

NODE.JS MODULES

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Node.js Module System

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- Node.js standard library organized into modules
- A package is one or more modules grouped for distribution
- Package Manager: npm
 - ▣ Installs packages hosted at [npmjs.org](https://www.npmjs.org)

Package Locations

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- Packages can be installed locally or globally
- Local install:
 - ▣ `npm install packagename`
 - ▣ Installs module into `node_modules` subdirectory of current working directory
- Global install:
 - ▣ `npm install -g packagename`
 - ▣ Installs module into shared location
 - Windows: In `user_profile_directory\AppData\Roaming\npm`
 - ▣ Packages containing command line tools should be installed globally so their tools will be in the PATH

Installed Packages

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- Display installed packages:
 - ▣ npm ls
 - Displays Local packages
 - ▣ npm ls -g
 - Displays Global packages
- Update packages:
 - ▣ npm update *packagename* [-g]
- Uninstall packages:
 - ▣ npm rm *packagename* [-g]

Using Modules in Programs

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- Use `require()` to import code from installed modules

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

- Search order:
 1. Core modules compiled into Node.js
 2. `node_modules` folder in current directory
 3. `node_modules` folder in parent directories

Using Modules in Programs

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- `require()` can specify path to module

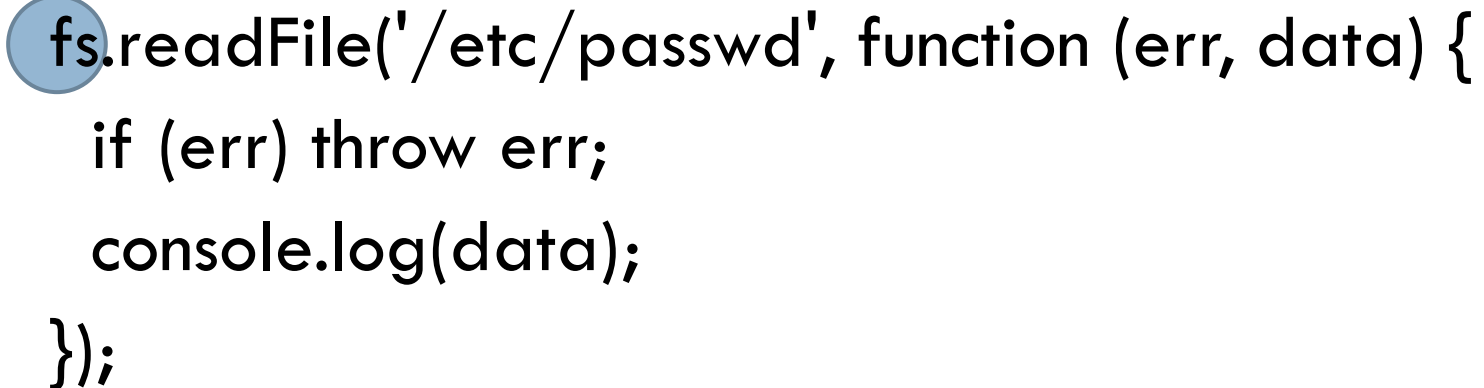
```
var mymodule = require('./mymodule');
```

- ▣ Looks for module in `./mymodule` (rather than in `./node_modules/mymodule`)

Using a Module

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



```
fs.readFile('/etc/passwd', function (err, data) {  
  if (err) throw err;  
  console.log(data);  
});
```

- The object returned from `require()` is used to invoke functions defined in the module

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Creating Modules

Module Structure

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- A Node.js module is a folder that contains a collection of JavaScript files and other resource files
- A config file named `package.json` specifies info about the module

□ Minimal example:

```
{  
  "name": "package-name",  
  "version": "0.0.0"  
}
```

package.json

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- Module entry point:
 - ▣ "main": "index.js"
 - ▣ Specifies the file to be loaded when module is requested with `require()`
 - ▣ Default is `index.js`

index.js

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- May define variables and functions
- Variables and functions are private to the module
- To export a function, assign it to a property of a predefined variable named **exports**
 - ▣ In scripts that `require()` the module, **exports** is returned from `require()`

Module Example

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- `./mymodule/index.js`

```
exports.hello = function() {  
  console.log("You called me!");  
}
```

- `./demo.js`

```
mymodule = require("./mymodule");  
mymodule.hello();  
// invokes hello in mymodule
```

Module Example

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- See `examples/nodejs/module_demo`