

# Extending

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\ (cpython-main) (Doc) (library) asyncio-extending.rst, line 1)**

Unknown directive type "currentmodule".

```
.. currentmodule:: asyncio
```

The main direction for `:mod:`asyncio`` extending is writing custom *event loop* classes. Asyncio has helpers that could be used to simplify this task.

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## Note

Third-parties should reuse existing asyncio code with caution, a new Python version is free to break backward compatibility in *internal* part of API.

## Writing a Custom Event Loop

`:class:`asyncio.AbstractEventLoop`` declares very many methods. Implementing all them from scratch is a tedious job.

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A loop can get many common methods implementation for free by inheriting from `:class:`asyncio.BaseEventLoop``.

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In turn, the successor should implement a bunch of *private* methods declared but not implemented in `:class:`asyncio.BaseEventLoop``.

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For example, `loop.create_connection()` checks arguments, resolves DNS addresses, and calls `loop._make_socket_transport()` that should be implemented by inherited class. The `_make_socket_transport()` method is not documented and is considered as an *internal* API.

## Future and Task private constructors

`:class:`asyncio.Future`` and `:class:`asyncio.Task`` should be never created directly, please use corresponding `:meth:`loop.create_future`` and `:meth:`loop.create_task``, or `:func:`asyncio.create_task`` factories instead.

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However, third-party *event loops* may *reuse* built-in future and task implementations for the sake of getting a complex and highly optimized code for free.

For this purpose the following *private* constructors are listed:

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```
.. method:: Future.__init__(*, loop=None)

    Create a built-in future instance.

    *loop* is an optional event loop instance.
```

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Unknown directive type "method".

```
.. method:: Task.__init__(coro, *, loop=None, name=None, context=None)

    Create a built-in task instance.

    *loop* is an optional event loop instance. The rest of arguments are described in
    :meth:`loop.create_task` description.

.. versionchanged:: 3.11

    *context* argument is added.
```

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```
.. method:: Tasl._check_future(future)

    Return ``True`` if *future* is attached to the same loop as the task, ``False``
    otherwise.

.. versionadded:: 3.11
```

## Task lifetime support

A third party task implementation should call the following functions to keep a task visible by :func:`asyncio.get\_tasks` and :func:`asyncio.current\_task`:

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```
.. function:: _register_task(task)

    Register a new *task* as managed by *asyncio*.

    Call the function from a task constructor.
```

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```
.. function:: _unregister_task(task)

    Unregister a *task* from *asyncio* internal structures.

    The function should be called when a task is about to finish.
```

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```
.. function:: _enter_task(loop, task)

    Switch the current task to the *task* argument.

    Call the function just before executing a portion of embedded *coroutine*
    (:meth:`coroutine.send` or :meth:`coroutine.throw`).
```

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```
.. function:: _leave_task(loop, task)

    Switch the current task back from *task* to ``None``.

    Call the function just after :meth:`coroutine.send` or :meth:`coroutine.throw`
    execution.
```