# Web API
# A Crash Course

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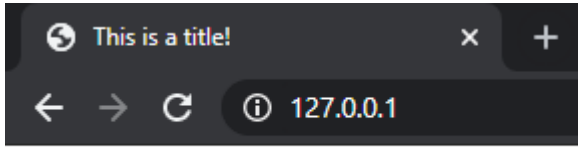
# **H**yper**T**ext **T**ransportation **P**rotocol

- HTTP messages are how data is exchanged between a server and a client. There are two types of messages: *requests* sent by the client to trigger an action on the server, and *responses*, the answer from the server.
- HTTP is an application layer protocol.

https://developer.mozilla.org/en-US/docs/Web/HTTP/Messages

# **H**yper**T**ext **T**ransportation **P**rotocol

Open browser, type in url, enter, and BOOM~




```
>>> import requests
>>> r = requests.get('http://127.0.0.1')
>>> print(r.content.decode())
<!DOCTYPE html>
<html>
  <head>
    <title>This is a title!</title>
  </head>
  <body>
    This is a body!
  </body>
</html>
```

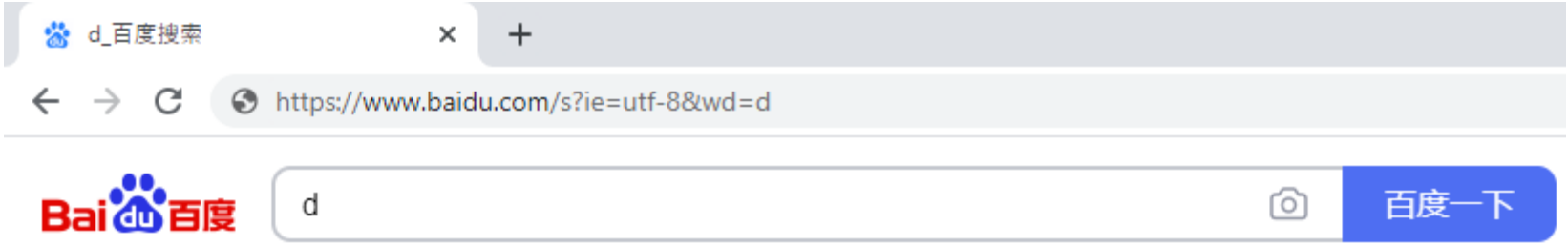
**User**

```
>>> import socket
>>> s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
>>> s.bind(('127.0.0.1', 80))
>>> s.listen(0)
>>> c, a = s.accept()
>>> request = c.recv(1024)
>>> print(request.decode())
GET / HTTP/1.1
Host: 127.0.0.1
User-Agent: python-requests/2.22.0
Accept-Encoding: gzip, deflate
Accept: */*
Connection: keep-alive

                          Two blank lines
>>> response = '''HTTP/1.1 200 OK
... Content-Length: 124
... Content-Type: text/html; charset=UTF-8
...
... <!DOCTYPE html>
... <html>
...   <head>
...     <title>This is a title!</title>
...   </head>
...   <body>
...     This is a body!
...   </body>
... </html>'''
>>> c.send(response.encode())
201
```

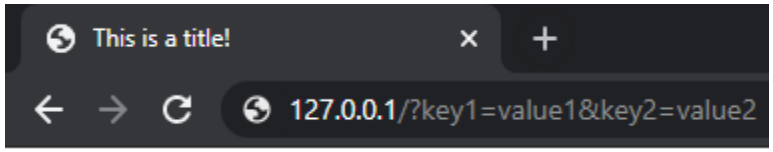
**Server**

# More Complicated Requests




```
requests.get('http://127.0.0.1:12345', params= {'key1': 'value1', 'key2': 'value2'})
```

```
GET /?key1=value1&key2=value2 HTTP/1.1
Host: 127.0.0.1:12345
User-Agent: python-requests/2.22.0
Accept-Encoding: gzip, deflate
Accept: */*
Connection: keep-alive
```




```
requests.post('http://127.0.0.1:12345', data = {'key':'value'}, headers={'User-Agent':'Fool the Server'})
```

```
POST / HTTP/1.1
Host: 127.0.0.1:12345
User-Agent: Fool the Server
Accept-Encoding: gzip, deflate
Accept: */*
Connection: keep-alive
Content-Length: 9
Content-Type: application/x-www-form-urlencoded

key=value
```

# Javascript sends request

```
<html>
<body>
  <script src="https://unpkg.com/vue/dist/vue.min.js"> </script>
  <script src="https://unpkg.com/axios/dist/axios.min.js"></script>
  <div id="aaa">
    <p>Random number: <% randomNumber %></p>
    <button @click="getRandomFromBackend()">New random number</button>
  </div>
  <script>
    new Vue({
      el: '#aaa',
      delimiters: ["<%","%>"],
      data: {
        randomNumber: 'Please Press The Button~'
      },
      methods: {
        getRandomFromBackend () {
          const path = `http://127.0.0.1:5000/api/random`
          axios.get(path)
            .then(response => {
              this.randomNumber = response.data.randomNumber
            })
            .catch(error => {
              console.log(error)
            })
        }
      }
    });
  </script>
</body>
</html>
```

```
const path = `http://127.0.0.1:5000/api/random`
axios.get(path)
```

# Response change DOM

```
<html>
<body>
  <script src="https://unpkg.com/vue/dist/vue.min.js"> </script>
  <script src="https://unpkg.com/axios/dist/axios.min.js"></script>
  <div id="aaa">
    <p>Random number: <% randomNumber %></p>
    <button @click="getRandomFromBackend()">New random number</button>
  </div>
  <script>
    new Vue({
      el: '#aaa',
      delimiters: ["<%","%>"],
      data: {
        randomNumber: 'Please Press The Button~'
      },
      methods: {
        getRandomFromBackend () {
          const path = `http://127.0.0.1:5000/api/random`
          axios.get(path)
            .then(response => {
              this.randomNumber = response.data.randomNumber
            })
            .catch(error => {
              console.log(error)
            })
        }
      }
    });
  </script>
</body>
</html>
```

```
<p>Random number: <% randomNumber %></p>
```

```
this.randomNumber = response.data.randomNumber
```

```
HTTP/1.1 200 OK
Content-Length: 20
Content-type: application/json; charset=UTF-8

{"randomNumber":123}
```