WHAT IS NPM?

npm is Node.js' package ecosystem. It is the largest ecosystem of open-source libraries in the world. It is also the name of the command line package manager used to interact with **npm**.

EXAMPLE

Let say you want to use a third party library in your project “typescript” Now this package manager npm will help you to download that library in your project

Commands to use npm

To install a library - npm i “library name”

To update a library - npm update “library name”

To remove a library - npm uninstall “library name”

WHAT IS LOCAL , SESSION STORAGE & COOKIES

Local Storage - It is used to save data in key value pair. Example, username:"shagun"

Things to keep in mind.

Each window of browser has a different local storage which means if your site is www.xyz.com then local storage of xyz is different from google.com

Data will be stored even when browser is Closed. So there is no expiration time

What to store in Local Storage

Any kind of data which you need to store even when browser is closed

Session Storage - It is same as Local Storage. It is used to save data in key value pair. Example, username:"shagun"

Things to keep in mind.

Each window of browser has a different Session storage which means if your site is www.xyz.com then local storage of xyz is different from google.com

Data will be Lost when browser is Closed. So there is expiration time

So here, data is kept only for the particular session instead of whole time

What to store in Session Storage

Any kind of data which you need to store Only for that particular session

Example you want user to get logout once browser is closed or tab is closed. (session is over)

Cookies - Cookies were invented to solve the problem "how to remember information about the user"

Things to keep in mind.

When a browser requests a web page from a server, cookies belonging to the page are added to the request. This way the server gets the necessary data to "remember" information about users.

So we can say that cookies are used to transfer data from client (browser or app) to server

