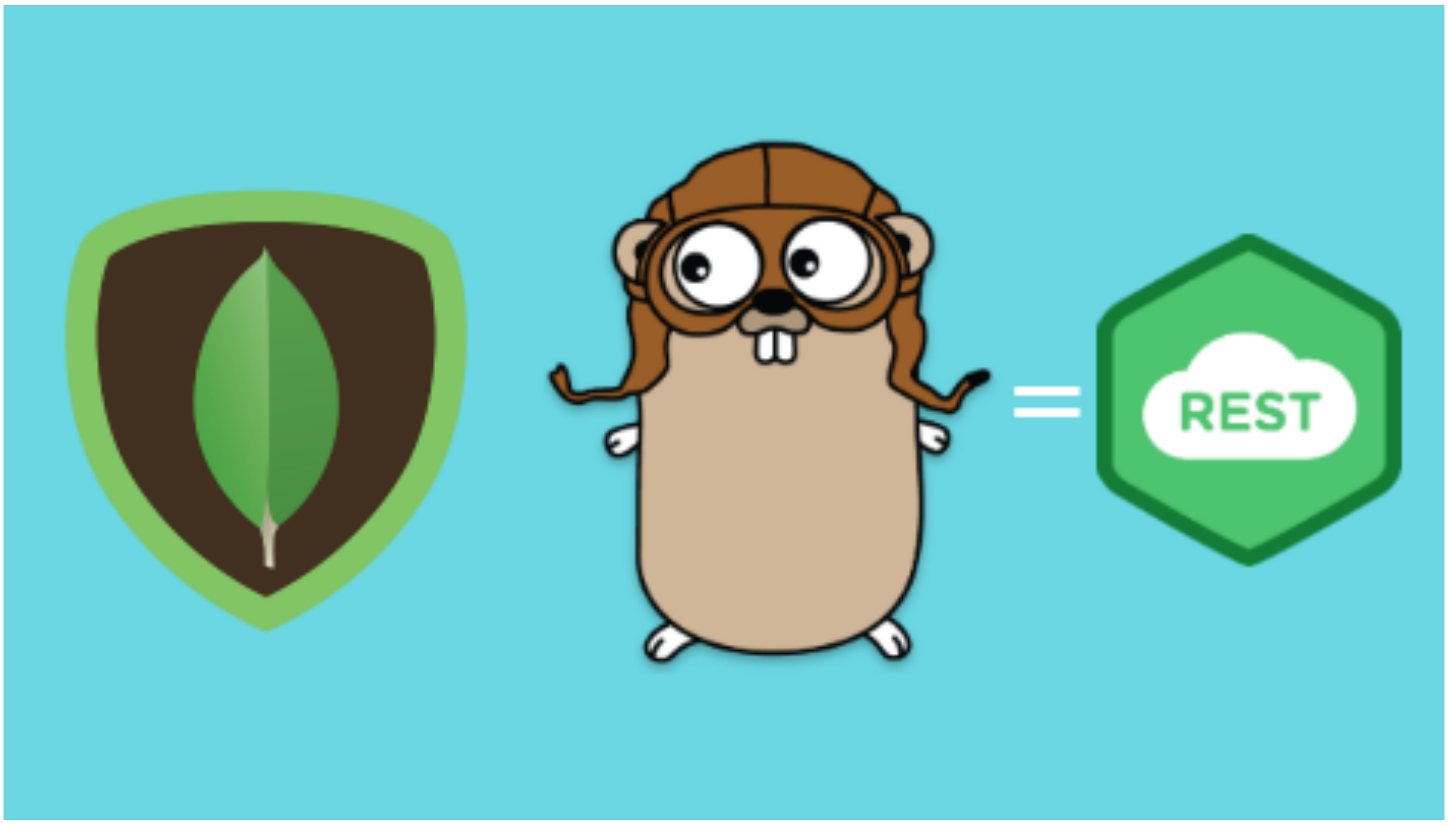
Build RESTful API in Go and MongoDB

Originally published by Mohamed Labouardy on November 11th 2017 ★ 45,401 reads

1

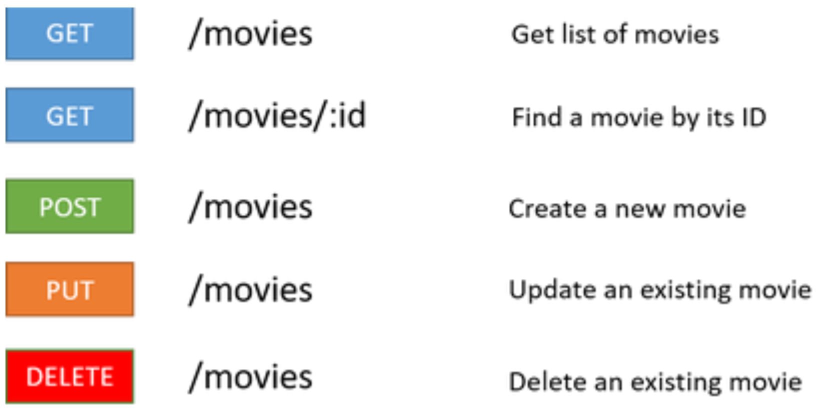


@mlabouardy
Mohamed Labouardy

In this tutorial I will illustrate how you can build your own **RESTful API** in **Go** and **MongoDB**. All the code used in this demo can be found on my Github.

1 — API Specification

The **REST API service** will expose endpoints to manage a store of movies. The operations that our endpoints will allow are:



GET	/movies	Get list of movies
GET	/movies/:id	Find a movie by its ID
POST	/movies	Create a new movie
PUT	/movies	Update an existing movie
DELETE	/movies	Delete an existing movie

2 — Fetching Dependencies

Before we begin, we need to get the packages we need to setup the API:

```
go get github.com/BurntSushi/toml gopkg.in/mgo.v2 github.com/gorilla/mux
```

- **toml** : Parse the configuration file (**MongoDB** server & credentials)
- **mux** : Request router and dispatcher for matching incoming requests to their respective handler
- **mgo** : **MongoDB** driver

3 — API structure

Once the dependencies are installed, we create a file called “**app.go**“, with the following content:

```go
package main

