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- [\[Basic\]](#) Promise
- [\[Doc\]](#) Events ()
- [\[Doc\]](#) Timers ()
- [\[Point\]](#) /
- [\[Point\]](#) /

promise

```
| promise |
```

- ECMAScript 6 - Promise
- JavaScript - Promise

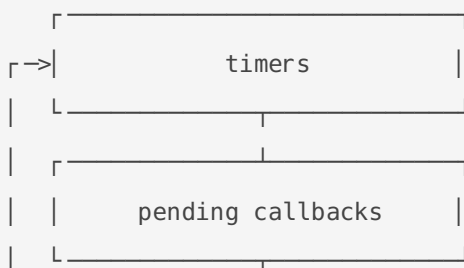
Event Loop

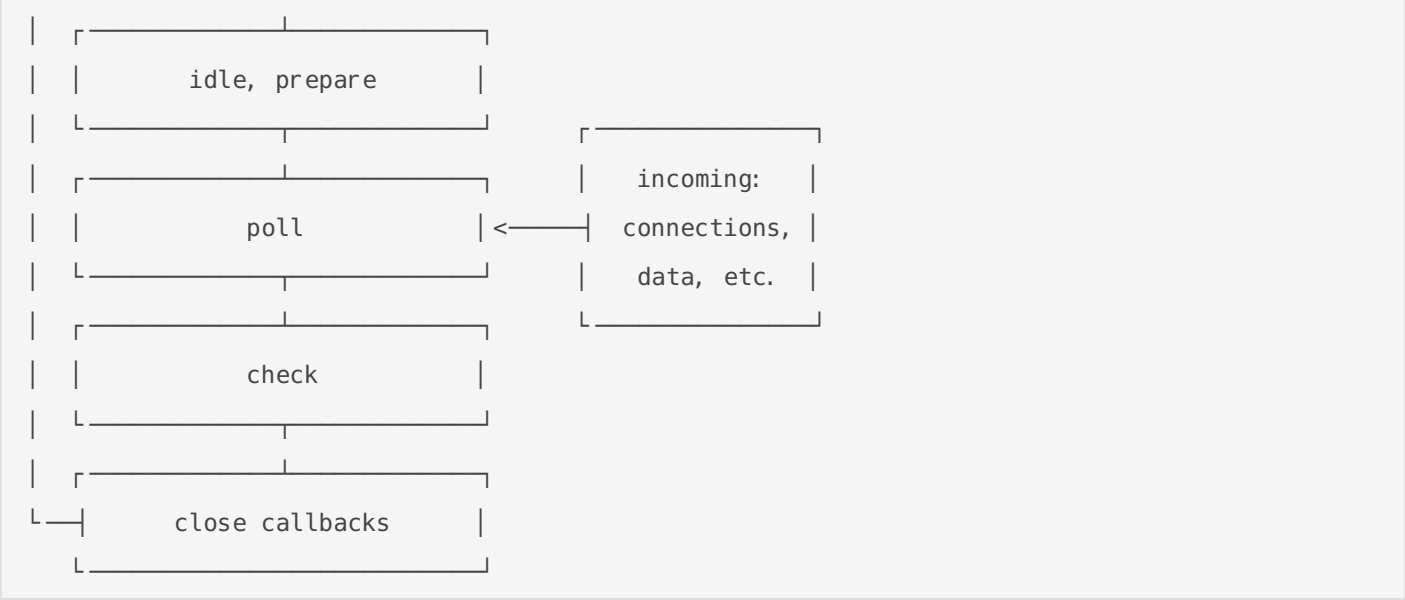
Event loop | Node | Event loop | Event loop

Node libuv

“ <https://nodejs.org/en/docs/guides/event-loop-timers-and-nexttick/>
<https://nodejs.org/zh-cn/docs/guides/event-loop-timers-and-nexttick/>

Event loop





node



1 timers

```
setTimeout() || setInterval()
```

2 I/O callbacks

- setTimeout() setInterval()
- setImmediate()
- socket.on('close', ...)

3 idle, prepare

libuv

4 Poll

I/O

I/O

5 check

```
setImmediate()
```

6 close callbacks

```
socket.on('close', ...)
```

`process.nextTick()`

event loop `process.nextTick()`

nextTickQueue nextTickQueue

“

<http://www.ruanyifeng.com/blog/2018/02/node-event-loop.html>

<https://github.com/creeperyang/blog/issues/26>

Macrotask Microtask

Microtask

1. `process.nextTick`
2. promises
3. `Object.observe()` (API)
4. `MutationObserver` (DOM change)

Macrotask

1. `setTimeout`
2. `setInterval`
3. `setImmediate`
4. I/O
5. UI rendering
6. `requestAnimationFrame`

“ WHATWG
microtask

one cycle of the event loop
microtask microtask

(macro)task macrotask

“

<https://github.com/ccforward/cc/issues/47>

timers

`timer`

`require`

API

<http://nodejs.cn/api/timers.html>



Node.js

JavaScript



JavaScript (ES6)

```
const fs = require('fs');  
const data = fs.readFileSync(' /file.md '); //
```



“

<https://nodejs.org/zh-cn/docs/guides/blocking-vs-non-blocking/#>
<https://www.zhihu.com/question/19732473>

(Parallel)

(Concurrent)

Image not found or type unknown

```
( Concurrent ) = 2      1      .  
( Parallel ) = 2      2      .
```

“

“

<https://baike.baidu.com/item/%E5%B9%B6%E5%8F%91#4>
[https://baike.baidu.com/item/%E5%B9%B6%E8%A1%8C/5806759#reference-\[1\]-8050484-wrap](https://baike.baidu.com/item/%E5%B9%B6%E8%A1%8C/5806759#reference-[1]-8050484-wrap) <https://www.zhihu.com/question/33515481>

Cluster

nodejs

cluster

nodejs

```
cluster || cluster.fork() || cluster.fork() || child_process.fork()
```

```
cluster.fork() --> child_process.fork()
```

```
const cluster = require('cluster');
const http = require('http');
const numCPUs = require('os').cpus().length;

if (cluster.isMaster) {
  console.log(`    ${process.pid}    `);

  //
  for (let i = 0; i < numCPUs; i++) {
    cluster.fork();
  }

  cluster.on('exit', (worker, code, signal) => {
    console.log(`    ${worker.process.pid}    `);
  });
} else {
  //      TCP
  //      HTTP
  http.createServer((req, res) => {
    res.writeHead(200);
    res.end('    \n');
  }).listen(8000);

  console.log(`    ${process.pid}    `);
}
```

```
$ node server.js
```

```
3596
4324
4520
6056
5644
```

“ <http://nodejs.cn/api/cluster.html>

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