose their styling (Tim Heap)
- Border added around explorer menu to stop it blending in with StreamField block listing; also fixes invisible explorer menu in Firefox 46 (Alex Gleason)

## Wagtail 1.4.3 release notes

- *What's changed*

### What's changed

#### Bug fixes

- Fixed regression introduced in 1.4.2 which caused Wagtail to query the database during a system check (Tim Heap)

## Wagtail 1.4.2 release notes

- *What's changed*

### What's changed

#### Bug fixes

- Streamfields no longer break on validation error
- Number of validation errors in each tab in the editor is now correctly reported again
- Userbar now opens on devices with both touch and mouse (Josh Barr)
- `wagtail.wagtailadmin.wagtail_hooks` no longer calls `static` during app load, so you can use `ManifestStaticFilesStorage` without calling the `collectstatic` command
- Fixed crash on page save when a custom Page edit handler has been specified using the `edit_handler` attribute (Tim Heap)

## Wagtail 1.4.1 release notes

- *What's changed*

### What's changed

#### Bug fixes

- Fixed erroneous rendering of up arrow icons (Rob Moorman)

## Wagtail 1.4 release notes

- *What's new*
- *Upgrade considerations*

### What's new

#### Page revision management



From the page editing interface, editors can now access a list of previous revisions of the page, and preview or roll back to any earlier revision.

#### Collections for image / document organisation

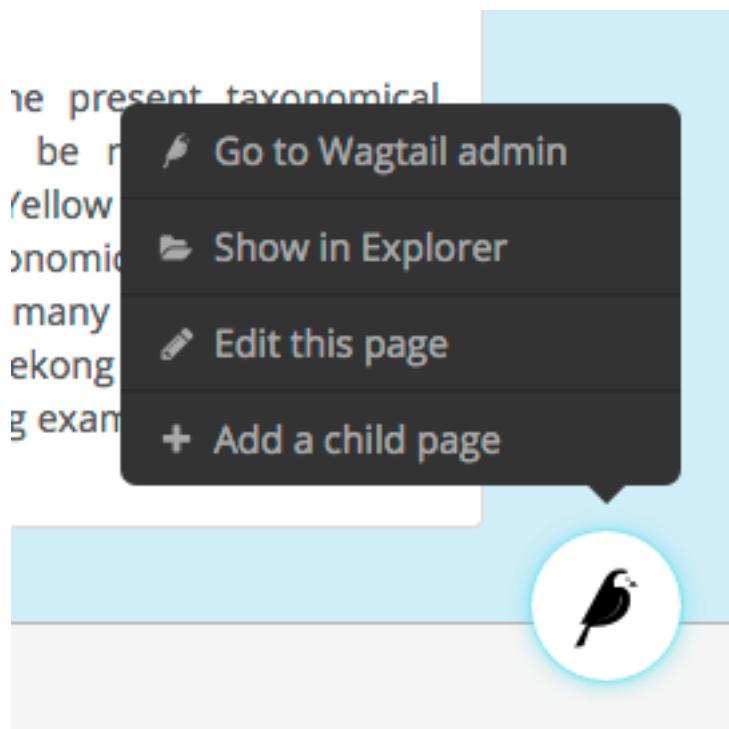
Images and documents can now be organised into collections, set up by administrators through the Settings -> Collections menu item. User permissions can be set either globally (on the 'Root' collection) or on individual collections, allowing different user groups to keep their media items separated. Thank you to the University of South Wales for sponsoring this feature.

#### Redesigned userbar

The Wagtail userbar (which gives editors quick access to the admin from the site frontend) has been redesigned, and no longer depends on an iframe. The new design allows more flexibility in label text, more configurable positioning to avoid overlapping with site navigation, and adds a new "Show in Explorer" option. This feature was developed by Thomas Winter and Gareth Price.

#### Protection against unsaved changes

The page editor interface now produces a warning if the user attempts to navigate away while there are unsaved changes.



### Multiple document uploader

The “Add a document” interface now supports uploading multiple documents at once, in the same way as uploading images.

### Custom document models

The Document model can now be overridden using the new `WAGTAILDOCS_DOCUMENT_MODEL` setting. This works in the same way that `WAGTAILIMAGES_IMAGE_MODEL` works for Image.

### Removed django-compressor dependency

Wagtail no longer depends on the `django-compressor` library. While we highly recommend compressing and bundling the CSS and Javascript on your sites, using `django-compressor` places additional installation and configuration demands on the developer, so this has now been made optional.

### Minor features

- The page search interface now searches all fields instead of just the title (Kait Crawford)
- Snippets now support a custom `edit_handler` property; this can be used to implement a tabbed interface, for example. See [Customising the tabbed interface](#) (Mikalai Radchuk)
- Date/time pickers now respect the locale’s ‘first day of week’ setting (Peter Quade)
- Refactored the way forms are constructed for the page editor, to allow custom forms to be used
- Notification message on publish now indicates whether the page is being published now or scheduled for publication in future (Chris Rogers)

- Server errors when uploading images / documents through the chooser modal are now reported back to the user (Nigel Fletton)
- Added a hook `insert_global_admin_css` for inserting custom CSS throughout the admin backend (Tom Dyson)
- Added a hook `construct_explorer_page_queryset` for customising the set of pages displayed in the page explorer
- Page models now perform field validation, including testing slugs for uniqueness within a parent page, at the model level on saving
- Page slugs are now auto-generated at the model level on page creation if one has not been specified explicitly
- The `Page` model now has two new methods `get_site()` and `get_url_parts()` to aid with customising the page URL generation logic
- Upgraded jQuery to 2.2.1 (Charlie Choiniere)
- Multiple homepage summary items (`construct_homepage_summary_items` hook) now better vertically spaced (Nicolas Kuttler)
- Email notifications can now be sent in HTML format. See [Email Notifications format](#) (Mike Dingjan)
- `StreamBlock` now has provision for throwing non-field-specific validation errors
- Wagtail now works with Willow 0.3, which supports auto-correcting the orientation of images based on EXIF data
- New translations for Hungarian, Swedish (Sweden) and Turkish

## Bug fixes

- Custom page managers no longer raise an error when used on an abstract model
- Wagtail's migrations are now all reversible (Benjamin Bach)
- Deleting a page content type now preserves existing pages as basic `Page` instances, to prevent tree corruption
- The `Page.path` field is now explicitly given the “C” collation on PostgreSQL to prevent tree ordering issues when using a database created with the Slovak locale
- Wagtail's compiled static assets are now put into the correct directory on Windows (Aarni Koskela)
- `ChooserBlock` now correctly handles models with primary keys other than `id` (alexpilot11)
- Fixed typo in Wistia oEmbed pattern (Josh Hurd)
- Added more accurate help text for the Administrator flag on user accounts (Matt Fozard)
- Tags added on the multiple image uploader are now saved correctly
- Documents created by a user are no longer deleted when the user is deleted
- Fixed a crash in `RedirectMiddleware` when a middleware class before `SiteMiddleware` returns a response (Josh Schneier)
- Fixed error retrieving the moderator list on pages that are covered by multiple moderator permission records (Matt Fozard)
- Ordering pages in the explorer by reverse ‘last updated’ time now puts pages with no revisions at the top
- WagtailTestUtils now works correctly on custom user models without a `username` field (Adam Bolfik)
- Logging in to the admin as a user with valid credentials but no admin access permission now displays an error message, rather than rejecting the user silently
- `StreamBlock` HTML rendering now handles non-ASCII characters correctly on Python 2 (Mikalai Radchuk)

- Fixed a bug preventing pages with a `OneToOneField` from being copied (Liam Brenner)
- SASS compilation errors during Wagtail development no longer cause exit of Gulp process, instead throws error to console and continues (Thomas Winter)
- Explorer page listing now uses specific page models, so that custom URL schemes defined on Page subclasses are respected
- Made settings menu clickable again in Firefox 46.0a2 (Juha Kujala)
- User management index view no longer assumes the presence of `username`, `first_name`, `last_name` and `email` fields on the user model (Eirik Krogstad)

### Upgrade considerations

#### Removal of django-compressor

As Wagtail no longer installs django-compressor automatically as a dependency, you may need to make changes to your site's configuration when upgrading. If your project is actively using django-compressor (that is, your site templates contain `{% compress %}` tags), you should ensure that your project's requirements explicitly include django-compressor, rather than indirectly relying on Wagtail to install it. If you are not actively using django-compressor on your site, you should update your settings file to remove the line '`compressor`' from `INSTALLED_APPS`, and remove '`compressor.finders.CompressorFinder`' from `STATICFILES_FINDERS`.

#### Page models now enforce field validation

In previous releases, field validation on Page models was only applied at the form level, meaning that creating pages directly at the model level would bypass validation. For example, if `NewsPage` is a Page model with a required `body` field, then code such as:

```
news_page = NewsPage(title="Hello", slug='hello')
parent_page = NewsIndex.objects.get()
parent_page.add_child(instance=news_page)
```

would create a page that does not comply with the validation rules. This is no longer possible, as validation is now enforced at the model level on `save()` and `save_revision()`; as a result, code that creates pages programmatically (such as unit tests, and import scripts) may need to be updated to ensure that it creates valid pages.