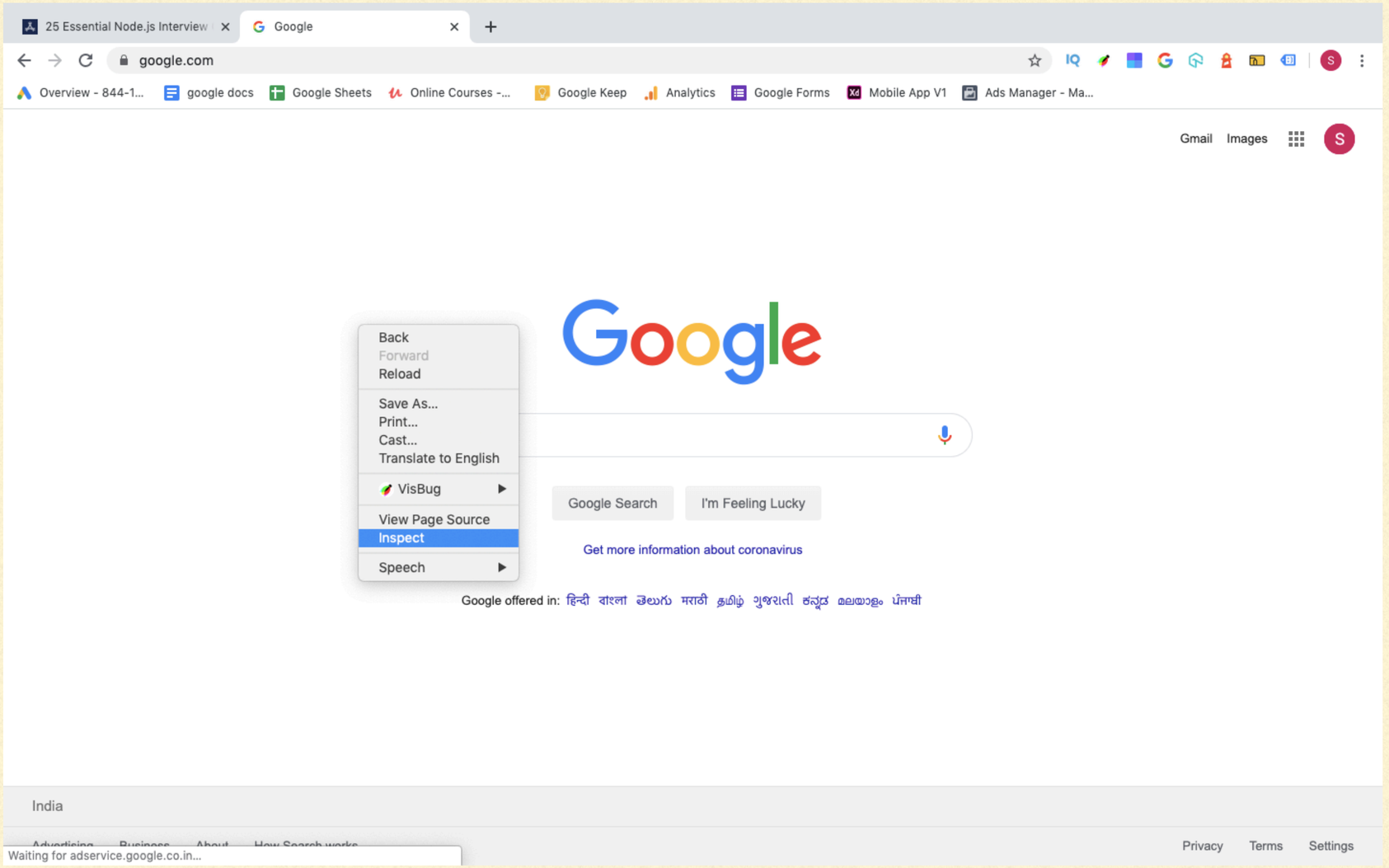
What to store in Cookies

Any kind of data which you need to Send from client to server for communication

Generally, Cookies are used to track user. which is also known as digital footprinting. It's a wide topic

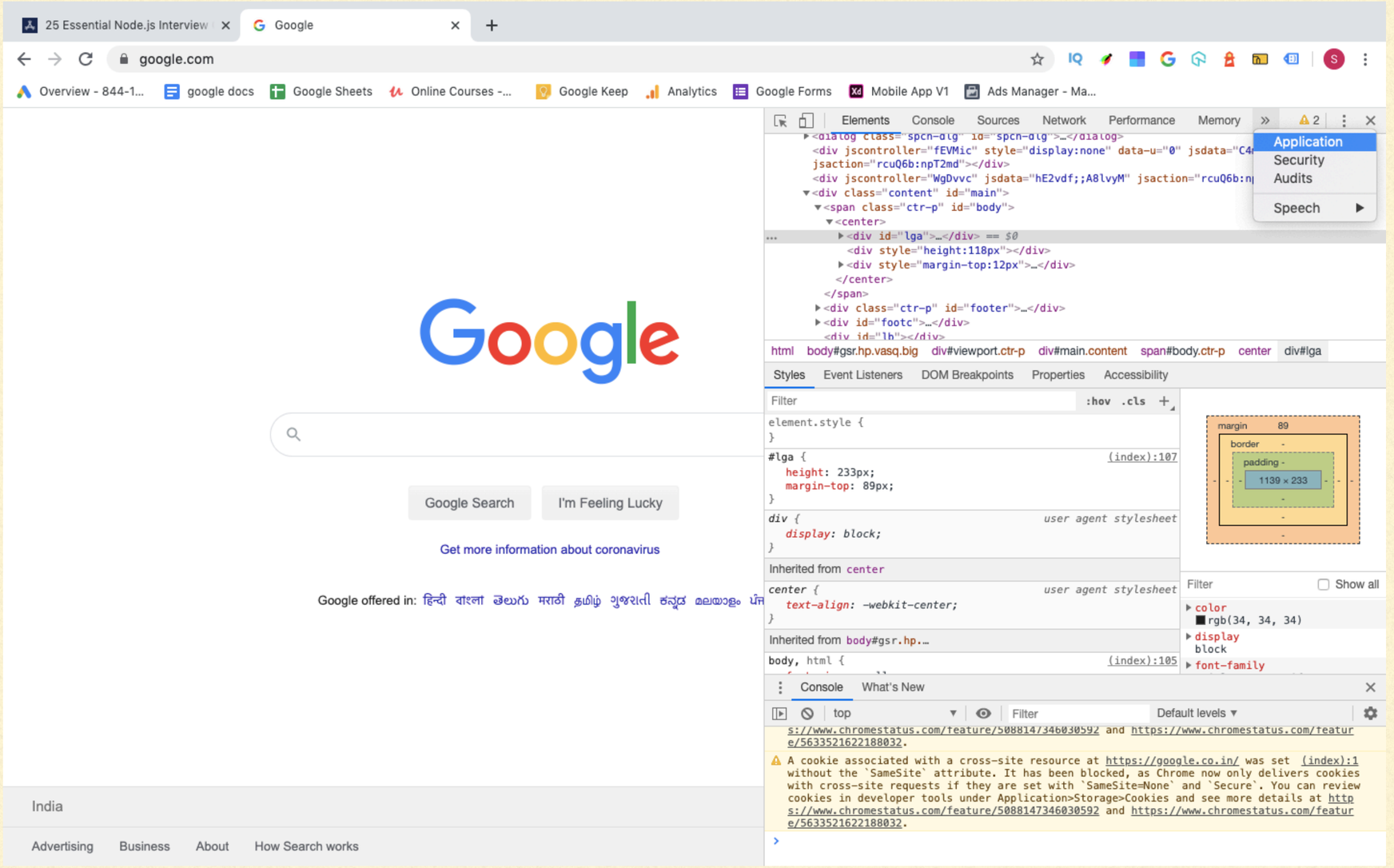
How to Check what is there in these storages?

