ExpressJS

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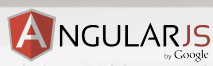
The MEAN Stack



Rich frontend framework

Web dev framework for NodeJS

Event-based concurrency framework

Key-value database

Why Express?

- Less code than NodeJS for Web apps:

```
var http = require("http");

http.createServer(function(request, response) {
  response.writeHead(200, {"Content-Type": "text/plain"});
  response.write("Hello World");
  response.end();
}).listen(3000);


console.log("Server running on http://localhost:3000");
```

Where are the paths? (no routing)

Why Express?

- Less code than NodeJS for Web apps:

```
var express = require("express");
var app = express(); //starts up your app

app.get("/",function(req,res){
   res.send("Hello world");
});

app.listen(3000);
console.log("Server started on http://localhost:3000");
```


Routing

- By HTTP method:
  - expressApp.**get**(urlPath, requestProcessFunction);
  - expressApp.**post**(urlPath, requestProcessFunction);
  - expressApp.**put**(urlPath, requestProcessFunction);
  - expressApp.**delete**(urlPath, requestProcessFunction);
  - expressApp.**all**(urlPath, requestProcessFunction);

httpRequest object

expressApp.get('/user/:user_id', function(**httpRequest**, httpResponse) …:

- request.params - Object containing url route params (e.g. user_id)
- request.query - Object containing query params
  - http://localhost?foo=9 ⇒ {foo: '9'}
- request.body - Object containing the parsed body
- request.get(field) - Return the value of the specified HTTP header field

httpResponse object

expressApp.get('/user/:user_id', function(httpRequest, **httpResponse**) …:

- response.write(content) - Build up the response body with content
- response.status(code) - Set the HTTP status code of the reply
- response.set(prop, value) - Set the response header property to value
- response.end() - End the request by responding to it
- response.end(msg) - End the request by responding with msg
- response.send(content) - Do a write and send

Methods returns the response object so they stack:

- response.status(code).write(content1).write(content2).end();

Middleware

- Examples:
  - Check to see if user is logged in, otherwise send error response and don't call **next**()
  - Parse the request body as JSON and attach the object to request.body and call **next**()
  - Session and cookie management, compression, encryption, etc.

Middleware: an example

```
var express = require('express');
var app = express();

var myLogger = function (req, res, next) {
  console.log('Logged:', Date.now());
  next();
};

app.use(myLogger);

app.get('/', function (req, res) {
  res.send('Hello World!');
});

app.listen(3000);
```


Middleware

- Give other software the ability to interpose on requests

expressApp.**all**(urlPath, function (request, response, **next**) {

// Do whatever processing on request (or setting response)

next(); // pass control to the next handler

});

- Interposing on all request using the route mechanism

expressApp.**use**(function (request, response, next) {...});

A simple Web Server

```
var express = require('express');
var app = express(); // Creating an Express "App"
app.use(express.static(__dirname)); // Adding middleware
app.get('/', function (request, response) {
// A simple request handler
response.send('Simple web server of files from ' + __dirname);
});
app.listen(3000, function () {
// Start Express on the requests
console.log('Listening at http://localhost:3000 exporting the directory
' +
__dirname);
});
```


Read express Documentation

app.use(express.static(__dirname));

Fetch from a JSON file

```
var fs = require('fs');
expressApp.get("/object/:objid", function (request, response) {
var dbFile = "DB" + request.params.objid;
fs.readFile(dbFile, function (error, contents) {
if (error) {
  response.status(500).send(error.message);
} else {
  var obj = JSON.parse(contents); // JSON.parse accepts Buffer types
  obj.date = new Date();
  response.set('Content-Type', 'application/json'); // Same as res.json(obj);
  response.status(200).send(JSON.stringify(obj));
}
});
Note: Make sure you always call end() or send()
});
```


DBProduct

```
{
	"name":"Product",
	"properties":
	{
		"id":
		{
			"type":"number",
			"description":"Product identifier",
			"required":true
		},
		"name":
		{
			"description":"Name of the product",
			"type":"string",
			"required":true
		},
		"price":
		{
			"type":"number",
```


DBProduct

```
			"minimum":0,
			"required":true
		},
		"tags":
		{
			"type":"array",
			"items":
			{
				"type":"string"
			}
		}
	}
}
```


Exercises

- print debugging information about different requests:
  - ?name=
  - ?name=...?address=…
- connect MongoDB to express and
  - answer an http query by accessing the database previously created