### Wagtail 1.3.1 release notes

- *What's changed*

#### What's changed

##### Bug fixes

- Applied workaround for failing `wagtailimages` migration on Django 1.8.8 / 1.9.1 with Postgres (see Django issue #26034)

## Wagtail 1.3 release notes

- *What's new*
- *Upgrade considerations*

### What's new

#### Django 1.9 support

Wagtail is now compatible with Django 1.9.

#### Indexing fields across relations in Elasticsearch

Fields on related objects can now be indexed in Elasticsearch using the new `indexed.RelatedFields` declaration type:

```
class Book(models.Model, index.Indexed):
    ...

    search_fields = [
        index.SearchField('title'),
        index.FilterField('published_date'),

        index.RelatedFields('author', [
            index.SearchField('name'),
            index.FilterField('date_of_birth'),
        ]),
    ]

    # Search books where their author was born after 1950
    # Both the book title and the authors name will be searched
    >>> Book.objects.filter(author__date_of_birth__gt=date(1950, 1, 1)).search("Hello")
```

See: [index.RelatedFields](#)

#### Cross-linked admin search UI

The search interface in the Wagtail admin now includes a toolbar to quickly switch between different search types - pages, images, documents and users. A new `register_admin_search_area` hook is provided for adding new search types to this toolbar.

#### Minor features

- Added `WagtailPageTests`, a helper module to simplify writing tests for Wagtail sites. See [Testing your Wagtail site](#)
- Added system checks to check the `subpage_types` and `parent_page_types` attributes of page models
- Added `WAGTAIL_PASSWORD_RESET_ENABLED` setting to allow password resets to be disabled independently of the password management interface (John Draper)

- Submit for moderation notification emails now include the editor name (Denis Voskvitsov)
- Updated fonts for more comprehensive Unicode support
- Added `.alt` attribute to image renditions
- The default `src`, `width`, `height` and `alt` attributes can now be overridden by attributes passed to the `{% image %}` tag
- Added keyboard shortcuts for preview and save in the page editor
- Added Page methods `can_exist_under`, `can_create_at`, `can_move_to` for customising page type business rules
- `wagtailadmin.utils.send_mail` now passes extra keyword arguments to Django's `send_mail` function (Matthew Downey)
- `page_unpublish` signal is now fired for each page that was unpublished by a call to `PageQuerySet.unpublish()`
- Add `get_upload_to` method to `AbstractImage`, to allow overriding the default image upload path (Ben Emery)
- Notification emails are now sent per user (Matthew Downey)
- Added the ability to override the default manager on Page models
- Added an optional human-friendly `site_name` field to sites (Timo Rieber)
- Added a system check to warn developers who use a custom Wagtail build but forgot to build the admin css
- Added success message after updating image from the image upload view (Christian Peters)
- Added a `request.is_preview` variable for templates to distinguish between previewing and live (Denis Voskvitsov)
- ‘Pages’ link on site stats dashboard now links to the site homepage when only one site exists, rather than the root level
- Added support for chaining multiple image operations on the `{% image %}` tag (Christian Peters)
- New translations for Arabic, Latvian and Slovak

### Bug fixes

- Images and page revisions created by a user are no longer deleted when the user is deleted (Rich Atkinson)
- HTTP cache purge now works again on Python 2 (Mitchel Cabuloy)
- Locked pages can no longer be unpublished (Alex Bridge)
- Site records now implement `get_by_natural_key`
- Creating pages at the root level (and any other instances of the base `Page` model) now properly respects the `parent_page_types` setting
- Settings menu now opens correctly from the page editor and styleguide views
- `subpage_types / parent_page_types` business rules are now enforced when moving pages
- Multi-word tags on images and documents are now correctly preserved as a single tag (LKozlowski)
- Changed verbose names to start with lower case where necessary (Maris Serzans)
- Invalid images no longer crash the image listing (Maris Serzans)

- MenuItem.url parameter can now take a lazy URL (Adon Metcalfe, rayrayndwiga)
- Added missing translation tag to InlinePanel ‘Add’ button (jnnns)
- Added missing translation tag to ‘Signing in...’ button text (Eugene MechanisM)
- Restored correct highlighting behaviour of rich text toolbar buttons
- Rendering a missing image through ImageChooserBlock no longer breaks the whole page (Christian Peters)
- Filtering by popular tag in the image chooser now works when using the database search backend

## Upgrade considerations

### Jinja2 template tag modules have changed location

Due to a change in the way template tags are imported in Django 1.9, it has been necessary to move the Jinja2 template tag modules from “templatetags” to a new location, “jinja2tags”. The correct configuration settings to enable Jinja2 templates are now as follows:

```
TEMPLATES = [
    # ...
    {
        'BACKEND': 'django.template.backends.jinja2.Jinja2',
        'APP_DIRS': True,
        'OPTIONS': {
            'extensions': [
                'wagtail.wagtailcore.jinja2tags.core',
                'wagtail.wagtailadmin.jinja2tags.userbar',
                'wagtail.wagtailimages.jinja2tags.images',
            ],
        },
    },
]
```

See: [Jinja2 template support](#)

### ContentType-returning methods in wagtailcore are deprecated

The following internal functions and methods in `wagtail.wagtailcore.models`, which return a list of `ContentType` objects, have been deprecated. Any uses of these in your code should be replaced by the corresponding new function which returns a list of model classes instead:

- `get_page_types()` - replaced by `get_page_models()`
- `Page.clean_subpage_types()` - replaced by `Page.clean_subpage_models()`
- `Page.clean_parent_page_types()` - replaced by `Page.clean_parent_page_models()`
- `Page.allowed_parent_page_types()` - replaced by `Page.allowed_parent_page_models()`
- `Page.allowed_subpage_types()` - replaced by `Page.allowed_subpage_models()`

In addition, note that these methods now return page types that are marked as `is_creatable = False`, including the base `Page` class. (Abstract models are not included, as before.)

## Wagtail 1.2 release notes

- *What's new*
- *Upgrade considerations*

### What's new

#### Site settings module

Wagtail now includes a contrib module (previously available as the `wagtailsettings` package) to allow administrators to edit site-specific settings.

See: [Site settings](#)

#### Jinja2 support

The core templatetags (`pageurl`, `slugurl`, `image`, `richtext` and `wagtailuserbar`) are now compatible with Jinja2 so it's now possible to use Jinja2 as the template engine for your Wagtail site.

Note that the variable name `self` is reserved in Jinja2, and so Wagtail now provides alternative variable names where `self` was previously used: `page` to refer to page objects, and `value` to refer to StreamField blocks. All code examples in this documentation have now been updated to use the new variable names, for compatibility with Jinja2; however, users of the default Django template engine can continue to use `self`.

See: [Jinja2 template support](#)

#### Site-specific redirects

You can now create redirects for a particular site using the admin interface.

#### Search API improvements

Wagtail's image and document models now provide a `search` method on their QuerySets, making it easy to perform searches on filtered data sets. In addition, search methods now accept two new keyword arguments:

- `operator`, to determine whether multiple search terms will be treated as 'or' (any term may match) or 'and' (all terms must match);
- `order_by_relevance`, set to `True` (the default) to order by relevance or `False` to preserve the QuerySet's original ordering.

See: [Searching](#)

#### `max_num` and `min_num` parameters on inline panels

Inline panels now accept the optional parameters `max_num` and `min_num`, to specify the maximum / minimum number of child items that must exist in order for the page to be valid.

See: [Inline Panels and Model Clusters](#)

### get\_context on StreamField blocks

StreamField blocks now *provide a get\_context method* that can be overridden to pass additional variables to the block's template.

### Browsable API

The Wagtail API now incorporates the browsable front-end provided by Django REST Framework. Note that this must be enabled by adding '`rest_framework`' to your project's `INSTALLED_APPS` setting.

### Python 3.5 support

Wagtail now supports Python 3.5 when run in conjunction with Django 1.8.6 or later.

