

# :mod:`asyncio` --- Asynchronous I/O

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```
.. module:: asyncio
   :synopsis: Asynchronous I/O.
```

asyncio is a library to write **concurrent** code using the **async/await** syntax.

asyncio is used as a foundation for multiple Python asynchronous frameworks that provide high-performance network and web-servers, database connection libraries, distributed task queues, etc.

asyncio is often a perfect fit for IO-bound and high-level **structured** network code.

asyncio provides a set of **high-level** APIs to:

- [ref`run Python coroutines <coroutine>`](#) concurrently and have full control over their execution;

## Hello World!

```
import asyncio

async def main():
    print('Hello ...')
    await asyncio.sleep(1)
    print('... World!')

# Python 3.7+
asyncio.run(main())
```

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- perform [ref`network IO and IPC <asyncio-streams>`](#);

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- control [ref`subprocesses <asyncio-subprocess>`](#);

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- distribute tasks via [ref`queues <asyncio-queues>`](#);

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- [ref`synchronize <asyncio-sync>`](#) concurrent code;

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Additionally, there are **low-level** APIs for *library and framework developers* to:

- create and manage `ref`event loops <asyncio-event-loop>`, which provide asynchronous APIs for `meth`networking <loop.create_server>`, running `meth`subprocesses <loop.subprocess_exec>`, handling `meth`OS signals <loop.add_signal_handler>`, etc;

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- implement efficient protocols using `ref`transports <asyncio-transports-protocols>`;

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- `ref`bridge <asyncio-futures>` callback-based libraries and code with `async/await` syntax.

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## Reference

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```
.. toctree::
    :caption: High-level APIs
    :maxdepth: 1

    asyncio-runner.rst
    asyncio-task.rst
    asyncio-stream.rst
    asyncio-sync.rst
    asyncio-subprocess.rst
    asyncio-queue.rst
    asyncio-exceptions.rst
```

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```
.. toctree::
  :caption: Low-level APIs
  :maxdepth: 1

  asyncio-eventloop.rst
  asyncio-future.rst
  asyncio-protocol.rst
  asyncio-policy.rst
  asyncio-platforms.rst
  asyncio-extending.rst
```

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```
.. toctree::
  :caption: Guides and Tutorials
  :maxdepth: 1

  asyncio-api-index.rst
  asyncio-llapi-index.rst
  asyncio-dev.rst
```

#### Note

The source code for asyncio can be found in `:source:`Lib/asyncio/``.

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