STEP 1 : right click and choose inspect

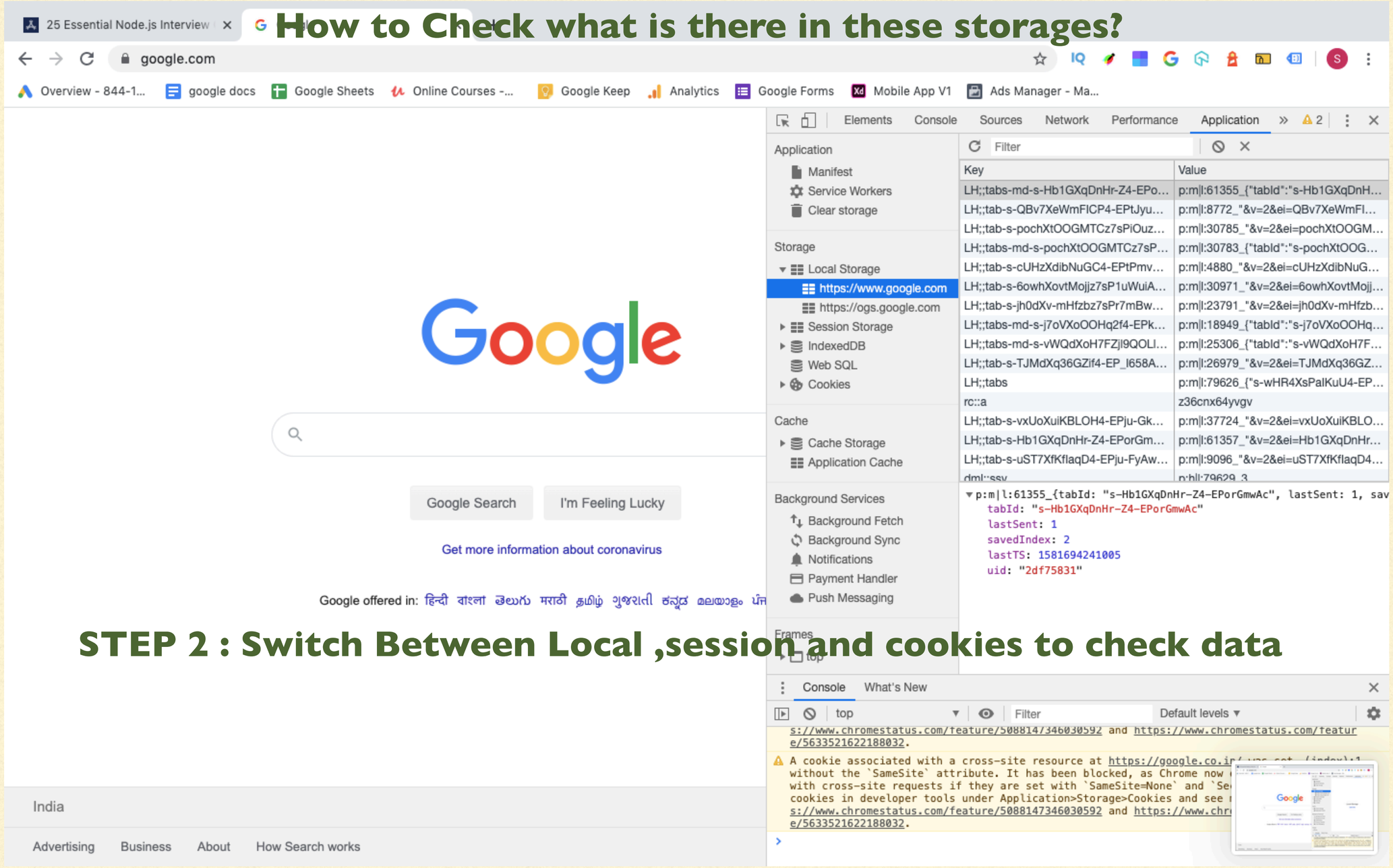


How to Check what is there in these storages?

STEP 2 : choose Application



How to Check what is there in these storages?



STEP 2 : Switch Between Local ,session and cookies to check data

How to Avoid Callbacks? / Alternative to Callbacks

```
app.listen(5000,((error,response)=>{
if (error){
console.log("error")
}else{
console.log('success')
}
})
```

callbacks give you two things error and response. (Remember callbacks are asynchronous)
Now the problem is it does not looks good. **So what to Do**

```
const handleResponse = ()=>{
if (error){
console.log("error")
}else{
console.log('success')
}
}
```

write a arrow function

```
app.listen(5000,handleResponse)
```

pass arrow function to it

How Does Node.js support Multi Core processor? Should we go for it?

Nodejs use single thread so it can't take any advantage of multi cores.

When we host our server then always keep this in mind never for many cores because it can't use them