### Minor features

- WagtailRedirectMiddleware can now ignore the query string if there is no redirect that exactly matches it
- Order of URL parameters now ignored by redirect middleware
- Added SQL Server compatibility to image migration
- Added classnames to Wagtail rich text editor buttons to aid custom styling
- Simplified body\_class in default homepage template
- page\_published signal now called with the revision object that was published
- Added a favicon to the admin interface, customisable by overriding the `branding_favicon` block (see *Custom branding*).
- Added spinner animations to long-running form submissions
- The EMBEDLY\_KEY setting has been renamed to WAGTAILEMBEDS\_EMBEDLY\_KEY
- StreamField blocks are now added automatically, without showing the block types menu, if only one block type exists (Alex Gleason)
- The first\_published\_at and latest\_revision\_created\_at fields on page models are now available as filter fields on search queries
- Wagtail admin now standardises on a single thumbnail image size, to reduce the overhead of creating multiple renditions
- Rich text fields now strip out HTML comments
- Page editor form now sets `enctype="multipart/form-data"` as appropriate, allowing FileField to be used on page models (Petr Vacha)
- Explorer navigation menu on a completely empty page tree now takes you to the root level, rather than doing nothing
- Added animation and fixed display issues when focusing a rich text field (Alex Gleason)
- Added a system check to warn if Pillow is compiled without JPEG / PNG support
- Page chooser now prevents users from selecting the root node where this would be invalid
- New translations for Dutch (Netherlands), Georgian, Swedish and Turkish (Turkey)

### Bug fixes

- Page slugs are no longer auto-updated from the page title if the page is already published
- Deleting a page permission from the groups admin UI does not immediately submit the form
- Wagtail userbar is shown on pages that do not pass a `page` variable to the template (e.g. because they override the `serve` method)
- `request.site` now set correctly on page preview when the page is not in the default site
- Project template no longer raises a deprecation warning (Maximilian Stauss)
- `PageManager.sibling_of(page)` and `PageManager.not_sibling_of(page)` now default to inclusive (i.e. page is considered a sibling of itself), for consistency with other sibling methods
- The “view live” button displayed after publishing a page now correctly reflects any changes made to the page slug (Ryan Pineo)
- API endpoints now accept and ignore the `_query` parameter used by jQuery for cache-busting
- Page slugs are no longer cut off when Unicode characters are expanded into multiple characters (Sævar Öfjörð Magnússon)
- Searching a specific page model while filtering it by either ID or tree position no longer raises an error (Ashia Zawaduk)
- Scrolling an over-long explorer menu no longer causes white background to show through (Alex Gleason)
- Removed jitter when hovering over StreamField blocks (Alex Gleason)
- Non-ASCII email addresses no longer throw errors when generating Gravatar URLs (Denis Voskvtsov, Kyle Stratis)
- Dropdown for `ForeignKey`s are now styled consistently (Ashia Zawaduk)
- Date choosers now appear on top of StreamField menus (Sergey Nikitin)
- Fixed a migration error that was raised when block-updating from 0.8 to 1.1+
- `Page.copy()` no longer breaks on models with a `ClusterTaggableManager` or `ManyToManyField`
- Validation errors when inserting an embed into a rich text area are now reported back to the editor

### Upgrade considerations

#### `PageManager.sibling_of(page)` and `PageManager.not_sibling_of(page)` have changed behaviour

In previous versions of Wagtail, the `sibling_of` and `not_sibling_of` methods behaved inconsistently depending on whether they were called on a manager (e.g. `Page.objects.sibling_of(some_page)` or `EventPage.objects.sibling_of(some_page)`) or a `QuerySet` (e.g. `Page.objects.all().sibling_of(some_page)` or `EventPage.objects.live().sibling_of(some_page)`).

Previously, the manager methods behaved as *exclusive* by default; that is, they did not count the passed-in `page` object as a sibling of itself:

```
>>> event_1 = EventPage.objects.get(title='Event 1')
>>> EventPage.objects.sibling_of(event_1)
[<EventPage: Event 2>] # OLD behaviour: Event 1 is not considered a sibling of itself
```

This has now been changed to be *inclusive* by default; that is, the `page` is counted as a sibling of itself:

```
>>> event_1 = EventPage.objects.get(title='Event 1')
>>> EventPage.objects.sibling_of(event_1)
[<EventPage: Event 1>, <EventPage: Event 2>] # NEW behaviour: Event 1 is considered a sibling of its parents
```

If the call to `sibling_of` or `not_sibling_of` is chained after another `QuerySet` method - such as `all()`, `filter()` or `live()` - behaviour is unchanged; this behaves as *inclusive*, as it did in previous versions:

```
>>> event_1 = EventPage.objects.get(title='Event 1')
>>> EventPage.objects.all().sibling_of(event_1)
[<EventPage: Event 1>, <EventPage: Event 2>] # OLD and NEW behaviour
```

If your project includes queries that rely on the old (exclusive) behaviour, this behaviour can be restored by adding the keyword argument `inclusive=False`:

```
>>> event_1 = EventPage.objects.get(title='Event 1')
>>> EventPage.objects.sibling_of(event_1, inclusive=False)
[<EventPage: Event 2>] # passing inclusive=False restores the OLD behaviour
```

### **Image.search and Document.search methods are deprecated**

The `Image.search` and `Document.search` methods have been deprecated in favour of the new `QuerySet`-based search mechanism - see [Searching Images, Documents and custom models](#). Code using the old `search` methods should be updated to search on `QuerySets` instead; for example:

```
Image.search("Hello", filters={'uploaded_by_user': user})
```

can be rewritten as:

```
Image.objects.filter(uploaded_by_user=user).search("Hello")
```

### **Wagtail API requires adding rest\_framework to INSTALLED\_APPS**

If you have the Wagtail API (`wagtail.contrib.wagtailapi`) enabled, you must now add '`rest_framework`' to your project's `INSTALLED_APPS` setting. In the current version the API will continue to function without this app, but the browsable front-end will not be available; this ability will be dropped in a future release.

### **Page.get\_latest\_revision\_as\_page() now returns live page object when there are no draft changes**

If you have any application code that makes direct updates to page data, at the model or database level, be aware that the way these edits are reflected in the page editor has changed.

Previously, the `get_latest_revision_as_page` method - used by the page editor to return the current page revision for editing - always retrieved data from the page's revision history. Now, it will only do so if the page has unpublished changes (i.e. the page is in `live + draft` state) - pages which have received no draft edits since being published will return the page's live data instead.

As a result, any changes made directly to a live page object will be immediately reflected in the editor without needing to update the latest revision record (but note, the old behaviour is still used for pages in `live + draft` state).

## **Wagtail 1.1 release notes**

- [What's new](#)
- [Upgrade considerations](#)

### What's new

#### **specific() method on PageQuerySet**

Usually, an operation that retrieves a queryset of pages (such as `homepage.get_children()`) will return them as basic Page instances, which only include the core page data such as title. The `specific()` method (e.g. `homepage.get_children().specific()`) now allows them to be retrieved as their most specific type, using the minimum number of queries.

#### **“Promoted search results” has moved into its own module**

Previously, this was implemented in `wagtailsearch` but now has been moved into a separate module: `wagtail.contrib.wagtailsearchpromotions`

#### **Atomic rebuilding of Elasticsearch indexes**

The Elasticsearch search backend now accepts an experimental `ATOMIC_REBUILD` flag which ensures that the existing search index continues to be available while the `update_index` task is running. See [ATOMIC\\_REBUILD](#).

#### **The wagtailapi module now uses Django REST Framework**

The `wagtailapi` module is now built on Django REST Framework and it now also has a [library of serialisers](#) that you can use in your own REST Framework based APIs. No user-facing changes have been made.

We hope to support more REST framework features, such as a browsable API, in future releases.

#### **Permissions fixes in the admin interface**

A number of inconsistencies around permissions in the admin interface were fixed in this release:

- Removed all permissions for “User profile” (not used)
- Removed “delete” permission for Images and documents (not used)
- Users can now access images and documents when they only have the “change” permission (previously required “add” permission as well)
- Permissions for Users now taken from custom user model, if set (previously always used permissions on Djangos builtin User model)
- Groups and Users now respond consistently to their respective “add”, “change” and “delete” permissions

#### **Searchable snippets**

Snippets that inherit from `wagtail.wagtailsearch.index.Indexed` are now given a search box on the snippet chooser and listing pages. See [Making Snippets Searchable](#).

## Minor features

- Implemented deletion of form submissions
- Implemented pagination in the page chooser modal
- Changed INSTALLED\_APPS in project template to list apps in precedence order
- The `{% image %}` tag now supports filters on the image variable, e.g. `{% image primary_img|default:secondary_img width=500 %}`
- Moved the style guide menu item into the Settings sub-menu
- Search backends can now be specified by module (e.g. `wagtail.wagtailsearch.backends.elasticsearch`), rather than a specific class (`wagtail.wagtailsearch.backends.elasticsearch.ElasticSearch`)
- Added descendant\_of filter to the API
- Added optional directory argument to “wagtail start” command
- Non-superusers can now view/edit/delete sites if they have the correct permissions
- Image file size is now stored in the database, to avoid unnecessary filesystem lookups
- Page URL lookups hit the cache/database less often
- Updated URLs within the admin backend to use namespaces
- The `update_index` task now indexes objects in batches of 1000, to indicate progress and avoid excessive memory use
- Added database indexes on `PageRevision` and `Image` to improve performance on large sites
- Search in page chooser now uses Wagtail’s search framework, to order results by relevance
- `PageChooserPanel` now supports passing a list (or tuple) of accepted page types
- The snippet type parameter of `SnippetChooserPanel` can now be omitted, or passed as a model name string rather than a model class
- Added aliases for the `self` template variable to accommodate Jinja as a templating engine: `page` for pages, `field_panel` for field panels / edit handlers, and `value` for blocks
- Added signposting text to the explorer to steer editors away from creating pages at the root level unless they are setting up new sites
- “Clear choice” and “Edit this page” buttons are no longer shown on the page field of the group page permissions form
- Altered styling of stream controls to be more like all other buttons
- Added ability to mark page models as not available for creation using the flag `is_creatable`; pages that are abstract Django models are automatically made non-creatable
- New translations for Norwegian Bokmål and Icelandic

