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# **django-security Documentation**

*Release 1.0*

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**Aug 30, 2019**



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# CHAPTER 1

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## Security models

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`security.views.csp_report` (\*args, \*\*kwargs)

Collect Content Security Policy reports from browsers. This view has two optional keyword arguments:

**csp\_save** if True, reports will be saved as **CspReport** objects in database; this table is registered with Django Admin, so they can be later viewed in admin console.

**csp\_log** if True, reports will be logged through Django logging facility under `security` class

By default only logging is enabled. To collect reports, this view needs to be added to project's `urls.py`. Examples:

Default mode, only logger enable, no database logging:

```
url(r'^csp-report/$', security.views.csp_report),
```

Logger and database enabled:

```
url(r'^csp-report/$', security.views.csp_report,  
    kwargs={'csp_save':True, 'csp_log':True}),
```

`security.views.require_ajax` (view)

A view decorator which ensures that the request being processed by view is an AJAX request. We return a 403 error if the request is not an AJAX request.



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## Security middleware

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**class** `security.middleware.BaseMiddleware` (*get\_response=None*)

Abstract class containing some functionality common to all middleware that require configuration.

**load\_setting** (*setting, value*)

Called initially for each of the keys in `REQUIRED_SETTINGS` and `OPTIONAL_SETTINGS`, and again whenever any of these settings change (from the `setting_changed` signal). Passed the setting key and the new value, which may be `None` for the keys in `OPTIONAL_SETTINGS`. If no setting keys are defined then this method is never called.

**class** `security.middleware.ClearSiteDataMiddleware` (*get\_response=None*)

Sends `Clear-Site-Data` HTTP response header on requests that match `CLEAR_SITE_DATA_URL_WHITELIST`.

Clears browsing data (cookies, storage, cache) associated with the requesting website. Allows web developers to have more control over the data stored locally by a browser for their origins.

Reference:

- Clear-Site-Data: “cache”, “cookies”, “storage”, “executionContexts”, “\*” <<https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/Clear-Site-Data>>‘\_

**load\_setting** (*setting, value*)

Called initially for each of the keys in `REQUIRED_SETTINGS` and `OPTIONAL_SETTINGS`, and again whenever any of these settings change (from the `setting_changed` signal). Passed the setting key and the new value, which may be `None` for the keys in `OPTIONAL_SETTINGS`. If no setting keys are defined then this method is never called.

**process\_response** (*request, response*)

Add `Clear-Site-Data` response header if request in `CLEAR_SITE_DATA_URLS`.

**class** `security.middleware.ContentNoSniff` (*get\_response=None*)

Sends `X-Content-Options` HTTP header to disable autodetection of MIME type of files returned by the server in Microsoft Internet Explorer. Specifically if this flag is enabled, MSIE will not load external CSS and JavaScript files unless server correctly declares their MIME type. This mitigates attacks where web page would for example load a script that was disguised as an user-supplied image.

**Note:** As of 1.8, Django's `SECURE_CONTENT_TYPE_NOSNIFF` controls the X-Content-Type-Options header.

Reference:

- [MIME-Handling Change: X-Content-Type-Options: nosniff](#)

**process\_response** (*request, response*)

Add X-Content-Options: nosniff to the response header.

**class** `security.middleware.ContentSecurityPolicyMiddleware` (*get\_response=None*)

Adds Content Security Policy (CSP) header to HTTP response. CSP provides fine grained instructions to the browser on location of allowed resources loaded by the page, thus mitigating attacks based on loading of untrusted JavaScript code such as Cross-Site Scripting.

The policy can be set in two modes, controlled by `CSP_MODE` options:

**CSP\_MODE='enforce'** browser will enforce policy settings and log violations (*default*)

**CSP\_MODE='report-only'** browser will not enforce policy, only report violations

The policy itself is a dictionary of content type keys and values containing list of allowed locations. For example, `img-src` specifies locations of images allowed to be loaded by this page:

```
'img-src' : [ 'img.example.com' ]
```

Content types and special location types (such as `none` or `self`) are defined in CSP draft (see [References](#)).