import (
	"fmt"
	"log"
	"net/http"

	"github.com/gorilla/mux"
)

func AllMoviesEndPoint(w http.ResponseWriter, r *http.Request) {
	fmt.Fprintln(w, "not implemented yet !")
}

func FindMovieEndpoint(w http.ResponseWriter, r *http.Request) {
```

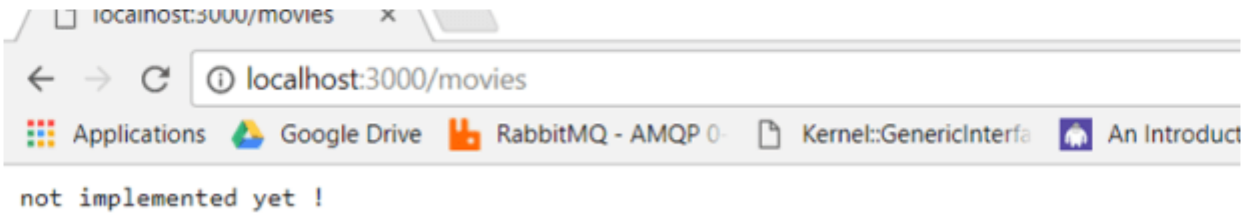
The code above creates a controller for each endpoint, then expose an **HTTP server** on port **3000**.

Note: We are using **GET**, **POST**, **PUT**, and **DELETE** where appropriate. We are also defining parameters that can be passed in

To run the server in local, type the following command:

go run app.go

If you point your browser to **http://localhost:3000/movies**, you should see:



```
not implemented yet !
```

4 — Model

Now that we have a minimal application, it's time to create a basic **Movie** model. In **Go**, we use **struct** keyword to create a model:

```go
type Movie struct {
	ID          bson.ObjectId `bson:"_id" json:"id"`
	Name        string        `bson:"name" json:"name"`
	CoverImage  string        `bson:"cover_image" json:"cover_image"`
	Description string        `bson:"description" json:"description"`
}
```

movie.go hosted with ❤ by **GitHub** view raw

Next, we will create the **Data Access Object** to manage database operations.