## Bug fixes

- Text areas in the non-default tab of the page editor now resize to the correct height
- Tabs in “insert link” modal in the rich text editor no longer disappear (Tim Heap)
- H2 elements in rich text fields were accidentally given a click() binding when put insite a collapsible multi field panel

- The `wagtailimages` module is now compatible with remote storage backends that do not allow reopening closed files
- Search no longer crashes when auto-indexing a model that doesn't have an `id` field
- The `wagtailfrontendcache` module's HTTP backend has been rewritten to reliably direct requests to the configured cache hostname
- Resizing single pixel images with the “fill” filter no longer raises “ZeroDivisionError” or “tile cannot extend outside image”
- The queryset returned from `search` operations when using the database search backend now correctly preserves additional properties of the original query, such as `prefetch_related`/`select_related`
- Responses from the external image URL generator are correctly marked as streaming and will no longer fail when used with Django's cache middleware
- Page copy now works with pages that use multiple inheritance
- Form builder pages now pick up template variables defined in the `get_context` method
- When copying a page, IDs of child objects within page revision records were not remapped to the new objects; this would cause those objects to be lost from the original page when editing the new one
- Newly added redirects now take effect on all sites, rather than just the site that the Wagtail admin backend was accessed through
- Add user form no longer throws a hard error on validation failure

### Upgrade considerations

#### “Promoted search results” no longer in `wagtailsearch`

This feature has moved into a contrib module so is no longer enabled by default.

To re-enable it, add `wagtail.contrib.wagtailsearchpromotions` to your `INSTALLED_APPS`:

```
INSTALLED_APPS = [
    ...
    'wagtail.contrib.wagtailsearchpromotions',
    ...
]
```

If you have references to the `wagtail.wagtailsearch.models.EditorsPick` model in your project, you will need to update these to point to the `wagtail.contrib.wagtailsearchpromotions.models.SearchPromotion` model instead.

If you created your project using the `wagtail start` command with Wagtail 1.0, you will probably have references to this model in the `search/views.py` file.

#### `is_abstract` flag on page models has been replaced by `is_creatable`

Previous versions of Wagtail provided an undocumented `is_abstract` flag on page models - not to be confused with Django's `abstract` Meta flag - to indicate that it should not be included in the list of available page types for creation. (Typically this would be used on model classes that were designed to be subclassed to create new page types, rather than used directly.) To avoid confusion with Django's distinct concept of abstract models, this has now been replaced by a new flag, `is_creatable`.

If you have used `is_abstract = True` on any of your models, you should now change this to `is_creatable = False`.

It is not necessary to include this flag if the model is abstract in the Django sense (i.e. it has `abstract = True` in the model's `Meta` class), since it would never be valid to create pages of that type.

## Wagtail 1.0 release notes

- *What's changed*
- *Upgrade considerations*

### What's changed

#### StreamField - a field type for freeform content

StreamField provides an editing model for freeform content such as blog posts and news stories, allowing diverse content types such as text, images, headings, video and more specialised types such as maps and charts to be mixed in any order. See [Freeform page content using StreamField](#).

#### Wagtail API - A RESTful API for your Wagtail site

When installed, the new Wagtail API module provides a RESTful web API to your Wagtail site. You can use this for accessing your raw field content for your sites pages, images and documents in JSON format. See [Wagtail API](#)

#### MySQL support

Wagtail now officially supports MySQL as a database backend.

#### Django 1.8 support

Wagtail now officially supports running under Django 1.8.

#### Vanilla project template

The built-in project template is more like the Django built-in one with several Wagtail-specific additions. It includes bare minimum settings and two apps (home and search).

#### Minor changes

- Dropped Django 1.6 support
- Dropped Python 2.6 and 3.2 support
- Dropped Elasticsearch 0.90.x support
- Removed dependency on `libsass`
- Users without usernames can now be created and edited in the admin interface

- Added new translations for Croatian and Finnish

### Core

- The Page model now records the date/time that a page was first published, as the field `first_published_at`
- Increased the maximum length of a page slug from 50 to 255 characters
- Added hooks `register_rich_text_embed_handler` and `register_rich_text_link_handler` for customising link / embed handling within rich text fields
- Page URL paths can now be longer than 255 characters

### Admin UI

- Improvements to the layout of the left-hand menu footer
- Menu items of custom apps are now highlighted when being used
- Added thousands separator for counters on dashboard
- Added contextual links to admin notification messages
- When copying pages, it is now possible to specify a place to copy to
- Added pagination to the snippets listing and chooser
- Page / document / image / snippet choosers now include a link to edit the chosen item
- Plain text fields in the page editor now use auto-expanding text areas
- Added “Add child page” button to admin userbar
- Added update notifications (See: [Wagtail update notifications](#))

### Page editor

- JavaScript includes in the admin backend have been moved to the HTML header, to accommodate form widgets that render inline scripts that depend on libraries such as jQuery
- The external link chooser in rich text areas now accepts URLs of the form ‘/some/local/path’, to allow linking to non-Wagtail-controlled URLs within the local site
- Bare text entered in rich text areas is now automatically wrapped in a paragraph element

### Edit handlers API

- `FieldPanel` now accepts an optional `widget` parameter to override the field’s default form widget
- Page model fields without a `FieldPanel` are no longer displayed in the form
- No longer need to specify the base model on `InlinePanel` definitions
- Page classes can specify an `edit_handler` property to override the default Content / Promote / Settings tabbed interface. See [Customising the tabbed interface](#).

### Other admin changes

- SCSS files in `wagtailadmin` now use absolute imports, to permit overriding by user stylesheets
- Removed the dependency on `LOGIN_URL` and `LOGIN_REDIRECT_URL` settings
- Password reset view names namespaced to `wagtailadmin`
- Removed the need to add permission check on admin views (now automated)

- Reversing `django.contrib.auth.admin.login` will no longer lead to Wagtails login view (making it easier to have frontend login views)
- Added cache-control headers to all admin views. This allows Varnish/Squid/CDN to run on vanilla settings in front of a Wagtail site
- Date / time pickers now consistently use times without seconds, to prevent JavaScript behaviour glitches when focusing / unfocusing fields
- Added hook `construct_homepage_summary_items` for customising the site summary panel on the admin homepage
- Renamed the `construct_wagtail_edit_bird` hook to `construct_wagtail_userbar`
- ‘static’ template tags are now used throughout the admin templates, in place of `STATIC_URL`

## Docs

- Support for `django-sendfile` added
- Documents now served with correct mime-type
- Support for `If-Modified-Since` HTTP header

## Search

- Search view accepts “page” GET parameter in line with pagination
- Added `AUTO_UPDATE` flag to search backend settings to enable/disable automatically updating the search index on model changes

## Routable pages

- Added a new decorator-based syntax for RoutablePage, compatible with Django 1.8

## Bug fixes

- The `document_served` signal now correctly passes the Document class as `sender` and the document as `instance`
- Image edit page no longer throws `OSError` when the original image is missing
- Collapsible blocks stay open on any form error
- Document upload modal no longer switches tabs on form errors
- `with_metaclass` is now imported from Django’s bundled copy of the `six` library, to avoid errors on Mac OS X from an outdated system copy of the library being imported

## Upgrade considerations

### Support for older Django/Python/Elasticsearch versions dropped

This release drops support for Django 1.6, Python 2.6/3.2 and Elasticsearch 0.90.x. Please make sure these are updated before upgrading.

If you are upgrading from Elasticsearch 0.90.x, you may also need to update the `elasticsearch` pip package to a version greater than 1.0 as well.

### Wagtail version upgrade notifications are enabled by default

Starting from Wagtail 1.0, the admin dashboard will (for admin users only) perform a check to see if newer releases are available. This also provides the Wagtail team with the hostname of your Wagtail site. If you'd rather not receive update notifications, or if you'd like your site to remain unknown, you can disable it by adding this line to your settings file:

```
WAGTAIL_ENABLE_UPDATE_CHECK = False
```

### InlinePanel definitions no longer need to specify the base model

In previous versions of Wagtail, inline child blocks on a page or snippet were defined using a declaration like:

```
InlinePanel(HomePage, 'carousel_items', label="Carousel items")
```

It is no longer necessary to pass the base model as a parameter, so this declaration should be changed to:

```
InlinePanel('carousel_items', label="Carousel items")
```

The old format is now deprecated; all existing `InlinePanel` declarations should be updated to the new format.

**Custom image models should now set the `admin_form_fields` attribute** Django 1.8 now requires that all the fields in a `ModelForm` must be defined in its `Meta.fields` attribute.

As Wagtail uses Django's `ModelForm` for creating image model forms, we've added a new attribute called `admin_form_fields` that should be set to a tuple of field names on the image model.

See [Custom image models](#) for an example.

### You no longer need `LOGIN_URL` and `LOGIN_REDIRECT_URL` to point to Wagtail admin.

If you are upgrading from an older version of Wagtail, you probably want to remove these from your project settings.