Example of policy dictionary (suitable for long, complex policies), with all supported content types (but not listing all supported locations):

```
CSP_DICT = {
    # arrays of allowed locations
    "default-src" : ["self", "https:" ],
    "script-src" : ["self", "http://js.example.com" ],
    "style-src" : ["self", "http://css.example.com" ],
    "img-src" : ["self", "https://img.example.com" ],
    "connect-src" : ["self" ],
    "font-src" : ["https://*.example.com" ],
    "object-src" : ["none" ],
    "media-src" : ["http://media.example.com" ],
    "frame-src" : ["self" ],

    # array of allowed sandbox features
    "sandbox" : [ "" ],

    # array of allowed MIME types
    "plugin-types" : [ "application/pdf" ],

    # these are not arrays
    "reflected-xss" : 'filter',
    "report-uri" : "http://example.com/csp-report",
}
```

You can also supply a raw policy string, which is more suitable for short policies:

```
CSP_STRING="default-src 'self'; script-src *.google.com"
```

If both `CSP_DICT` and `CSP_STRING` are set the middleware will throw an exception.

**Notes:**

- The special locations ('self', 'none', 'unsafe-eval', 'unsafe-inline') come **without** the additional single quotes in `CSP_DICT` and they will be automatically quoted by the middleware in the HTTP header.
- The `CSP_STRING` on the other hand should be a verbatim copy of the HTTP header contents. It's not going to be processed in any way.
- This middleware only sets the standard HTTP header variants (`Content-Security-Policy`). The experimental ones (`X-WebKit-CSP` and `Content-Security-Policy`) are now obsolete.
- Enabling CSP has significant impact on browser behaviour - for example inline JavaScript is disabled. Read [Default Policy Restrictions](#) to see how pages need to be adapted to work under CSP.
- Browsers will log CSP violations in JavaScript console and to a remote server configured by `report-uri` option. This package provides a view (`csp_report`) to collect these alerts in your application. They can be then viewed using Django admin interface. For more advanced analytics try [CspBuilder](#).
- The middleware partially supports CSP 1.1 draft syntax.

#### References:

- [Content Security Policy Level 2](#),
- [HTML5.1 - Sandboxing](#)

#### `process_response` (*request, response*)

Add Content Security Policy policy to the response header. Use either enforcement or report-only headers in all currently used variants.

#### `class security.middleware.CustomLogoutMixin`

If the `CUSTOM_LOGOUT_MODULE` is set in Django config, import and use that when performing a logout.

#### `class security.middleware.DoNotTrackMiddleware` (*get\_response=None*)

When this middleware is installed Django views can access a new `request.dnt` parameter to check client's preference on user tracking as expressed by their browser configuration settings.

The parameter can take True, False or None values based on the presence of the Do Not Track HTTP header in client's request, which in turn depends on browser's configuration. The header indicates client's general preference to opt-out from behavioral profiling and third-party tracking.

The parameter does **not** change behaviour of Django in any way as its sole purpose is to pass the user's preference to application. It's then up to the owner to implement a particular policy based on this information. Compliant website should adapt its behaviour depending on one of user's preferences:

- Explicit opt-out (`request.dnt` is True): Disable third party tracking for this request and delete all previously stored tracking data.
- Explicit opt-in (`request.dnt` is False): Website may track user.
- Header not present (`request.dnt` is None): Website may track user, but should not draw any definite conclusions on user's preferences as the user has not expressed it.

For example, if `request.dnt` is " True" the website might respond by disabling template parts responsible for personalized statistics, targeted advertisements or switching to DNT aware ones.

#### Examples:

- [Do Not Track \(DNT\) tutorial for Django](#)
- [Do Not Track - Web Application Templates](#)
- [Opt-out of tailoring Twitter](#)

#### References:

- [Web Tracking Protection](#)

- Do Not Track: A Universal Third-Party Web Tracking Opt Out

**process\_request** (*request*)

Read DNT header from browser request and create request attribute

**process\_response** (*request, response*)

Echo DNT header in response per section 8.4 of draft-mayer-do-not-track-00

**class** `security.middleware.LoginRequiredMiddleware` (*get\_response=None*)

Middleware that requires a user to be authenticated to view any page on the site that hasn't been white listed. (The middleware also ensures the user is 'active'. Disabled users will be logged out and redirected to the login page.

Exemptions to this requirement can optionally be specified in settings via a list of regular expressions in `LOGIN_EXEMPT_URLS` (which you can copy from your `urls.py`).

Requires authentication middleware and template context processors to be loaded. You'll get an error if they aren't.

By default this middleware will call the builtin Django logout function to perform the logout. You can customize which logout function will be called by specifying it in your django settings using the `CUSTOM_LOGOUT_MODULE` variable. The value should be the module path to the function, e.g. 'django.contrib.auth.logout'.