5 — Data Access Object

5.1 — Establish Connection

```go
package dao

import (
	"log"

	"github.com/mlabouardy/movies-restapi/models"
	mgo "gopkg.in/mgo.v2"
	"gopkg.in/mgo.v2/bson"
)

type MoviesDAO struct {
	Server   string
	Database string
}

var db *mgo.Database

const (
	COLLECTION = "movies"
)

func (m *MoviesDAO) Connect() {
	session, err := mgo.Dial(m.Server)
	if err != nil {
		log.Fatal(err)
	}
	db = session.DB(m.Database)
}
```

movies_dao.go hosted with ❤ by **GitHub** view raw

The **connect()** method as its name implies, establish a connection to **MongoDB database.**

5.2 — Database Queries

The implementation is relatively straighforward and just includes issuing right method using **db.C(COLLECTION)** object and returning the results. These methods can be implemented as follows:

```go
func (m *MoviesDAO) FindAll() ([]Movie, error) {
	var movies []Movie
	err := db.C(COLLECTION).Find(bson.M{}).All(&movies)
	return movies, err
```

```
	err := db.C(COLLECTION).FindId(bson.ObjectIdHex(id)).One(&movie)
	return movie, err
}

func (m *MoviesDAO) Insert(movie Movie) error {
	err := db.C(COLLECTION).Insert(&movie)
	return err
```

6 — Setup API Endpoints

6.1 — Create a Movie

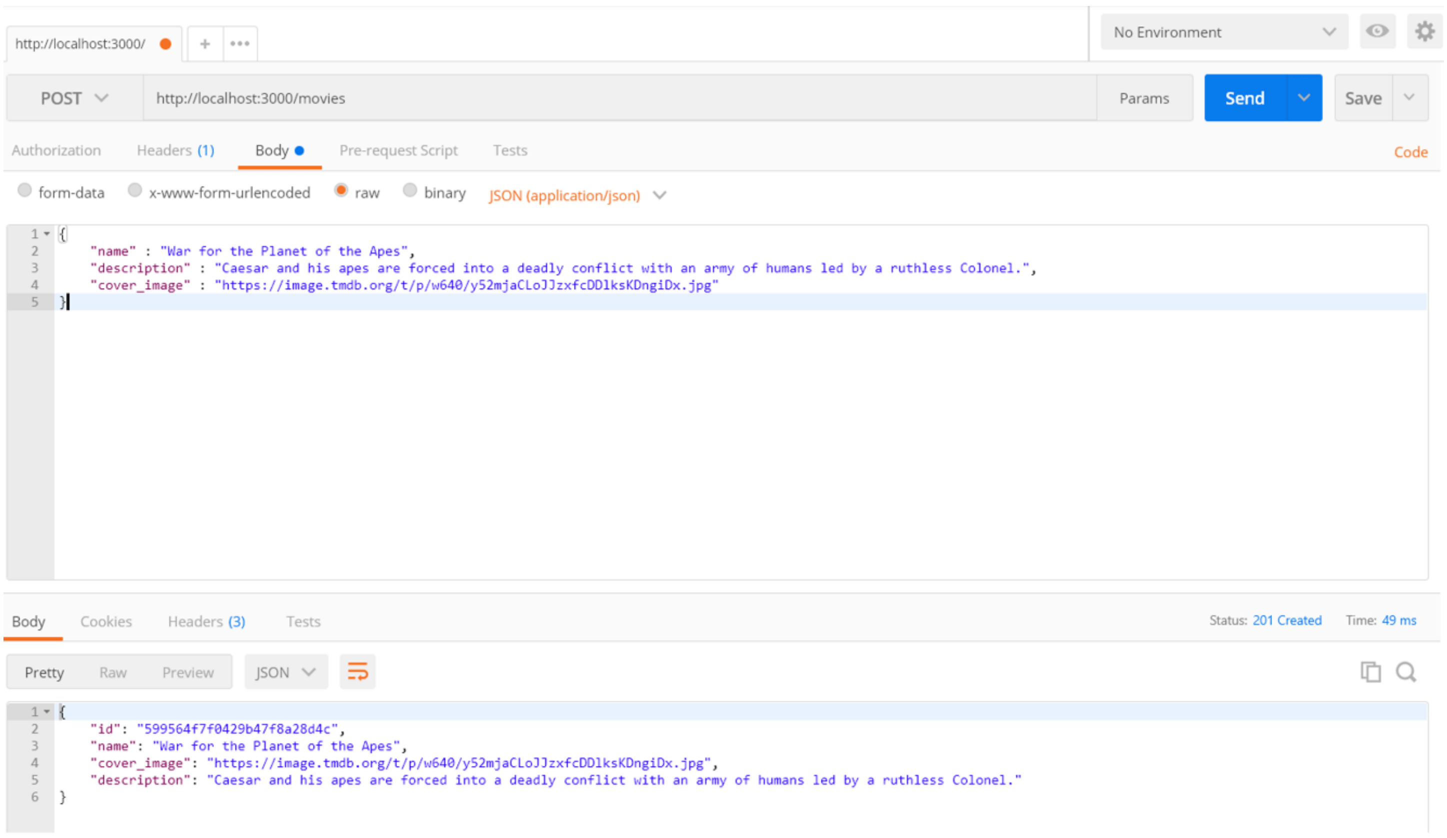
Update the **CreateMovieEndpoint** method as follows:

```
func CreateMovieEndPoint(w http.ResponseWriter, r *http.Request) {
	defer r.Body.Close()
	var movie Movie
	if err := json.NewDecoder(r.Body).Decode(&movie); err != nil {
		respondWithError(w, http.StatusBadRequest, "Invalid request payload")
		return
	}
	movie.ID = bson.NewObjectId()
	if err := dao.Insert(movie); err != nil {
		respondWithError(w, http.StatusInternalServerError, err.Error())
		return
	}
	respondWithJson(w, http.StatusCreated, movie)
}
```