Previously, these two settings needed to be set to `wagtailadmin_login` and `wagtailadmin_dashboard` respectively or Wagtail would become very tricky to log in to. This is no longer the case and Wagtail should work fine without them.

### RoutablePage now uses decorator syntax for defining views

In previous versions of Wagtail, page types that used the `RoutablePageMixin` had endpoints configured by setting their `subpage_urls` attribute to a list of urls with view names. This will not work on Django 1.8 as view names can no longer be passed into a url (see: <https://docs.djangoproject.com/en/1.8/releases/1.8/#django-conf-urls-patterns>).

Wagtail 1.0 introduces a new syntax where each view function is annotated with a `@route` decorator - see [RoutablePageMixin](#).

The old `subpage_urls` convention will continue to work on Django versions prior to 1.8, but this is now deprecated; all existing `RoutablePage` definitions should be updated to the decorator-based convention.

### Upgrading from the external `wagtailapi` module.

If you were previously using the external `wagtailapi` module (which has now become `wagtail.contrib.wagtailapi`). Please be aware of the following backwards-incompatible changes:

## 1. Representation of foreign keys has changed

Foreign keys were previously represented by just the value of their primary key. For example:

```
"feed_image": 1
```

This has now been changed to add some `meta` information:

```
"feed_image": {
    "id": 1,
    "meta": {
        "type": "wagtailimages.Image",
        "detail_url": "http://api.example.com/api/v1/images/1/"
    }
}
```

## 2. On the page detail view, the “parent” field has been moved out of meta

Previously, there was a “parent” field in the “meta” section on the page detail view:

```
{
    "id": 10,
    "meta": {
        "type": "demo.BlogPage",
        "parent": 2
    },
    ...
}
```

This has now been moved to the top level. Also, the above change to how foreign keys are represented applies to this field too:

```
{
    "id": 10,
    "meta": {
        "type": "demo.BlogPage"
    },
    "parent": {
        "id": 2,
        "meta": {
            "type": "demo.BlogIndexPage"
        }
    },
    ...
}
```

## Celery no longer automatically used for sending notification emails

Previously, Wagtail would try to use Celery whenever the `djcelery` module was installed, even if Celery wasn’t actually set up. This could cause a very hard to track down problem where notification emails would not be sent so this functionality has now been removed.

If you would like to keep using Celery for sending notification emails, have a look at: [django-celery-email](#)

### **Login/Password reset views renamed**

It was previously possible to reverse the Wagtail login view using `django.contrib.auth.views.login`. This is no longer possible. Update any references to `wagtailadmin_login`.

Password reset view name has changed from `password_reset` to `wagtailadmin_password_reset`.

### **JavaScript includes in admin backend have been moved**

To improve compatibility with third-party form widgets, pages within the Wagtail admin backend now output their JavaScript includes in the HTML header, rather than at the end of the page. If your project extends the admin backend (through the `register_admin_menu_item` hook, for example) you will need to ensure that all associated JavaScript code runs correctly from the new location. In particular, any code that accesses HTML elements will need to be contained in an ‘onload’ handler (e.g. jQuery’s `$(document).ready()`).

### **EditHandler internal API has changed**

While it is not an official Wagtail API, it has been possible for Wagtail site implementers to define their own `EditHandler` subclasses for use in panel definitions, to customise the behaviour of the page / snippet editing forms. If you have made use of this facility, you will need to update your custom `EditHandlers`, as this mechanism has been refactored (to allow `EditHandler` classes to keep a persistent reference to their corresponding model). If you have only used Wagtail’s built-in panel types (`FieldPanel`, `InlinePanel`, `PageChooserPanel` and so on), you are unaffected by this change.

Previously, functions like `FieldPanel` acted as ‘factory’ functions, where a call such as `FieldPanel('title')` constructed and returned an `EditHandler` subclass tailored to work on a ‘title’ field. These functions now return an object with a `bind_to_model` method instead; the `EditHandler` subclass can be obtained by calling this with the model class as a parameter. As a guide to updating your custom `EditHandler` code, you may wish to refer to [the relevant change to the Wagtail codebase](#).

### **chooser\_panel templates are obsolete**

If you have added your own custom admin views to the Wagtail admin (e.g. through the `register_admin_urls` hook), you may have used one of the following template includes to incorporate a chooser element for pages, documents, images or snippets into your forms:

- `wagtailadmin/edit_handlers/chooser_panel.html`
- `wagtailadmin/edit_handlers/page_chooser_panel.html`
- `wagtaildocs/edit_handlers/document_chooser_panel.html`
- `wagtailimages/edit_handlers/image_chooser_panel.html`
- `wagtailsnippets/edit_handlers/snippet_chooser_panel.html`

All of these templates are now deprecated. Wagtail now provides a set of Django form widgets for this purpose - `AdminPageChooser`, `AdminDocumentChooser`, `AdminImageChooser` and `AdminSnippetChooser` - which can be used in place of the `HiddenInput` widget that these form fields were previously using. The field can then be rendered using the regular `wagtailadmin/shared/field.html` or `wagtailadmin/shared/field_as_li.html` template.

**document\_served signal arguments have changed**

Previously, the `document_served` signal (which is fired whenever a user downloads a document) passed the document instance as the `sender`. This has now been changed to correspond the behaviour of Django's built-in signals; `sender` is now the `Document` class, and the document instance is passed as the argument `instance`. Any existing signal listeners that expect to receive the document instance in `sender` must now be updated to check the `instance` argument instead.

**Custom image models must specify an admin\_form\_fields list**

Previously, the forms for creating and editing images followed Django's default behaviour of showing all fields defined on the model; this would include any custom fields specific to your project that you defined by subclassing `AbstractImage` and setting `WAGTAILIMAGES_IMAGE_MODEL`. This behaviour is risky as it may lead to fields being unintentionally exposed to the user, and so Django has deprecated this, for removal in Django 1.8. Accordingly, if you create your own custom subclass of `AbstractImage`, you must now provide an `admin_form_fields` property, listing the fields that should appear on the image creation / editing form - for example:

```
from wagtail.wagtailimages.models import AbstractImage, Image

class MyImage(AbstractImage):
    photographer = models.CharField(max_length=255)
    has_legal_approval = models.BooleanField()

    admin_form_fields = Image.admin_form_fields + ['photographer']
```

**construct\_wagtail\_edit\_bird hook has been renamed**

Previously you could customize the Wagtail userbar using the `construct_wagtail_edit_bird` hook. The hook has been renamed to `construct_wagtail_userbar`.

The old hook is now deprecated; all existing `construct_wagtail_edit_bird` declarations should be updated to the new hook.

**IMAGE\_COMPRESSION\_QUALITY setting has been renamed**

The `IMAGE_COMPRESSION_QUALITY` setting, which determines the quality of saved JPEG images as a value from 1 to 100, has been renamed to `WAGTAILIMAGES_JPEG_QUALITY`. If you have used this setting, please update your settings file accordingly.

**Wagtail 0.8.10 release notes**

- *What's changed*

**What's changed**

### Bug fixes

- When copying a page, IDs of child objects within page revision records were not remapped to the new objects; this would cause those objects to be lost from the original page when editing the new one
- Search no longer crashes when auto-indexing a model that doesn't have an id field (Scot Hacker)
- Resizing single pixel images with the “fill” filter no longer raises “ZeroDivisionError” or “tile cannot extend outside image”

## Wagtail 0.8.8 release notes

- *What's changed*

### What's changed

### Bug fixes

- Form builder no longer raises a `TypeError` when submitting unchecked boolean field
- Image upload form no longer breaks when using i10n thousand separators
- Multiple image uploader now escapes HTML in filenames
- Retrieving an individual item from a sliced `BaseSearchResults` object now properly takes the slice offset into account
- Removed dependency on `unicodecsv` which fixes a crash on Python 3
- Submitting unicode text in form builder form no longer crashes with `UnicodeEncodeError` on Python 2
- Creating a proxy model from a `Page` class no longer crashes in the system check
- Unrecognised embed URLs passed to the `|embed` filter no longer cause the whole page to crash with an `EmbedNotFoundException`
- Underscores no longer get stripped from page slugs

## Wagtail 0.8.7 release notes

- *What's changed*

### What's changed

### Bug fixes

- `wagtailfrontendcache` no longer tries to purge pages that are not in a site
- The contents of `<div>` elements in the rich text editor were not being whitelisted
- Due to the above issue, embeds/images in a rich text field would sometimes be saved into the database in their editor representation

- RoutablePage now prevents `subpage_urls` from being defined as a property, which would cause a memory leak
- Added validation to prevent pages being created with only whitespace characters in their title fields
- Users are no longer logged out on changing password when SessionAuthenticationMiddleware (added in Django 1.7) is in use
- Added a workaround for a Python / Django issue that prevented documents with certain non-ASCII filenames from being served

## Wagtail 0.8.6 release notes

- *What's new*
  - *Upgrade considerations*

### What's new

#### Minor features

- Translations updated, including new translations for Czech, Italian and Japanese
- The “fixtree” command can now delete orphaned pages

#### Bug fixes

- django-taggit library updated to 0.12.3, to fix a bug with migrations on SQLite on Django 1.7.2 and above (<https://github.com/alex/django-taggit/issues/285>)
- Fixed a bug that caused children of a deleted page to not be deleted if they had a different type

### Upgrade considerations

#### Orphaned pages may need deleting

This release fixes a bug with page deletion introduced in 0.8, where deleting a page with child pages will result in those child pages being left behind in the database (unless the child pages are of the same type as the parent). This may cause errors later on when creating new pages in the same position. To identify and delete these orphaned pages, it is recommended that you run the following command (from the project root) after upgrading to 0.8.6:

```
./manage.py fixtree
```

This will output a list of any orphaned pages found, and request confirmation before deleting them.

