

Javascript Callbacks

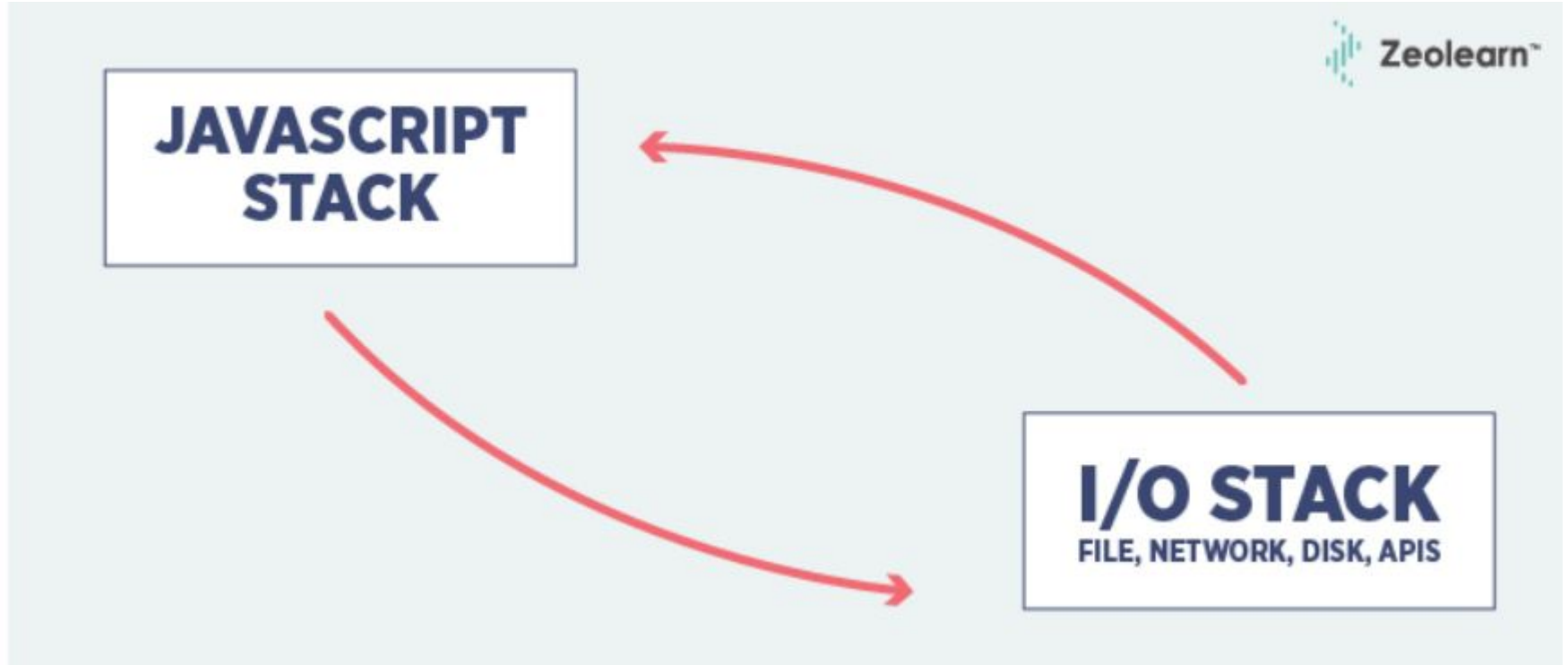
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Why use callbacks?

JavaScript code executes on a single thread and that too asynchronously. It means that the code execution stack doesn't wait on any I/O operation, which happens outside the JavaScript thread, for example, a file read operation. Callback functions are a means to drive the execution of the code once the I/O operation is completed.

This helps in a good way as it does not block the single threaded JavaScript code execution while waiting over any I/O operation and can execute the other functions in the stack. This is important in case of browsers, where the entire user experience is managed by the JavaScript rich applications since the inception of JavaScript.

Why use callbacks?



APIs

In the cases of GET API, we would like await for execution of the GET function before we would want to execute any function or dependencies on the API.

A Network Call based example

```
function getUsername(callback){
    var name;
    $.get('https://randomuser.me/api/', function(data) {
        name = data.results[0].name.first
            + " " + data.results[0].name.last;
        callback(name);
    });
}

var username ;

function callback(res){
    username = res;
    document.write("Name: " + username);
}

getUsername(callback);
```

DOM examples

We use callbacks when we need to execute certain functions when an event happens in the document. For eg, loading a document or click of a button etc.

```
var count = 0;

//callback 1
function updateCount(){
    $("#count").html(count);
}

//callback 2
function incCount() {
    count++;
    updateCount();
}

//callback 3
function resetCount(){
    count=0;
    updateCount();
}

$(document).ready(updateCount);
$("#inc").click(incCount);
$("#reset").click(resetCount);
```

Databases

We use callbacks to check if the returned data from databases to check if the value exists

```
module.exports.checkEmailInUse = (email, callback) => {  
  connection.query('SELECT `id` FROM `users` WHERE email = ?',  
    [  
      email  
    ],  
    function(err, rows, fields) {  
      if (err) return callback(err);  
      callback(null, rows.length > 0);  
    }  
  );  
}
```

continued..

```
Database.checkEmailInUse(email, function(err, exists) {  
  if (err) {  
    return callback({success: "false", message: "Error when checking the DB"});  
  }  
  if (exists) {  
    callback({success: "false", message: "Email Already In Use"});  
  } else {  
    callback({success: "true", message: "Come in!"});  
  }  
});
```

HTTP socket connections

Callbacks are also used when making HTTP connections and executing a function after a ping etc.

```
import ws from "k6/ws";
import { check } from "k6";

export default function() {
  var url = "ws://echo.websocket.org";
  var params = { "tags": { "my_tag": "hello" } };

  var response = ws.connect(url, params, function (socket) {
    socket.on('open', function open() {
      console.log('connected');
      socket.send(Date.now());

      socket.setInterval(function timeout() {
        socket.ping();
        console.log("Pinging every 1sec (setInterval test)");
      }, 1000);
    });

    socket.on('ping', function () {
      console.log("PING!");
    });

    socket.on('pong', function () {
```


Files

When we want to use some special changes on the fly using javascript on some files we use callbacks. An example below,

```
// The function that scales an images with canvas then runs a callback.
function scaleImage(url, width, height, liElm, callback){
    var img = new Image(),
        width = width,
        height = height,
        callback;

    // When the images is loaded, resize it in canvas.
    img.onload = function(){
        var canvas = document.createElement("canvas"),
            ctx = canvas.getContext("2d");

        canvas.width = width;
        canvas.height = height;

        // draw the img into canvas
        ctx.drawImage(this, 0, 0, width, height);

        // Run the callback on what to do with the canvas element.
        callback(canvas, liElm);
    };

    img.src = url;
}

// List of imgur images
var images = ['u0s09PV', 'bdR1P3o', 'o7lwZ0', 'wv0jdUJ', 'D01sDQz', 'sB46sHZ', 'nvRcyJM'],
    imagesList = document.getElementById('imagesList');
```