It decodes the request body into a **movie** object, assign it an **ID**, and uses the **DAO Insert** method to create a **movie** in database.

Let's test it out:

With **Postman**:



http://localhost:3000/movies

```
{
    "name" : "War for the Planet of the Apes",
    "description" : "Caesar and his apes are forced into a deadly conflict with an army of humans led by a ruthless Colonel.",
    "cover_image" : "https://image.tmdb.org/t/p/w640/y52mjaCLoJJzxfcDDlksKDngiDx.jpg"
}
```

Status: 201 Created Time: 49 ms

```
{
    "id": "599564f7f0429b47f8a28d4c",
    "name": "War for the Planet of the Apes",
    "cover_image": "https://image.tmdb.org/t/p/w640/y52mjaCLoJJzxfcDDlksKDngiDx.jpg",
    "description": "Caesar and his apes are forced into a deadly conflict with an army of humans led by a ruthless Colonel."
}
```

With **cURL**

curl -sSX POST -d ‘{“name”:”dunkirk”,”cover_image”:’https://image.tmdb.org/t/p/w640/cUqEgoP6kj8ykfNjJx3Tl5zHCcN.jpg", “description”:”world war 2 movie”}’ http://localhost:3000/movies | jq ‘.’

6.2 — List of Movies

The code below is self explanatory:

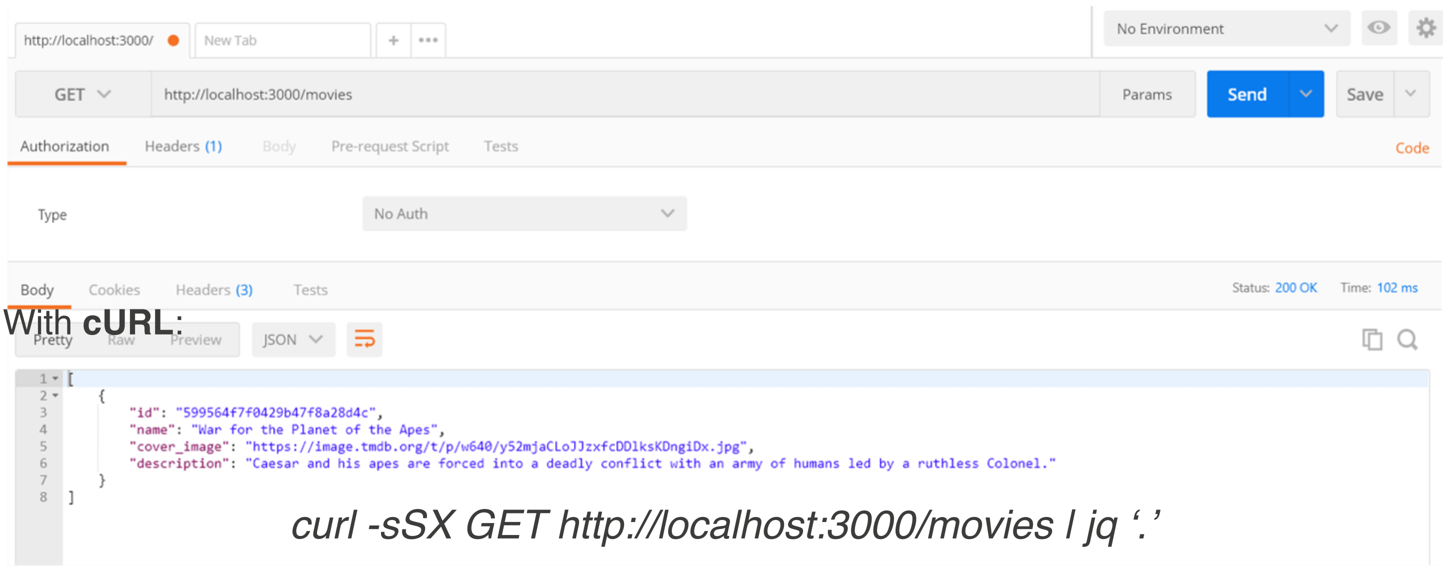
```
func AllMoviesEndPoint(w http.ResponseWriter, r *http.Request) {
        movies, err := dao.FindAll()
        if err != nil {
                respondWithError(w, http.StatusInternalServerError, err.Error())
                return
        }
        respondWithJson(w, http.StatusOK, movies)
}
```

