

Asynchronous Module Definitions (AMDs)

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Introduction

- **JavaScript lacks any way to have external references**
 - No `using` statement like C#
 - **How do you specify code blocks that rely on other blocks?**
 - **How do you prevent scope leakage?**
 - **JavaScript is blocking, only one file can be processed at any given time**
 - Browsers will only download one at a time
 - **What about Node.js?**
 - It doesn't need to download files like a browser
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CommonJS

- **An attempt to standardize common JavaScript patterns**
 - **Most patterns have several proposals**
 - **Attempts to be generic for all JavaScript run times (browsers, server-side, etc)**
 - **Has a definition for Modules, currently at version 1.1.1**
 - Very similar to modules in Node.js
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Demo

Creating a Node.js module

RequireJS

- **A module framework in the browser**
 - **Doesn't implement CommonJS's Module pattern**
 - There's a problem for browsers, JavaScript is blocking so how can you do `require('some-module')`
 - **More browser-friendly API**
 - Supports Node.js as well
 - **Defines a structure as to how you should layout your files**
 - Uses conventions to perform lookups for dependencies
 - Caution – this can be problematic with combination & minification of dependencies
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Demo

Creating a AMD with RequireJS

Notes on ECMAScript vNext

- **Modules proposed for Harmony (ES vNext)**
- **New keywords and new syntax**
 - Wont be backwards compatible
- **Still under review**

ECMAScript vNext Module

```
module math {  
  export function sum(x, y) { return x + y; }  
  export var pi = 3.141593;  
}  
  
/* snip */  
  
import {sum, pi} from math;  
alert("2 $\pi$  = " + sum(pi, pi));
```


Recap

- **Modules bring structure to JavaScript development**
 - **Node.js uses CommonJS pattern**
 - `require('foo')` to load a module
 - `module.exports` to expose functionality
 - **Require.js for browser-based modules**
 - Slightly different from CommonJS
 - `require` takes an array of dependencies and a callback
 - `define` takes an array of dependencies and exposes an API
 - **ECMAScript vNext is bringing language support**
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