**load\_setting** (*setting, value*)

Called initially for each of the keys in `REQUIRED_SETTINGS` and `OPTIONAL_SETTINGS`, and again whenever any of these settings change (from the `setting_changed` signal). Passed the setting key and the new value, which may be None for the keys in `OPTIONAL_SETTINGS`. If no setting keys are defined then this method is never called.

**class** `security.middleware.MandatoryPasswordChangeMiddleware` (*get\_response=None*)

Redirects any request from an authenticated user to the password change form if that user's password has expired. Must be placed after `AuthenticationMiddleware` in the middleware list.

Configured by dictionary `MANDATORY_PASSWORD_CHANGE` with the following keys:

`URL_NAME` name of the password change view

`EXEMPT_URL_NAMES` list of URLs that do not trigger password change request

`INCLUDE_SUPERUSERS` also check superusers for password change, default False

**load\_setting** (*setting, value*)

Called initially for each of the keys in `REQUIRED_SETTINGS` and `OPTIONAL_SETTINGS`, and again whenever any of these settings change (from the `setting_changed` signal). Passed the setting key and the new value, which may be None for the keys in `OPTIONAL_SETTINGS`. If no setting keys are defined then this method is never called.

**class** `security.middleware.NoConfidentialCachingMiddleware` (*get\_response=None*)

Adds No-Cache and No-Store headers to confidential pages. You can either whitelist non-confidential pages and treat all others as non-confidential, or specifically blacklist pages as confidential. The behaviour is configured in `NO_CONFIDENTIAL_CACHING` dictionary in settings file with the following keys:

**WHITELIST\_ON all pages are confidential, except for pages** explicitly whitelisted in `WHITELIST_REGEXES`

**WHITELIST\_REGEXES** list of regular expressions defining pages exempt from the no caching policy

**BLACKLIST\_ON only pages defined in BLACKLIST\_REGEXES** will have caching disabled

**BLACKLIST\_REGEXES** list of regular expressions defining confidential pages for which caching should be prohibited

**Note:** Django's `cache_control` decorator allows more granular control of caching on individual view level.

Reference:

- [HTTP/1.1 Header definitions - What is Cacheable](#)

**load\_setting** (*setting, value*)

Called initially for each of the keys in `REQUIRED_SETTINGS` and `OPTIONAL_SETTINGS`, and again whenever any of these settings change (from the `setting_changed` signal). Passed the setting key and the new value, which may be `None` for the keys in `OPTIONAL_SETTINGS`. If no setting keys are defined then this method is never called.

**process\_response** (*request, response*)

Add the Cache control no-store to anything confidential. You can either whitelist non-confidential pages and treat all others as non- confidential, or specifically blacklist pages as confidential

**class** `security.middleware.P3PPolicyMiddleware` (*get\_response=None*)

Adds the HTTP header attribute specifying compact P3P policy defined in `P3P_COMPACT_POLICY` setting and location of full policy defined in `P3P_POLICY_URL`. If the latter is not defined, a default value is used (`/w3c/p3p.xml`). The policy file needs to be created by website owner.

**Note:** P3P work stopped in 2002 and the only popular browser with **limited** P3P support is MSIE.

Reference:

- [The Platform for Privacy Preferences 1.0 \(P3P1.0\) Specification - The Compact Policies](#)

**load\_setting** (*setting, value*)

Called initially for each of the keys in `REQUIRED_SETTINGS` and `OPTIONAL_SETTINGS`, and again whenever any of these settings change (from the `setting_changed` signal). Passed the setting key and the new value, which may be `None` for the keys in `OPTIONAL_SETTINGS`. If no setting keys are defined then this method is never called.

**process\_response** (*request, response*)

Add P3P policy to the response header.

**class** `security.middleware.SessionExpiryPolicyMiddleware` (*get\_response=None*)

The session expiry middleware will let you expire sessions on browser close, and on expiry times stored in the cookie itself. (Expiring a cookie on browser close means you don't set the expiry value of the cookie.) The middleware will read `SESSION_COOKIE_AGE` and `SESSION_INACTIVITY_TIMEOUT` from the `settings.py` file to determine how long to keep a session alive.

We will purge a session that has expired. This middleware should be run before the `LoginRequired` middleware if you want to redirect the expired session to the login page (if required).

Exemptions to this requirement can optionally be specified in settings via a list of regular expressions in `SESSION_EXPIRY_EXEMPT_URLS` (which you can copy from your `urls.py`).