cores are used by threads but here it has only single thread

What is REPL in Nodejs?

R - Read

E - Evaluate

P- Print

L- Loop

Read – Reads user's input, parse the input into JavaScript data-structure and stores in memory.

Eval – Takes and evaluates the data structure

Print – Prints the result

Loop – Loops the above command until user press ctrl-c twice.

Explain Event Loop in Nodejs?/ how nodejs handle traffic even on single thread?

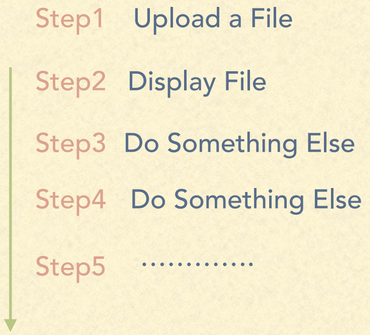
In Node Js processes are single threaded, to supports concurrency it uses events and callbacks. An event loop is a mechanism that allows Node.js to perform non-blocking I/O operations.

CHECK NEXT SLIDE FOR A DETAILED EXAMPLE

Blocking Vs Non Blocking Code?

Blocking

- ✓ Upload a File.
- ✓ Then, Display The file.
- ✓ Do Something else.



Non-Blocking

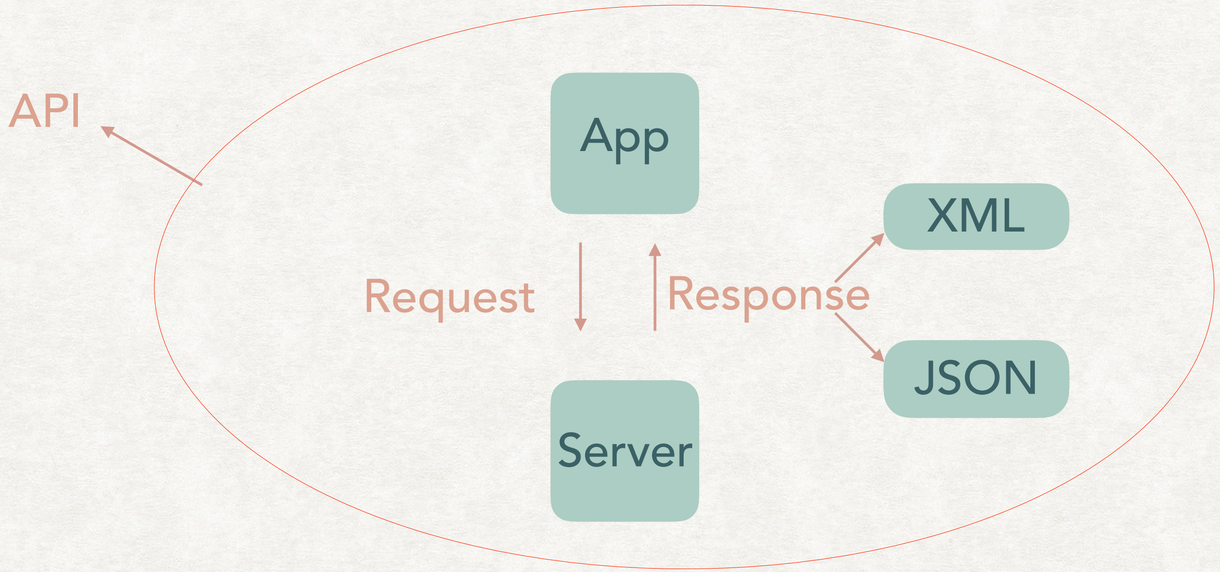
- ✓ Upload a File.
- ✓ Do Something else.
- ✓ Display when Upload completes.

