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# **Tornadose Documentation**

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An implementation of the publish/subscribe pattern for the [Tornado](#) web server.



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## Usage

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A simple example of using server-sent events (a.k.a. EventSource):

```
import random
from tornado.ioloop import IOLoop, PeriodicCallback
from tornado.web import Application
from tornadose.handlers import EventSource
from tornadose.stores import DataStore

store = DataStore()

app = Application(
    [(r'/', EventSource, {'store': store})],
    debug=True)
app.listen(9000)

loop = IOLoop.instance()
PeriodicCallback(lambda: store.set_data(random.random()), 1000).start()
loop.start()
```

To monitor the stream with `curl`:

```
$ curl http://localhost:9000
```

or with `HTTPIe`:

```
$ http -S get localhost:9000
```

Additional demos can be found in the `demos` directory.





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### See also

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Some other implementations of server-sent events with Tornado include:

- [tornado-sse](#)
- [tornado-eventsource](#)



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### License

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Tornadose is freely available under the terms of the MIT license. See `LICENSE` for details. The source code can be found on [GitHub](#).



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## Contents

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### 4.1 Data storage and publishing

In order to publish data to listeners, Tornadoose utilizes a data store concept somewhat reminiscent of that used in [Flux](#). In short, subscribers start listening to a data store and are notified when there are updates.

**class** `tornadoose.stores.BaseStore (*args, **kwargs)`

Base class for all data store types.

At a minimum, derived classes should implement `submit` and `publish` methods.

**deregister** (*subscriber*)

Stop publishing to a subscriber.

**initialize** (*\*args, \*\*kwargs*)

Hook for doing custom initialization. Child classes should implement this method instead of overwriting `__init__`.

**publish** ()

Push messages to all listeners. This method must be implemented by child classes. A recommended way to implement this method is as a looping coroutine which yields until new data is available via the `submit ()` method.

**register** (*subscriber*)

Register a new subscriber. This method should be invoked by listeners to start receiving messages.

**submit** (*message*)

Add a new message to be pushed to subscribers. This method must be implemented by child classes.

This method exists to store new data. To actually publish the data, implement the `publish` method.

**class** `tornadoose.stores.DataStore (*args, **kwargs)`

Generic object for producing data to feed to clients.

To use this, simply instantiate and update the `data` property whenever new data is available. When creating a new `EventSource` handler, specify the `DataStore` instance so that the `EventSource` can listen for updates.

**class** `tornadoose.stores.QueueStore (*args, **kwargs)`

Publish data via queues.

This class is meant to be used in cases where subscribers should not miss any data. Compared to the `DataStore` class, new messages to be broadcast to clients are put in a queue to be processed in order.

`QueueStore` will work with any `tornado.web.RequestHandler` subclasses which implement a `submit` method. It is recommended that a custom subscription handler's `submit ()` method also utilize a

queue to avoid losing data. The subscriber must also register/deregister itself with the `QueueStore` via the `QueueStore.register()` and `QueueStore.deregister()` methods.

A `QueueStore`-compatible request handler is included in `tornadoose.handlers.WebSocketSubscriber`.

## 4.2 Request handlers

**class** `tornadoose.handlers.BaseHandler` (*application, request, \*\*kwargs*)  
Bases: `tornado.web.RequestHandler`

Base handler for subscribers. To be compatible with data stores defined in `tornadoose.stores`, custom handlers should inherit this class and implement the `submit()` and `publish()` methods.

**class** `tornadoose.handlers.EventSource` (*application, request, \*\*kwargs*)  
Bases: `tornadoose.handlers.BaseHandler`

Handler for server-sent events a.k.a. EventSource.

The `EventSource` interface has a few advantages over websockets:

- It is a normal HTTP connection and so can be more easily monitored than websockets using tools like `curl` or `HTTPie`.
- Browsers generally automatically try to reestablish a lost connection.
- The publish/subscribe pattern is better suited to some applications than the full duplex model of websockets.

**initialize** (*store, period=None*)

If `period` is given, publishers will sleep for approximately the given time in order to throttle data speeds.

**publish** (*\*args, \*\*kwargs*)  
Pushes data to a listener.

**class** `tornadoose.handlers.WebSocketSubscriber` (*application, request, \*\*kwargs*)  
Bases: `tornadoose.handlers.BaseHandler`, `tornado.websocket.WebSocketHandler`

A Websocket-based subscription handler to be used with `tornadoose.stores.QueueStore`.

**open** (*\*args, \*\*kwargs*)  
Register with the publisher.

**publish** (*\*args, \*\*kwargs*)  
Push a new message to the client. The data will be available as a JSON object with the key `data`.

## 4.3 Changelog

### 4.3.1 Version 0.2.0

2015-10-11

- Reworks stores and handlers (backwards incompatible!).
- Adds a new queue-based `QueueStore` store.
- Implements a websocket-based subscriber to supplement `EventSource`.
- Begins to add unit testing.

### 4.3.2 Version 0.1.2

2015-09-20

- Defines an `EventSource` request handler and a `DataStore` object for using server-sent events with Tornado.





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