

# MULTER & SHARP – COMPLETE TOPIC EXPLANATION

## 1. What is Multer?

Multer is an Express middleware used to handle file uploads. It reads files sent from HTML forms using multipart/form-data encoding.

## 2. Why Multer is used?

Express cannot read image or file data by default. When a user uploads an image, it is sent as binary data. Multer understands this format and extracts files safely.

## 3. Installing and Requiring Multer

```
npm install multer
```

```
const multer = require("multer");
```

- require() imports the multer package so Node.js can use it.

## 4. Basic Multer Setup

```
const upload = multer({ dest: "uploads/" });
```

- multer() creates middleware
- dest tells where files should be stored

## 5. Uploading a Single Image

```
app.post("/upload", upload.single("image"), (req, res) => {  
  console.log(req.file); res.send("Uploaded"); });
```

- upload.single('image') runs before route logic
- req.file contains image info

## 6. Extracting Filename and Extension

```
const path = require("path"); const filename = req.file.filename; const ext =  
path.extname(req.file.originalname); const finalName = filename + ext;
```

- Multer gives a random filename
- Extension is taken from original file

## 7. What is Sharp?

Sharp is an image processing library. It is used to resize, convert, compress, and optimize images after upload.

## 8. Why Sharp is used?

Renaming an image does not change its format. Sharp actually converts image data correctly.

## 9. Installing and Requiring Sharp

```
npm install sharp
```

```
const sharp = require("sharp");
```

## 10. Understanding Sharp Pipeline

Sharp works in steps: configure first, execute last.

## 11. Converting Image to PNG

```
await sharp(req.file.path) .png() .toFile("uploads/output.png");
```

- sharp() reads image
- .png() applies format rule
- .toFile() executes and saves

## 12. Promise and Execution

.toFile() returns a Promise. await ensures image is saved before continuing.

## 13. Final Flow (Execution Order)

HTML → Multer → Temporary File → Sharp → Final Image

## 14. Final Rule

Multer uploads files. Sharp processes files. They are used together in real projects.