Since this now makes `fixtree` an interactive command, a `./manage.py fixtree --noinput` option has been added to restore the previous non-interactive behaviour. With this option enabled, deleting orphaned pages is always skipped.

## Wagtail 0.8.5 release notes

- *What's new*

### What's new

#### Bug fixes

- On adding a new page, the available page types are ordered by the displayed verbose name
- Active admin submenus were not properly closed when activating another
- `get_sitemap_urls` is now called on the specific page class so it can now be overridden
- (Firefox and IE) Fixed preview window hanging and not refocusing when “Preview” button is clicked again
- Storage backends that return raw `ContentFile` objects are now handled correctly when resizing images
- Punctuation characters are no longer stripped when performing search queries
- When adding tags where there were none before, it is now possible to save a single tag with multiple words in it
- `richtext` template tag no longer raises `TypeError` if `None` is passed into it
- Serving documents now uses a streaming HTTP response and will no longer break Django’s cache middleware
- User admin area no longer fails in the presence of negative user IDs (as used by `django-guardian`’s default settings)
- Password reset emails now use the `BASE_URL` setting for the reset URL
- `BASE_URL` is now included in the project template’s default settings file

## Wagtail 0.8.4 release notes

- *What's new*

### What's new

#### Bug fixes

- It is no longer possible to have the explorer and settings menu open at the same time
- Page IDs in page revisions were not updated on page copy, causing subsequent edits to be committed to the original page instead
- Copying a page now creates a new page revision, ensuring that changes to the title/slug are correctly reflected in the editor (and also ensuring that the user performing the copy is logged)
- Prevent a race condition when creating Filter objects
- On adding a new page, the available page types are ordered by the displayed verbose name

## Wagtail 0.8.3 release notes

- *What's new*
- *Upgrade considerations*

### What's new

#### Bug fixes

- Added missing jQuery UI sprite files, causing collectstatic to throw errors (most reported on Heroku)
- Page system check for on\_delete actions of ForeignKeys was throwing false positives when page class descends from an abstract class (Alejandro Giacometti)
- Page system check for on\_delete actions of ForeignKeys now only raises warnings, not errors
- Fixed a regression where form builder submissions containing a number field would fail with a JSON serialisation error
- Resizing an image with a focal point equal to the image size would result in a divide-by-zero error
- Focal point indicator would sometimes be positioned incorrectly for small or thin images
- Fix: Focal point chooser background colour changed to grey to make working with transparent images easier
- Elasticsearch configuration now supports specifying HTTP authentication parameters as part of the URL, and defaults to ports 80 (HTTP) and 443 (HTTPS) if port number not specified
- Fixed a TypeError when previewing pages that use RoutablePageMixin
- Rendering image with missing file in rich text no longer crashes the entire page
- IOErrors thrown by underlying image libraries that are not reporting a missing image file are no longer caught
- Fix: Minimum Pillow version bumped to 2.6.1 to work around a crash when using images with transparency
- Fix: Images with transparency are now handled better when being used in feature detection

### Upgrade considerations

#### Port number must be specified when running Elasticsearch on port 9200

In previous versions, an Elasticsearch connection URL in `WAGTAILSEARCH_BACKENDS` without an explicit port number (e.g. `http://localhost/`) would be treated as port 9200 (the Elasticsearch default) whereas the correct behaviour would be to use the default http/https port of 80/443. This behaviour has now been fixed, so sites running Elasticsearch on port 9200 must now specify this explicitly - e.g. `http://localhost:9200`. (Projects using the default settings, or the settings given in the Wagtail documentation, are unaffected.)

## Wagtail 0.8.1 release notes

- *What's new*

### What's new

#### Bug fixes

- Fixed a regression where images would fail to save when feature detection is active

## Wagtail 0.8 release notes

- *What's new*
- *Upgrade considerations*

### What's new

#### Minor features

- Page operations (creation, publishing, copying etc) are now logged via Python's logging framework; to configure this, add a logger entry for '`wagtail`' or '`wagtail.core`' to the `LOGGING` setup in your settings file.
- The save button on the page edit page now redirects the user back to the edit page instead of the explorer
- Signal handlers for `wagtail.wagtailsearch` and `wagtail.contrib.wagtailfrontendcache` are now automatically registered when using Django 1.7 or above.
- Added a Django 1.7 system check to ensure that foreign keys from Page models are set to `on_delete=SET_NULL`, to prevent inadvertent (and tree-breaking) page deletions
- Improved error reporting on image upload, including ability to set a maximum file size via a new setting `WAGTAILIMAGES_MAX_UPLOAD_SIZE`
- The external image URL generator now keeps persistent image renditions, rather than regenerating them on each request, so it no longer requires a front-end cache.
- Added Dutch translation

#### Bug fixes

- Replaced references of `.username` with `.get_username()` on users for better custom user model support
- Unpinned dependency versions for six and requests to help prevent dependency conflicts
- Fixed `TypeError` when getting embed HTML with `oembed` on Python 3
- Made HTML whitelisting in rich text fields more robust at catching disallowed URL schemes such as `jav\tascript:`
- `created_at` timestamps on page revisions were not being preserved on page copy, causing revisions to get out of sequence
- When copying pages recursively, revisions of sub-pages were being copied regardless of the `copy_revisions` flag
- Updated the migration dependencies within the project template to ensure that Wagtail's own migrations consistently apply first

- The cache of site root paths is now cleared when a site is deleted
- Search indexing now prevents pages from being indexed multiple times, as both the base Page model and the specific subclass
- Search indexing now avoids trying to index abstract models
- Fixed references to “username” in login form help text for better custom user model support
- Later items in a model’s search\_field list now consistently override earlier items, allowing subclasses to redefine rules from the parent
- Image uploader now accepts JPEG images that PIL reports as being in MPO format
- Multiple checkbox fields on form-builder forms did not correctly save multiple values
- Editing a page’s slug and saving it without publishing could sometimes cause the URL paths of child pages to be corrupted
- `latest_revision_created_at` was being cleared on page publish, causing the page to drop to the bottom of explorer listings
- Searches on partial\_match fields were wrongly applying prefix analysis to the search query as well as the document (causing e.g. a query for “water” to match against “wagtaiL”)

## Upgrade considerations

### Corrupted URL paths may need fixing

This release fixes a bug in Wagtail 0.7 where editing a parent page’s slug could cause the URL paths of child pages to become corrupted. To ensure that your database does not contain any corrupted URL paths, it is recommended that you run `./manage.py set_url_paths` after upgrading.

### Automatic registration of signal handlers (Django 1.7+)

Signal handlers for the wagtailsearch core app and wagtailfrontendcache contrib app are automatically registered when using Django 1.7. Calls to `register_signal_handlers` from your `urls.py` can be removed.

### Change to search API when using database backend

When using the database backend, calling `search` (either through `Page.objects.search()` or on the backend directly) will now return a `SearchResults` object rather than a Django `QuerySet` to make the database backend work more like the Elasticsearch backend.

This change shouldn’t affect most people as `SearchResults` behaves very similarly to `QuerySet`. But it may cause issues if you are calling `QuerySet` specific methods after calling `.search()`. Eg: `Page.objects.search("Hello").filter(foo="Bar")` (in this case, `.filter()` should be moved before `.search()` and it would work as before).

### Removal of validate\_image\_format from custom image model migrations (Django 1.7+)

If your project is running on Django 1.7, and you have defined a custom image model (by extending the `wagtailimages.AbstractImage` class), the migration that creates this model will probably have a reference to `wagtail.wagtailimages.utils.validators.validate_image_format`. This module has now

been removed, which will cause `manage.py migrate` to fail with an `ImportError` (even if the migration has already been applied). You will need to edit the migration file to remove the line:

```
import wagtail.wagtailimages.utils.validators
```

and the `validators` attribute of the ‘file’ field - that is, the line:

```
('file', models.ImageField(upload_to=wagtail.wagtailimages.models.get_upload_to,
    width_field='width', height_field='height',
    validators=[wagtail.wagtailimages.utils.validators.validate_image_format],
    verbose_name='File')),
```

should become:

```
('file', models.ImageField(upload_to=wagtail.wagtailimages.models.get_upload_to,
    width_field='width', height_field='height', verbose_name='File')),
```

## Wagtail 0.7 release notes

- *What’s new*
- *Upgrade considerations*

### What’s new

#### New interface for choosing image focal point

##### Focal point (optional)

To define this image's most important region, drag a box over the image below. (Current focal point shown)



When editing images, users can now specify a ‘focal point’ region that cropped versions of the image will be centred on. Previously the focal point could only be set automatically, through image feature detection.