WHAT IS REST API?

REST - Representational State Transfer

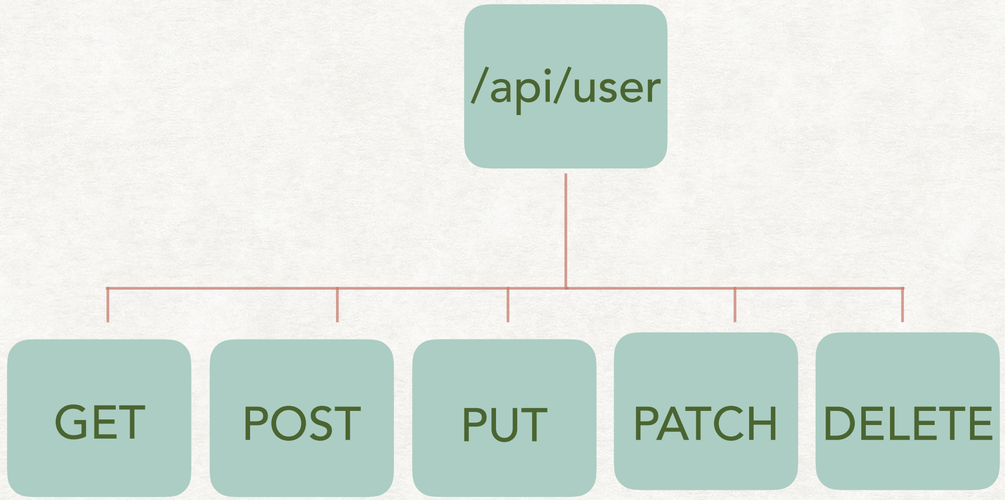
API- Application Programming Interface

"A Good Application is the one which can also interact with other applications"

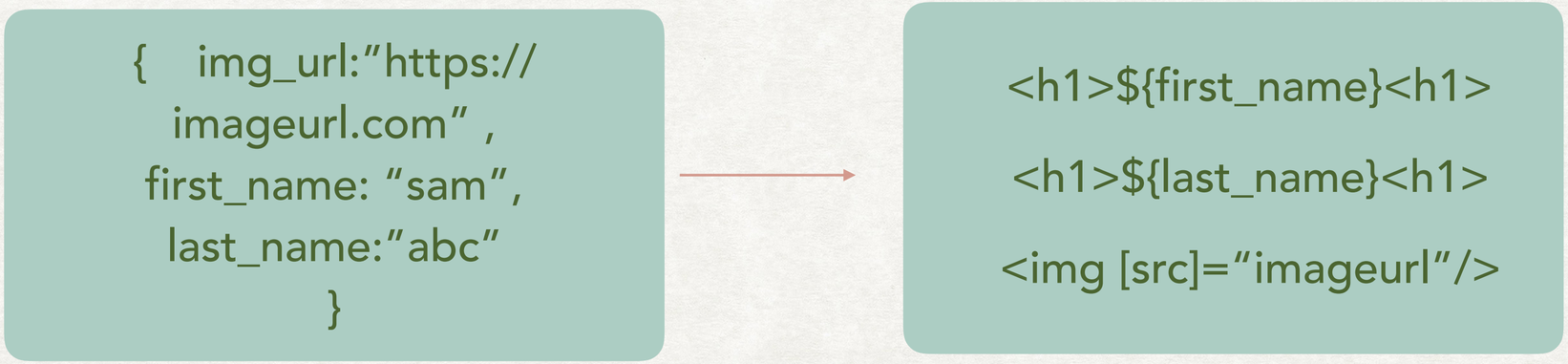


REST - Representational State Transfer

"They are Stateless Backend"