app.go hosted with ❤ by GitHub view raw

It uses **FindAll** method of **DAO** to fetch list of movies from database.

Let’s test it out:

With **Postman**:



GET http://localhost:3000/movies

Type: No Auth

Status: 200 OK Time: 102 ms

JSON

```
[
    {
        "id": "599564f7f0429b47f8a28d4c",
        "name": "War for the Planet of the Apes",
        "cover_image": "https://image.tmdb.org/t/p/w640/y52mjaCLoJJzxfcDDlksKDngiDx.jpg",
        "description": "Caesar and his apes are forced into a deadly conflict with an army of humans led by a ruthless Colonel."
    }
]
```

With **cURL**:

curl -sSX GET http://localhost:3000/movies | jq ‘.’

6.3 — Find a Movie

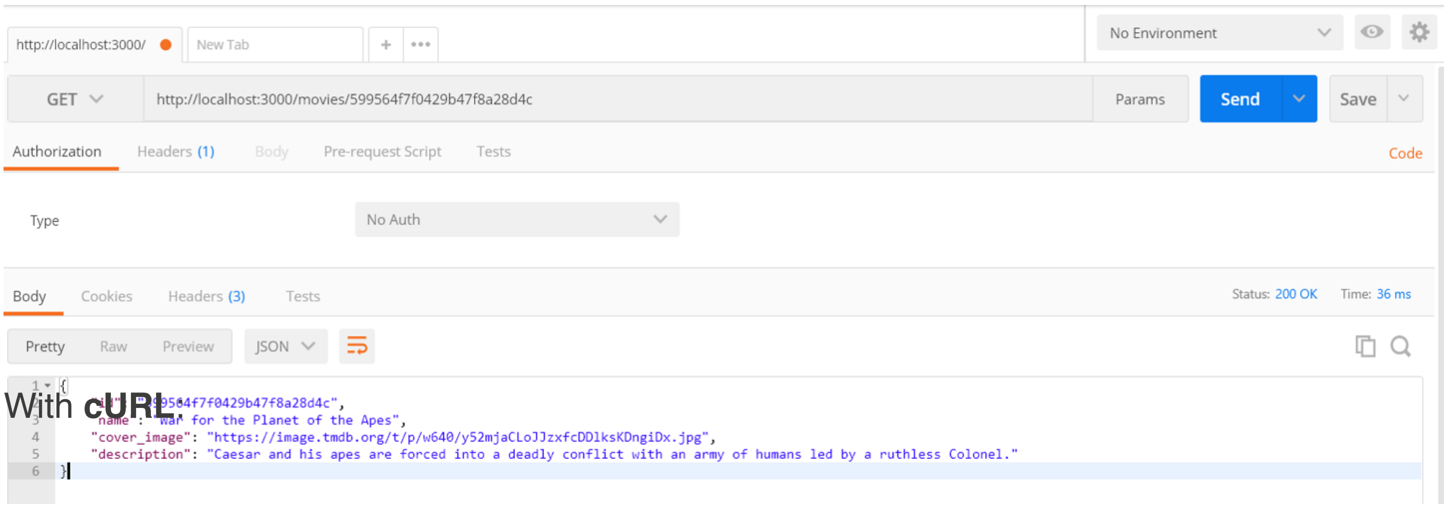
We will use the **mux** library to get the parameters that the users passed in with the request:

```go
func FindMovieEndpoint(w http.ResponseWriter, r *http.Request) {
	params := mux.Vars(r)
	movie, err := dao.FindById(params["id"])
	if err != nil {
		respondWithError(w, http.StatusBadRequest, "Invalid Movie ID")
		return
	}
	respondWithJson(w, http.StatusOK, movie)
}
```

app.go hosted with ❤ by GitHub view raw

Let's test it out:

With **Postman**:



GET http://localhost:3000/movies/599564f7f0429b47f8a28d4c

Type: No Auth

Status: 200 OK Time: 36 ms

```json
{
    "id": "599564f7f0429b47f8a28d4c",
    "name": "War for the Planet of the Apes",
    "cover_image": "https://image.tmdb.org/t/p/w640/y52mjaCLoJJzxfcDDlksKDngiDx.jpg",
    "description": "Caesar and his apes are forced into a deadly conflict with an army of humans led by a ruthless Colonel."
}
```

With **cURL**:

curl -sSX GET http://localhost:3000/movies/599570faf0429b4494cfa5d4 | jq '.'