#### Groups and Sites administration interfaces

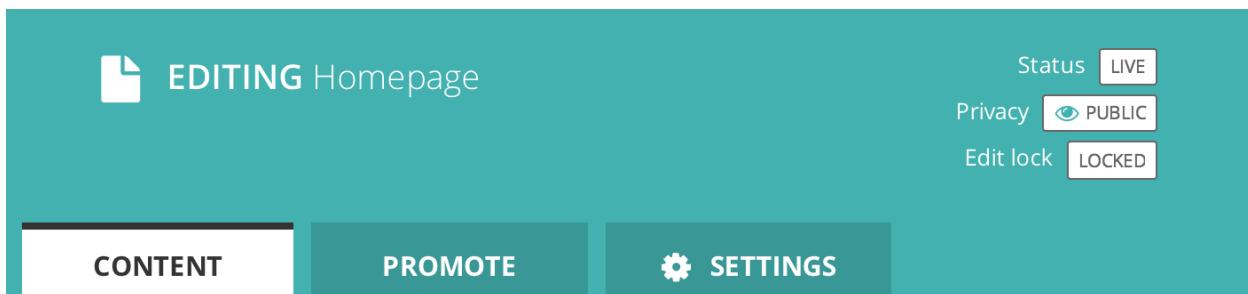
The main navigation menu has been reorganised, placing site configuration options in a ‘Settings’ submenu. This includes two new items, which were previously only available through the Django admin backend: ‘Groups’, for setting up user groups with a specific set of permissions, and ‘Sites’, for managing the list of sites served by this Wagtail instance.

The screenshot shows the Wagtail admin interface. On the left is a dark sidebar with a bird icon, a search bar, and links for Explorer, Images, Documents, and Settings. A user profile icon and 'Log out' link are at the bottom of the sidebar. The main area has a teal header bar with a paw print icon and the text 'EDITING Editors'. Below the header, the 'Name:' field contains 'Editors'. The 'OBJECT PERMISSIONS' section contains a table:

NAME	ADD	CHANGE	DELETE
Document	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Image	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User profile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The 'OTHER PERMISSIONS' section has a 'NAME' field and a checkbox for 'Can access Wagtail admin' which is checked.

### Page locking



Moderators and administrators now have the ability to lock a page, preventing further edits from being made to that page until it is unlocked again.

### Minor features

- The `content_type` template filter has been removed from the project template, as the same thing can be accomplished with `self.get_verbose_name|slugify`.
- Page copy operations now also copy the page revision history.
- Page models now support a `parent_page_types` property in addition to `subpage_types`, to restrict the types of page they can be created under.
- `register_snippet` can now be invoked as a decorator.
- The project template (used when running `wagtail start`) has been updated to Django 1.7.
- The ‘boost’ applied to the title field on searches has been reduced from 100 to 2.
- The `type` method of `PageQuerySet` (used to filter the queryset to a specific page type) now includes subclasses of the given page type.
- The `update_index` management command now updates all backends listed in `WAGTAILSEARCH_BACKENDS`, or a specific one passed on the command line, rather than just the default backend.
- The ‘fill’ image resize method now supports an additional parameter defining the closeness of the crop. See [Using images in templates](#)
- Added support for invalidating Cloudflare caches. See [Frontend cache invalidator](#)
- Pages in the explorer can now be ordered by last updated time.

### Bug fixes

- The ‘wagtail start’ command now works on Windows and other environments where the `django-admin.py` executable is not readily accessible.
- The external image URL generator no longer stores generated images in Django’s cache; this was an unintentional side-effect of setting cache control headers.
- The Elasticsearch backend can now search querysets that have been filtered with an ‘in’ clause of a non-list type (such as a `ValuesListQuerySet`).
- Logic around the `has_unpublished_changes` flag has been fixed, to prevent issues with the ‘View draft’ button failing to show in some cases.

- It is now easier to move pages to the beginning and end of their section
- Image rendering no longer creates erroneous duplicate Rendition records when the focal point is blank.

## Upgrade considerations

### Addition of wagtailsites app

The Sites administration interface is contained within a new app, `wagtailsites`. To enable this on an existing Wagtail project, add the line:

```
'wagtail.wagtailsites',
```

to the `INSTALLED_APPS` list in your project's settings file.

### Title boost on search reduced to 2

Wagtail's search interface applies a 'boost' value to give extra weighting to matches on the title field. The original boost value of 100 was found to be excessive, and in Wagtail 0.7 this has been reduced to 2. If you have used comparable boost values on other fields, to give them similar weighting to title, you may now wish to reduce these accordingly. See [Indexing](#).

### Addition of locked field to Page model

The page locking mechanism adds a `locked` field to `wagtailcore.Page`, defaulting to `False`. Any application code working with `Page` objects should be unaffected, but any code that creates page records using direct SQL, or within existing South migrations using South's frozen ORM, will fail as this code will be unaware of the new database column. To fix a South migration that fails in this way, add the following line to the '`wagtailcore.page`' entry at the bottom of the migration file:

```
'locked': ('django.db.models.fields.BooleanField', [], {'default': 'False'}),
```

### Update to focal\_point\_key field on custom Rendition models

The `focal_point_key` field on `wagtailimages.Rendition` has been changed to `null=False`, to fix an issue with duplicate renditions being created. If you have defined a custom Rendition model in your project (by extending the `wagtailimages.AbstractRendition` class), you will need to apply a migration to make the corresponding change on your custom model. Unfortunately neither South nor Django 1.7's migration system are able to generate this automatically - you will need to customise the migration produced by `./manage.py schemamigration ./manage.py makemigrations`, using the `wagtailimages` migration as a guide:

- [https://github.com/torchbox/wagtail/blob/master/wagtail/wagtailimages/south\\_migrations/0004\\_auto\\_\\_chg\\_field\\_rendition\\_focal\\_point\\_key.py](https://github.com/torchbox/wagtail/blob/master/wagtail/wagtailimages/south_migrations/0004_auto__chg_field_rendition_focal_point_key.py)  
(for South / Django 1.6)
- [https://github.com/torchbox/wagtail/blob/master/wagtail/wagtailimages/migrations/0004\\_make\\_focal\\_point\\_key\\_not\\_nullable.py](https://github.com/torchbox/wagtail/blob/master/wagtail/wagtailimages/migrations/0004_make_focal_point_key_not_nullable.py)  
(for Django 1.7)

## Wagtail 0.6 release notes

- *What's new*
- *Upgrade considerations*
- *Deprecated features*

### What's new

#### Project template and start project command

Wagtail now has a basic project template built in to make starting new projects much easier.

To use it, install `wagtail` onto your machine and run `wagtail start project_name`.

#### Django 1.7 support

Wagtail can now be used with Django 1.7.

#### Minor features

- A new template tag has been added for reversing URLs inside routable pages. See *The routablepageurl template tag*.
- RoutablePage can now be used as a mixin. See `wagtail.contrib.wagtailroutablepage.models.RoutablePage`
- MenuItems can now have bundled JavaScript
- Added the `register_admin_menu_item` hook for registering menu items at startup. See *Hooks*
- Added a version indicator into the admin interface (hover over the wagtail to see it)
- Added Russian translation

#### Bug fixes

- Page URL generation now returns correct URLs for sites that have the main ‘serve’ view rooted somewhere other than ‘/’.
- Search results in the page chooser now respect the `page_type` parameter on `PageChooserPanel`.
- Rendition filenames are now prevented from going over 60 chars, even with a large `focal_point_key`.
- Child relations that are defined on a model’s superclass (such as the base `Page` model) are now picked up correctly by the page editing form, page copy operations and the `replace_text` management command.
- Tags on images and documents are now committed to the search index immediately on saving.

#### Upgrade considerations

##### All features deprecated in 0.4 have been removed

See: *Deprecated features*

## Search signal handlers have been moved

If you have an import in your urls.py file like from wagtail.wagtailsearch import register\_signal\_handlers, this must now be changed to from wagtail.wagtailsearch.signal\_handlers import register\_signal\_handlers

## Deprecated features

- The wagtail.wagtailsearch.indexed module has been renamed to wagtail.wagtailsearch.index

## Wagtail 0.5 release notes

- *What's new*
- *Upgrade considerations*

### What's new

#### Multiple image uploader

The image uploader UI has been improved to allow multiple images to be uploaded at once.

#### Image feature detection

Wagtail can now apply face and feature detection on images using [OpenCV](#), and use this to intelligently crop images.

##### *Feature Detection*

#### Using images outside Wagtail

In normal use, Wagtail will generate resized versions of images at the point that they are referenced on a template, which means that those images are not easily accessible for use outside of Wagtail, such as displaying them on external sites. Wagtail now provides a way to obtain URLs to your images, at any size.

##### *Dynamic image serve view*

#### RoutablePage

A RoutablePage model has been added to allow embedding Django-style URL routing within a page.

##### *RoutablePageMixin*

#### Usage stats for images, documents and snippets

It's now easier to find where a particular image, document or snippet is being used on your site.