"JSON DATA collected from api can be shown in any Format"



JSON STATE at server

HTML STATE at Frontend

What functions are available in Express.js

Express JS is an application framework which is light-weighted node JS. A number of flexible, useful and important features are provided by this JavaScript framework for the development of mobile as well as web applications with the help of node JS.

How does cookies and session used to authenticate users?

We can use cookies to store unique id of our user who has sent a login request

“This cookie is set by server”

By session what we mean is that data is kept only for a particular session

Advantage of this approach?

You can maintain sessions of user. It means you can see how many people are currently loggedIn and from which device

Example - Suppose a user wants to see on how many devices his id is logged in like facebook shows you.

You can allow user to log out from all devices like facebook does. But you can’t do this with jwt because in case of jwt token is stored on client side. but in cookies access to login a user is in servers hand instead of client

Problem with this approach is that all data of sessions is stored in database. So you need to maintain it. So it may create problem in scaling up with number of users

what is js engine/ v8 engine?

A Javascript Engine is a program that converts code written in Javascript to something that computer processor understands.

Like in case of nodejs js code is converted into machine code (c++)

V8 is Google's open source high-performance JavaScript engine, written in C++ and used in Google Chrome, the open source browser from Google, and in Node.js, among others.

You can check the whole detail about v8 from here : CLICK HERE

IS Nodejs Scalable? How Scalable is it?

Many People think that You can't Scale up nodejs. Why? Because it works on single Thread?

But it is wrong to say that nodejs is not scalable. It is Scalable but it depends on the use case.
As we know nodejs works on Single Thread and asynchronously along with non-blocking event loop

Use case where Nodejs Should Not Be Used

Suppose you are making a server which will take a video url in request and going to process a video that is compression and adding a watermark in video let's say.

Now note it down that video processing is going to take a lot of time so in such cases nodejs won't be able to handle many requests

Reason why it won't be able to handle much request in such cases?

CPU Power will get exhausted because of so much processing at same time and specially on a single thread

Solution

If you still wants to use Nodejs for such cases then use cloud functions

Hosting Nodejs as a cloud function means that particular function will be called and handle the processing

What is a Cloud Function?

Cloud Functions works server-less. That means there is not server but whenever you need to call a particular piece of code you can call it using your function.

It is also known as micro-service to use cloud functions with nodejs like this.
you can host a cloud function on aws, google

ONLY PROBLEM WITH CLOUD FUNCTIONS IS THAT IT WILL TAKE AROUND 1 MIN TO START LISTENING FIRST REQUEST. IF NO REQUEST CAME IN LAST 30MINS

WHAT IS NAMESPACE IN MONGODB?

MongoDB stores BSON (Binary Interchange and Structure Object Notation) objects in the collection. The concatenation of the collection name and database name is called a namespace.

In simple words we can say that it is just a reference of each collection with database
it looks like this = admin.system.users

Syntax of namespace is database.system.collectionName

WHILE CREATING SCHEMA IN MONGODB. WHAT ARE THE POINTS YOU NEED TO TAKE CARE OF?

Design Your schema according to your requirement.
Example, if you want to save a user than define your user according to your requirement like what details of user you want to store?

Use Virtual Fields for those fields which can be work as a getter function

OBJECT ID OF MONGODB CONTAIN WHAT DATA?

1. Timestamp - Time at which it was created in Number Format like (1584964002266)

"Timestamp contains value of current date and time in numbers"

2. Client machine ID - each and every device has a unique machine id

3. Client process ID - You can check your device client process id in task manager inside check for processes

4. 3 byte incremented counter - Mongodb automatically increment 3 bytes when it created a new ObjectId