6.4 — Update an existing Movie

6.4 — Update an existing Movie

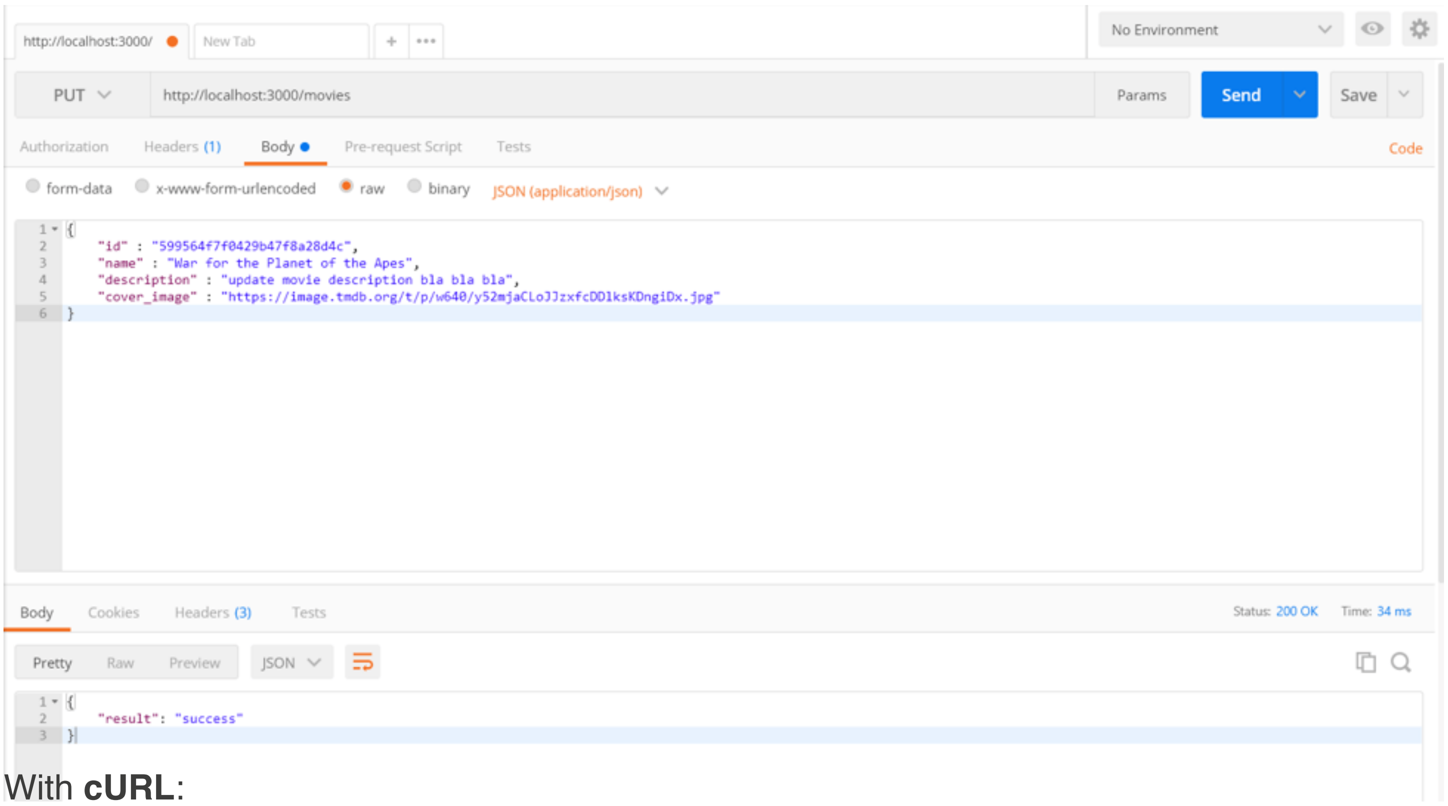
Update the **UpdateMovieEndPoint** method as follows:

```go
func UpdateMovieEndPoint(w http.ResponseWriter, r *http.Request) {
	defer r.Body.Close()
	var movie Movie
	if err := json.NewDecoder(r.Body).Decode(&movie); err != nil {
		respondWithError(w, http.StatusBadRequest, "Invalid request payload")
		return
	}
	if err := dao.Update(movie); err != nil {
		respondWithError(w, http.StatusInternalServerError, err.Error())
		return
	}
	respondWithJson(w, http.StatusOK, map[string]string{"result": "success"})
}
```

