

O'REILLY®

Fundamentals of APIs

The Basics of APIs

July 2023



Basics of APIs

- Protocol
 - HTTP in a Nutshell
- Programming
 - APIs vs. Services
- Connecting
 - Pulling it all together

Basics of APIs : HTTP in a Nutshell

- Messages
 - Request & Response
- Methods
 - GET, POST, PUT, DELETE, and more
- Safety & Idempotence
 - Read-only vs. Repeatable

The Basics of APIs: HTTP in a Nutshell

TK: Replace this w/ live video

```
Terminal - mca@mamund-ws: .../hyper
File Edit View Terminal Tabs Help
> CALL http://activity-production.up.railway.app

STATUS 200
https://activity-production.up.railway.app/
application/json; charset=utf-8
> SHOW
{
  "home": [
    {
      "id": "list",
      "name": "activity",
      "rel": "collection activity",
      "href": "http://activity-production.up.railway.app/list/"
    }
  ]
}
> CALL WITH-PATH $..href

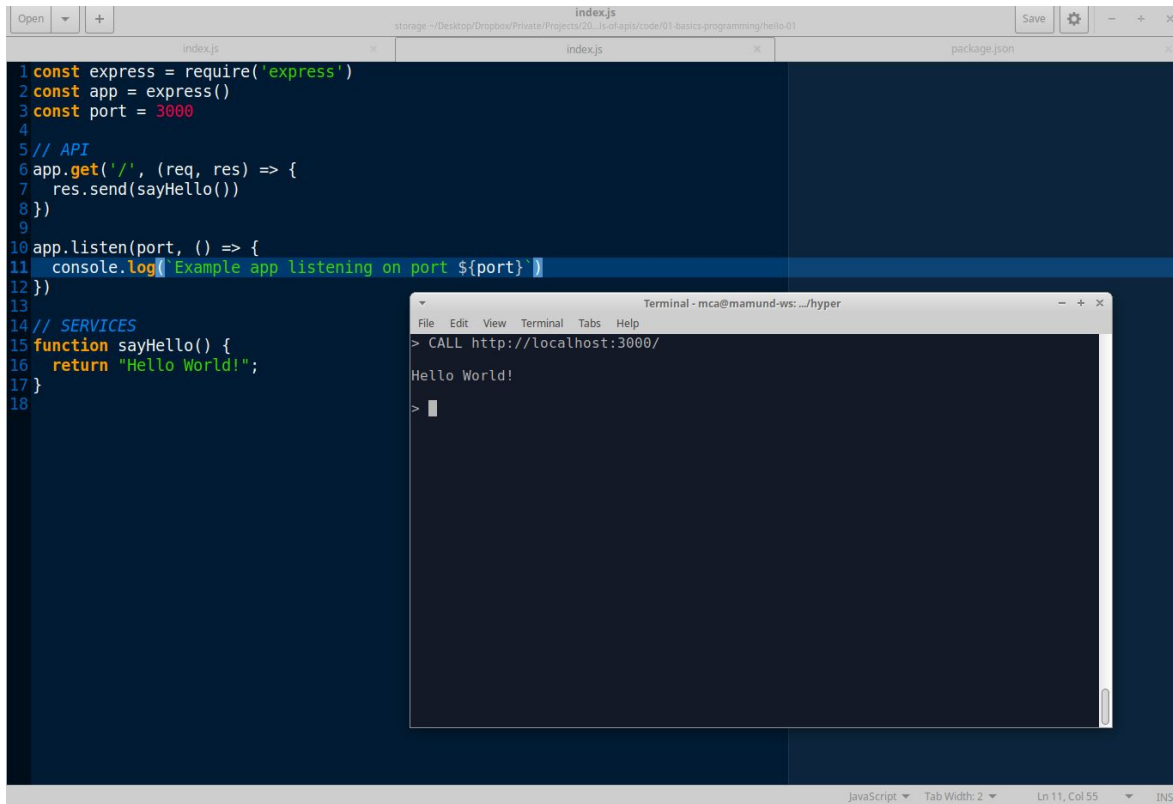
STATUS 200
https://activity-production.up.railway.app/list/
application/json; charset=utf-8
> █
```

The Basics of APIs: APIs vs. Services

- APIs are external
 - APIs expose a set of actions, arguments, and return values
- Services are internal
 - Services process the arguments, do the actions, and compose the return values
- API programming is mixing the external and internal
 - Express JS is a great platform for programming APIs

The Basics of APIs: APIs vs. Services

TK: Replace this w/ live video



The screenshot displays a code editor with a dark theme. The main editor window shows the `index.js` file with the following code:

```
1 const express = require('express')
2 const app = express()
3 const port = 3000
4
5 // API
6 app.get('/', (req, res) => {
7   res.send(sayHello())
8 })
9
10 app.listen(port, () => {
11   console.log(`Example app listening on port ${port}`)
12 })
13
14 // SERVICES
15 function sayHello() {
16   return "Hello World!";
17 }
18
```

A terminal window is open in the foreground, showing the command prompt output:

```
Terminal - mca@mamund-ws: ~/hyper
> CALL http://localhost:3000/
Hello World!
>
```

The status bar at the bottom of the code editor indicates the current file is `index.js`, the language is `JavaScript`, and the cursor is at `Ln 11, Col 55`.

The Basics of APIs: Connecting

- API Clients call API services
 - Consuming APIs is the real action
- Multiple client platforms
 - Browser, command-line apps, dedicated applications
- Clients understand it all
 - Protocol, programming, connecting



The Basics of APIs: Connecting

TK: Replace this w/ live video

Terminal Window:

```
Terminal - mca@mamund-ws: ~/hyper
> CALL http://rwcbook14.up.railway.app/home/

{
  "collection": {
    "version": "1.0",
    "href": "//rwcbook14.up.railway.app/home/",
    "title": "TPS - Task Processing System",
    "content": "<div class='ui segment'><h3>Welcome to TPS at BigCo!</h3></div>",
    "links": [
      {
        "href": "http://rwcbook14.up.railway.app/home/",
        "rel": "self home collection",
        "prompt": "Home"
      },
      {
        "href": "http://rwcbook14.up.railway.app/task/",
        "rel": "task collection",
        "prompt": "Tasks"
      },
      {
        "href": "http://rwcbook14.up.railway.app/user/",
        "rel": "user collection",
        "prompt": "Users"
      },
      {
        "href": "http://rwcbook14.up.railway.app/note/",
        "rel": "collection //rwcbook14.up.railway.app/rels/note",
        "prompt": "Notes"
      }
    ]
  },
  "items": [],
  "queries": [],
  "related": {}
}
```

Web Browser Window:

TPS - Tasks

Manage your TPS Tasks here.

You can do the following:

- Add, Edit and Delete tasks
- Mark tasks "complete", assign tasks to a user
- Filter the list by Title, Assigned User, and Completed Status

Task List:

ID	Title	Tags	Complete Flag	Assigned User
119fz7bhaho	extensions	forms testing	true	alice

Add Task Form:

Title:

Tags:

Complete: ☐ No ☒ Yes

Queries:

Completed Tasks

Complete:

Basics of APIs

- Protocol
 - APIs rely on HTTP messages and methods
- Programming
 - Use ExpressJS to expose your internal services using external APIs
- Connecting
 - Leverage client platforms (browser, CLI, etc.) to interact with APIs



The Basics of APIs

Pulling it all together