By default this middleware will call the builtin Django logout function to perform the logout. You can customize which logout function will be called by specifying it in your django settings using the `CUSTOM_LOGOUT_MODULE` variable. The value should be the module path to the function, e.g. `'django.contrib.auth.logout'`.

**load\_setting** (*setting, value*)

Called initially for each of the keys in `REQUIRED_SETTINGS` and `OPTIONAL_SETTINGS`, and again whenever any of these settings change (from the `setting_changed` signal). Passed the setting key and the new value, which may be `None` for the keys in `OPTIONAL_SETTINGS`. If no setting keys are defined then this method is never called.

**process\_request** (*request*)

Verify that the session should be considered active. We check the start time and the last activity time to determine if this is the case. We set the last activity time to `now()` if the session is still active.

**class** `security.middleware.StrictTransportSecurityMiddleware` (*get\_response=None*)

Adds Strict-Transport-Security header to HTTP response that enforces SSL connections on compliant browsers. Two parameters can be set in settings file, otherwise reasonable defaults will be used:

- `STS_MAX_AGE` time in seconds to preserve host's STS policy (default: 1 year)
- `STS_INCLUDE_SUBDOMAINS` True if subdomains should be covered by the policy as well (default: True)
- `STS_PRELOAD` add `preload` flag to the STS header so that your website can be added to preloaded websites list

**Note:** As of 1.8, Django's `SECURE_HSTS_SECONDS` controls the HTTP Strict Transport Security header.

Reference:

- [HTTP Strict Transport Security \(HSTS\)](https://datatracker.ietf.org/doc/rfc6797/)  
<<https://datatracker.ietf.org/doc/rfc6797/>>\_
- [Preloaded HSTS sites](#)

**process\_response** (*request, response*)  
Add Strict-Transport-Security header.

`security.middleware.XFrameOptionsDenyMiddleware`  
alias of `security.middleware.XFrameOptionsMiddleware`

**class** `security.middleware.XFrameOptionsMiddleware` (*get\_response=None*)

Emits X-Frame-Options headers in HTTP response. These headers will instruct the browser to limit ability of this web page to be framed, or displayed within a FRAME or IFRAME tag. This mitigates password stealing attacks like Clickjacking and similar.

Use `X_FRAME_OPTIONS` in settings file with the following values:

- `deny` prohibit any framing of this page
- `sameorigin` allow frames from the same domain (*default*)
- `allow-from` URL allow frames from specified *URL*

**Note:** Frames and inline frames are frequently used by ads, social media plugins and similar widgets so test these features after setting this flag.

You can exclude certain URLs from this header by setting `X_FRAME_OPTIONS_EXCLUDE_URLS` to a list of URL regexes like so:

```
X_FRAME_OPTIONS_EXCLUDE_URLS = (  
    r'^/some/url/here$',          # Note the initial slash  
    r'^/another/to/exclude$',  
)
```

The header will be sent unless `request.path` matches any of the above list. For more granular control, use `ContentSecurityPolicyMiddleware`.

References:

- [RFC 7034: HTTP Header Field X-Frame-Options](#)

**load\_setting** (*setting, value*)

Called initially for each of the keys in `REQUIRED_SETTINGS` and `OPTIONAL_SETTINGS`, and again whenever any of these settings change (from the `setting_changed` signal). Passed the setting key and the



new value, which may be None for the keys in OPTIONAL\_SETTINGS. If no setting keys are defined then this method is never called.

**process\_response** (*request, response*)

Add X-Frame-Options and Frame-Options to the response header.

**class** `security.middleware.XssProtectMiddleware` (*get\_response=None*)

Sends X-XSS-Protection HTTP header that controls Cross-Site Scripting filter on MSIE. Use XSS\_PROTECT option in settings file with the following values:

`sanitize` enable XSS filter that tries to sanitize requests instead of blocking (*default*)

`on` enable full XSS filter blocking XSS requests (may [leak document.referrer](#))

`off` completely disable XSS filter

**Note:** As of 1.8, Django's `SECURE_BROWSER_XSS_FILTER` controls the X-XSS-Protection header.

Reference:

- [Controlling the XSS Filter](#)

**load\_setting** (*setting, value*)

Called initially for each of the keys in REQUIRED\_SETTINGS and OPTIONAL\_SETTINGS, and again whenever any of these settings change (from the `setting_changed` signal). Passed the setting key and the new value, which may be None for the keys in OPTIONAL\_SETTINGS. If no setting keys are defined then this method is never called.

**process\_response** (*request, response*)

Add X-XSS-Protection to the response header.



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