app.go hosted with ❤ by GitHub view raw

Let's test it out:

With **Postman**:



PUT http://localhost:3000/movies

Body: raw, JSON (application/json)

```json
{
    "id" : "599564f7f0429b47f8a28d4c",
    "name" : "War for the Planet of the Apes",
    "description" : "update movie description bla bla bla",
    "cover_image" : "https://image.tmdb.org/t/p/w640/y52mjaCLoJJzxfcDDlksKDngiDx.jpg"
}
```

Status: 200 OK Time: 34 ms

JSON

```json
{
    "result": "success"
}
```

With **cURL**:

curl -sSX PUT -d ‘{“name”:”dunkirk”,”cover_image”:’https://image.tmdb.org/t/p/w640/cUqEgoP6kj8ykfNjJx3Tl5zHCcN.jpg", “description”:”world war 2 movie”}’ http://localhost:3000/movies | jq ‘.’

6.5 — Delete an existing Movie

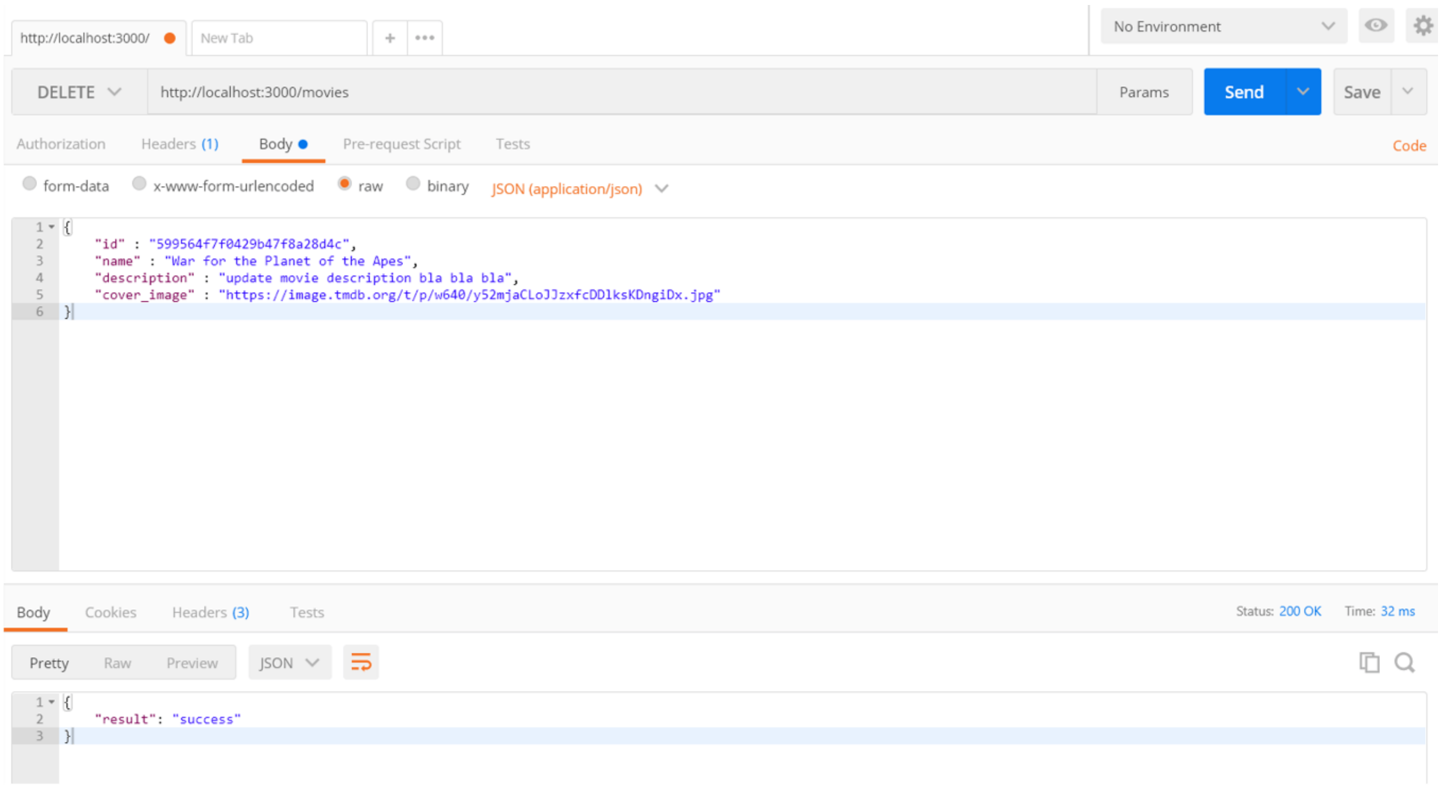
Update the **DeleteMovieEndPoint** method as follows:

```go
func DeleteMovieEndPoint(w http.ResponseWriter, r *http.Request) {
	defer r.Body.Close()
	var movie Movie
	if err := json.NewDecoder(r.Body).Decode(&movie); err != nil {
		respondWithError(w, http.StatusBadRequest, "Invalid request payload")
		return
	}
	if err := dao.Delete(movie); err != nil {
		respondWithError(w, http.StatusInternalServerError, err.Error())
		return
	}
	respondWithJson(w, http.StatusOK, map[string]string{"result": "success"})
}
```