Set the WAGTAIL\_USAGE\_COUNT\_ENABLED setting to True and an icon will appear on the edit page showing you which pages they have been used on.

### Copy Page action

The explorer interface now offers the ability to copy pages, with or without subpages.

### Minor features

#### Core

- Hooks can now be defined using decorator syntax:

```
@hooks.register('construct_main_menu')
def construct_main_menu(request, menu_items):
    menu_items.append(
        MenuItem('Kittens!', '/kittens/', classnames='icon icon-folder-inverse', order=1000)
    )
```

- The lxml library (used for whitelisting and rewriting of rich text fields) has been replaced with the pure-python html5lib library, to simplify installation.
- A page\_unpublished signal has been added.

#### Admin

- Explorer nav now rendered separately and fetched with AJAX when needed.

This improves the general performance of the admin interface for large sites.

### Bug fixes

- Updates to tag fields are now properly committed to the database when publishing directly from the page edit interface.

### Upgrade considerations

#### Urlconf entries for /admin/images/, /admin/embeds/ etc need to be removed

If you created a Wagtail project prior to the release of Wagtail 0.3, it is likely to contain the following entries in its `urls.py`:

```
# TODO: some way of getting wagtailimages to register itself within wagtailadmin so that we
# don't have to define it separately here
url(r'^admin/images/', include(wagtailimages_urls)),
url(r'^admin/embeds/', include(wagtailembeds_urls)),
url(r'^admin/documents/', include(wagtaildocs_admin_urls)),
url(r'^admin/snippets/', include(wagtailsnippets_urls)),
url(r'^admin/search/', include(wagtailsearch_admin_urls)),
url(r'^admin/users/', include(wagtailusers_urls)),
url(r'^admin/redirects/', include(wagtailredirects_urls)),
```

These entries (and the corresponding from `wagtail.wagtail*` import ... lines) need to be removed from `urls.py`. (The entry for `/admin/` should be left in, however.)

Since Wagtail 0.3, the `wagtailadmin` module automatically takes care of registering these URL subpaths, so these entries are redundant, and these urlconf modules are not guaranteed to remain stable and backwards-compatible in future. Leaving these entries in place will now cause an `ImproperlyConfigured` exception to be thrown.

## New fields on Image and Rendition models

Several new fields have been added to the Image and Rendition models to support [Feature Detection](#). These will be added to the database when you run `./manage.py migrate`. If you have defined a custom image model (by extending the `wagtailimages.AbstractImage` and `wagtailimages.AbstractRendition` classes and specifying `WAGTAILIMAGES_IMAGE_MODEL` in settings), the change needs to be applied to that model's database table too. Running the command:

```
./manage.py schemamigration myapp --auto add_image_focal_point_fields
```

(with ‘myapp’ replaced with your app name) will generate the necessary migration file.

## South upgraded to 1.0

In preparation for Django 1.7 support in a future release, Wagtail now depends on South 1.0, and its migration files have been moved from `migrations` to `south_migrations`. Older versions of South will fail to find the migrations in the new location.

If your project’s requirements file (most commonly `requirements.txt` or `requirements/base.txt`) references a specific older version of South, this must be updated to South 1.0.

## Wagtail 0.4.1 release notes

### Bug fixes

- ElasticSearch backend now respects the backward-compatible URLs configuration setting, in addition to HOSTS
- Documentation fixes

## Wagtail 0.4 release notes

- *What’s new*
- *Backwards-incompatible changes*
- *Deprecated features*

### What’s new

#### Private Pages

Wagtail now supports password protecting pages on the frontend, allowing sections of your website to be made private.

*Private pages*

#### Python 3 support

Wagtail now supports Python 3.2, 3.3 and 3.4.

### Scheduled publishing

Editors can now schedule pages to be published or unpublished at specified times.

A new management command has been added (`publish_scheduled_pages`) to publish pages that have been scheduled by an editor.

### Search on QuerySet with Elasticsearch

It's now possible to perform searches with Elasticsearch on `PageQuerySet` objects:

```
>>> from wagtail.wagtailcore.models import Page
>>> Page.objects.live().descendant_of(events_index).search("Hello")
[<Page: Event 1>, <Page: Event 2>]
```

### Sitemap generation

A new module has been added (`wagtail.contrib.wagtailsitemaps`) which produces XML sitemaps for Wagtail sites.

*Sitemap generator*

### Front-end cache invalidation

A new module has been added (`wagtail.contrib.wagtailfrontendcache`) which invalidates pages in a frontend cache when they are updated or deleted in Wagtail.

*Frontend cache invalidator*

### Notification preferences

Users can now decide which notifications they receive from Wagtail using a new “Notification preferences” section located in the account settings.

### Minor features

#### Core

- Any extra arguments given to `Page.serve` are now passed through to `get_context` and `get_template`
- Added `in_menu` and `not_in_menu` methods to `PageQuerySet`
- Added `search` method to `PageQuerySet`
- Added `get_next_siblings` and `get_prev_siblings` to `Page`
- Added `page_published` signal
- Added `copy` method to `Page` to allow copying of pages
- Added `construct_whitelister_element_rules` hook for customising the HTML whitelist used when saving `RichText` fields
- Support for setting a `subpage_types` property on `Page` models, to define which page types are allowed as subpages

## Admin

- Removed the “More” section from the menu
- Added pagination to page listings
- Added a new datetime picker widget
- Updated `hallo.js` to version 1.0.4
- Aesthetic improvements to preview experience
- Login screen redirects to dashboard if user is already logged in
- Snippets are now ordered alphabetically
- Added `init_new_page` signal

## Search

- Added a new way to configure searchable/filterable fields on models
- Added `get_indexed_objects` allowing developers to customise which objects get added to the search index
- Major refactor of Elasticsearch backend
- Use `match` instead of `query_string` queries
- Fields are now indexed in Elasticsearch with their correct type
- Filter fields are no longer included in `_all`
- Fields with partial matching are now indexed together into `_partials`

## Images

- Added `original` as a resizing rule supported by the `{% image %}` tag
- `image` tag now accepts extra keyword arguments to be output as attributes on the `img` tag
- Added an `attrs` property to image rendition objects to output `src`, `width`, `height` and `alt` attributes all in one go

## Other

- Added styleguide, for Wagtail developers

## Bug fixes

- Animated GIFs are now coalesced before resizing
- The Wand backend clones images before modifying them
- The admin breadcrumb is now positioned correctly on mobile
- The page chooser breadcrumb now updates the chooser modal instead of linking to Explorer
- Embeds - fixed crash when no HTML field is sent back from the embed provider
- Multiple sites with same hostname but different ports are now allowed
- It is no longer possible to create multiple sites with `is_default_site = True`

## Backwards-incompatible changes

### ElasticUtils replaced with elasticsearch-py

If you are using the elasticsearch backend, you must install the `elasticsearch` module into your environment.

---

**Note:** If you are using an older version of Elasticsearch (< 1.0) you must install `elasticsearch` version 0.4.x.

---

### Addition of `expired` column may break old data migrations involving pages

The scheduled publishing mechanism adds an `expired` field to `wagtailcore.Page`, defaulting to False. Any application code working with Page objects should be unaffected, but any code that creates page records using direct SQL, or within existing South migrations using South's frozen ORM, will fail as this code will be unaware of the `expired` database column. To fix a South migration that fails in this way, add the following line to the '`wagtailcore.page`' entry at the bottom of the migration file:

```
'expired': ('django.db.models.fields.BooleanField', [], {'default': 'False'}),
```

## Deprecated features

### Template tag libraries renamed

The following template tag libraries have been renamed:

- `pageurl` => `wagtailcore_tags`
- `rich_text` => `wagtailcore_tags`
- `embed_filters` => `wagtailembeds_tags`
- `image_tags` => `wagtailyimages_tags`

The old names will continue to work, but output a `DeprecationWarning` - you are advised to update any `{% load %}` tags in your templates to refer to the new names.

### New search field configuration format

`indexed_fields` is now deprecated and has been replaced by a new search field configuration format called `search_fields`. See [Indexing](#) for how to define a `search_fields` property on your models.

### `Page.route` method should now return a `RouteResult`

Previously, the `route` method called `serve` and returned an `HttpResponse` object. This has now been split up so `serve` is called separately and `route` must now return a `RouteResult` object.

If you are overriding `Page.route` on any of your page models, you will need to update the method to return a `RouteResult` object. The old method of returning an `HttpResponse` will continue to work, but this will throw a `DeprecationWarning` and bypass the `before_serve_page` hook, which means in particular that [Private pages](#) will not work on those page types. See [Adding Endpoints with Custom route\(\) Methods](#).

**Wagtailadmins hooks module has moved to wagtailcore**

If you use any `wagtail_hooks.py` files in your project, you may have an import like: `from wagtail.wagtailadmin import hooks`

Change this to: `from wagtail.wagtailcore import hooks`

**Miscellaneous**

- `Page.show_as_mode` replaced with `Page.serve_preview`
- `Page.get_page_modes` method replaced with `Page.preview_modes` property
- `Page.get_other_siblings` replaced with `Page.get_siblings(inclusive=False)`



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