SNS COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

Course Code and Name : 19TS601 FULL STACK DEVELOPMENT

Unit 3 : NODEJS AND EXPRESS

Topic : Node.js EventEmitter

NodeJS EventEmitter

- The EventEmitter class in NodeJS is a core module that provides a way to handle asynchronous events.
- It allows objects to emit events and other objects to listen and respond to those events.

Event Emitter in Node

- NodeJS uses an events module to create and handle custom events.
- The EventEmitter class can be used to create and handle a custom events module.

Importing EventEmitter

- The syntax to Import the events module is given below:

Syntax

```
const EventEmitter = require('events');
```

- All EventEmitters emit the event newListener when new listeners are added and removeListener when existing listeners are removed.
- It also provides one more option:

```
boolean captureRejections

Default Value: false
```

- It automatically captures rejections.

Listening events

- Before emits any event, it must register functions(callbacks) to listen to the events.

Syntax

```
eventEmitter.addListener(event, listener)
eventEmitter.on(event, listener)
```

- eventEmitter.on(event, listener) and eventEmitter.addListener(event, listener) are pretty much similar.
- It adds the listener at the end of the listener's array for the specified event.
- Multiple calls to the same event and listener will add the listener multiple times and correspondingly fire multiple times.
- Both functions return emitter, so calls can be chained.

Emitting events

- In NodeJS, each event is represented by a specific event name.
- We can trigger an event using the emit(event, [arg1], [arg2], […]) function.
- Arbitrary arguments can be passed to the listener functions when the event is emitted.

Syntax:

```
eventEmitter.emit(event, [arg1], [arg2], [...])
```

- To create an EventEmitter instance in NodeJS, register a listener for a custom event, and emit that event with a message.

- **// Importing events**

```
const EventEmitter = require('events');
```

- **// Initializing event emitter instances**

```
let eventEmitter = new EventEmitter();
```

```
// Registering to myEvent
eventEmitter.on('myEvent', (msg) => {
  console.log(msg);
});

// Triggering myEvent
eventEmitter.emit('myEvent', "First event");
```

Output:

First event

Removing Listener

- The eventEmitter.removeListener() takes two argument event and listener, and removes that listener from the listeners array that is subscribed to that event.
- While eventEmitter.removeAllListeners() removes all the listener from the array which are subscribed to the mentioned event.

Syntax:

eventEmitter.removeListener(event, listener)

eventEmitter.removeAllListeners([event])

- Node.js has revolutionized server-side development with its non-blocking, event-driven architecture, making it a favorite among developers for building fast and scalable network applications.
- To streamline development and enhance functionality, various frameworks have been built on top of Node.js

What is a Node Framework ?

- A framework is a collection of various libraries and tools that are required in the development process of a software application.
- It acts as a base on which different software applications can be developed.
- A node framework is a workspace platform that supports the use of Node.js and which allows developers to use JavaScript for developing front end as well as the back end of an application.
- Node frameworks are a wide collection of frameworks built on Node and that extend its properties and functionalities further.

Benefits of Node Framework

- Productivity
- Scalability
- Speed
- Same Languages for Front-end and Back-end
- Maintaining Code standards across a team

Types of Node frameworks

- There are basically three types of Node Frameworks such as:
- **MVC:** This type of framework splits the application into three sections with each performing its own functionality of models, views and control.
- **Full-stack MVC:** This type of framework is used in real-world environment to make applications and have various libraries, template engine and other types of development tools
- **REST API Frameworks:** This type of frameworks are used to create RESTful APIs also known as Respresentational State Transfer.

Top Node.js Frameworks

1. Express.js

Fast, robust, and asynchronous MVC framework

Simplifies server routing and dynamic HTML rendering

High-speed I/O, single-threaded, and widely used in many frameworks

2. AdonisJS

MVC framework with a focus on stability

Requires less code for web application development

Provides built-in testing modules to enhance efficiency

3. MeteorJS

- Open-source framework for cross-platform development
- Ideal for rapid prototyping
- Works with its own templating engine or integrates with others

4. NestJS

- Suitable for building efficient server-side applications
- Supports TypeScript and OOP, FP, FRP paradigms
- Strongly structured for scalable applications

5. SailsJS

- MVC-based framework, built on Node.js
- Eases the development of customized web apps and APIs

6. Hapi.js

- Open-source MVC framework for web applications and APIs
- Features robust plugin system, input validation, and caching
- Ideal for building REST APIs and scalable applications

7. Loopback.io

- Highly extensible framework for creating REST APIs
- Offers authentication, model relation maintenance, and multiple backend integrations

8. Feathers.js

- Lightweight, real-time framework built on Express.js
- Works well with client-side frameworks
- Supports SMS, authentication, and email messaging via plugins

9. MEAN.JS

- Full-stack framework (MongoDB, Express, Angular, Node.js)
- Helps in building secure and scalable web applications

10. KoaJS

- Developed by the Express team, but more modular
- Uses middleware functions for tasks like caching and proxy support

Express.js

- Express.js is the most popular Node.js framework, known for its minimalistic, unopinionated design.
- It provides a robust set of features for building web and mobile applications, making it a go-to choice for developers.

Key Features:

- Middleware support: Allows the use of middleware to handle requests.

- Routing: Provides a simple and flexible way to define routes.
- Performance: Lightweight and fast, ideal for high-performance applications.
- Template engines: Supports various template engines like Pug, EJS, and Handlebars.

Use Cases:

- RESTful APIs
- Single-page applications (SPAs)
- Web applications

1.What is eventemitter?

Text Book:

1.Pro MERN Stack, Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, A Press Publisher, 2019.

Reference:

David Flanagan, “Java Script: The Definitive Guide”, O’Reilly Media, Inc, 7 th Edition, 2020

2. Matt Frisbie, “Professional JavaScript for Web Developers” Wiley Publishing, Inc, 4th Edition, ISBN: 978-1-119-36656-0, 2019


Thank
You!