app.go hosted with ❤ by **GitHub** **view raw**

Let’s test it out:

With **Postman**:



DELETE http://localhost:3000/movies

raw JSON (application/json)

```
{
    "id" : "599564f7f0429b47f8a28d4c",
    "name" : "War for the Planet of the Apes",
    "description" : "update movie description bla bla bla",
    "cover_image" : "https://image.tmdb.org/t/p/w640/y52mjaCLoJJzxfcDDlksKDngiDx.jpg"
}
```

Body — Status: 200 OK Time: 32 ms

Pretty JSON

```
{
    "result": "success"
}
```

With **cURL**:

curl -sSX DELETE -d ‘{“name”:”dunkirk”,”cover_image”:’https://image.tmdb.org/t/p/w640/cUqEgoP6kj8ykfNjJx3Tl5zHCcN.jpg", “description”:”world war 2 movie”}’ http://localhost:3000/movies | jq ‘.’

Taking this further ? On my upcoming posts, I will show you how :

- Write **Unit Tests** in **Go** for each Endpoint
- Build a UI in **Angular 4**
- Setup a **CI/CD** with **CircleCI**
- Deploy the stack on **AWS** and much more …

So stay tuned !

1

Share this story

@mlabouardy

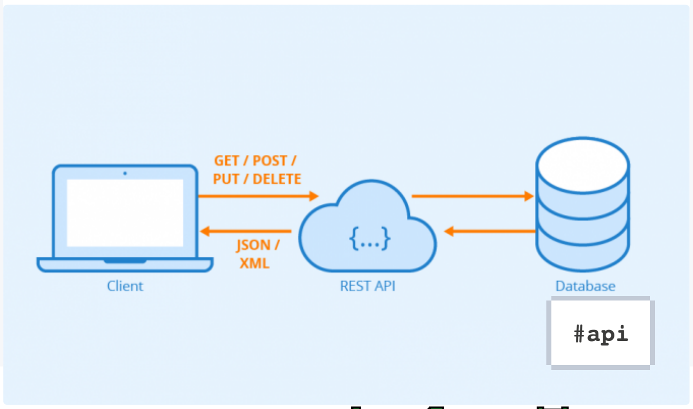
Mohamed Labouardy

Read my stories

RELATED

What are APIs and REST APIs? - A Simple Explanation

3 reactions



#api

Github Actions and Go: AreYouOk My URL?

9 reactions

AreYouOk URL Health Report

74 URLs were analyzed across 31 files under 11.16s

▼ Not OK URLs

URL	Message
http://freecodecamp.org`	Get : http: nil Request.URL
http://127.0.0.1:8000/	Get http://127.0.0.1:8000/: dial tcp 127.0.0.1:8000: connect: connection refused
heck/blob/master/docs/docs.md	Not Found
&id=$get_last	Not Found
	Not Found
RT-ID>	

#github

@bhupesh

Bhupesh Varshney

02/10/21

TAGS

#golang #mongodb #rest-api #api

Join Hacker Noon

Create your free account to unlock your custom reading experience.