TYPESCRIPT 2.0 SETUP

Revision History

Date	Version	Description	Author
2016/10/24	1.0	Typescript Installation	Murugan_Nagarajan

Table of Contents

Typescript 2.0

Official Page: https://www.typescriptlang.org/

1. Introduction

This document describes about the steps involved in how to install & setup Typescript 2.0 plugin in eclipse and compile/execute a sample TS file by creating a sample web project. Currently this document just provides the basic idea of Typescript and how to install it in your system, just a basic way to startup with a simple Typescript based project in your system.

So why the version 2.0 which was available from Sep 22, 2016, interested in knowing the history of Typescript please refer to the below wiki page if required. https://en.wikipedia.org/wiki/TypeScript

2. What is Typescript?

JS which is being currently used in all the web application is one of the implementation of specification of ES5 or Ecmascript5 and is supported by all browsers in all platforms till now. Later in 2015, ES2015/ES6 standards are introduced with additional updates and required features of an Object Oriented language on top of ES5 which required a better scripting language which can be used at both client & server side.

3. Why Typescript?

- Being an updated version of ES5 standard/superset of JS with backward compatibility any existing applications using JS will be able to run without any issues when added/updated with Typescript support.
- Class based Object Oriented Programming concepts makes design& development easier than JS.
- Compile Time error checks adds additional easy to avoid typos and incorrect assumptions of data type of a variable.
- When used with valid IDE like MS Visual Studio, Eclipse, Sublime typescript plugins are also provided with the feature of content assist/autocomplete which boosts the productivity involved in respect client side scripting.

4. Node JS - NPM

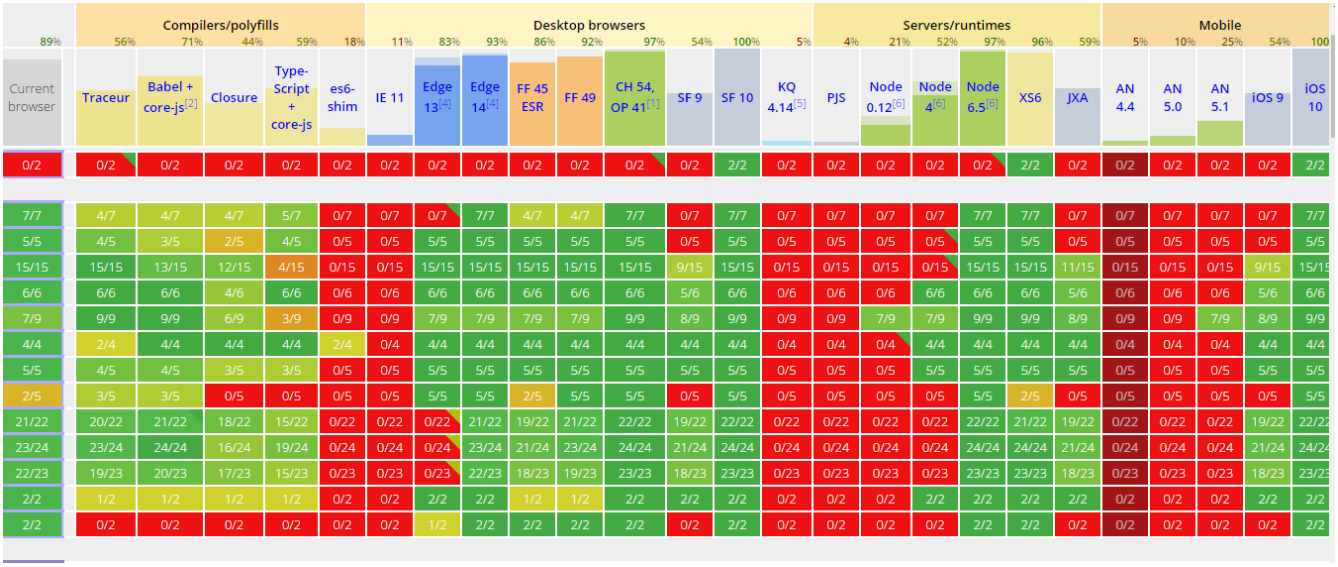
Node Package Manager which comes as a part of Node JS installation currently, is mainly useful for JavaScript developers to share and reuse code and also to update the code that is being shared with others. This is achieved by the concept of Modules/Modular programming which is just similar to the packaging concept of JAVA/header files in C#.

Thus Node.js & NPM is required as a pre-requisite of Typescript installation.

5. The Term 'Transpiler'

Before diving into the steps involved let's discuss about one more terminology "Transpiler".

You may be aware of that any browser can work/interpret JS code to generate or access the DOM elements in the HTML file, but not a Typescript file. So we need to convert/compile a strictly typed Typescript code/file into a JavaScript code/file which will be injected in the HTML using SCRIPT tags. This process is called **Transpilation** which can be achieved using any IDE with Typescript supporting plugins or even in a command prompt once typescript is installed. Transpilation can be configured in such a way that you can convert a TS file which is of ES6 standard to ES5/ES3 standards depending on the requirement. And why this is needed because most of the current web browsers version are not yet updated to support ES6 standard. Only IOS10 & SF10 are having 100% support for ES6 while nightly versions of Chrome & Firefox are runners with ~95%.



	Compilers/polyfills					Desktop browsers								Servers/runtimes						Mobile				
89%	56%	71%	44%	59%	18%	11%	83%	93%	86%	92%	97%	54%	100%	5%	4%	21%	52%	97%	96%	59%	5%	10%	25%	54%	100
Current browser	Traceur	Babel + core-js[2]	Closure	Type-Script + core-js	es6-shim	IE 11	Edge 13[4]	Edge 14[4]	FF 45 ESR	FF 49	CH 54, OP 41[1]	SF 9	SF 10	KQ 4.14[5]	PJS	Node 0.12[6]	Node 4[6]	Node 6.5[6]	XS6	JXA	AN 4.4	AN 5.0	AN 5.1	iOS 9	iOS 10
0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	2/2	0/2	0/2	0/2	0/2	0/2	2/2	0/2	0/2	0/2	0/2	0/2	2/2
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2/2	0/2	0/2	0/2	0/2	0/2	0/2	1/2	2/2	2/2	2/2	2/2	0/2	2/2	0/2	0/2	0/2	0/2	2/2	2/2	0/2	0/2	0/2	0/2	0/2	2/2

Please refer to the below link for details about this compatibility check data.
http://kangax.github.io/compat-table/es6/

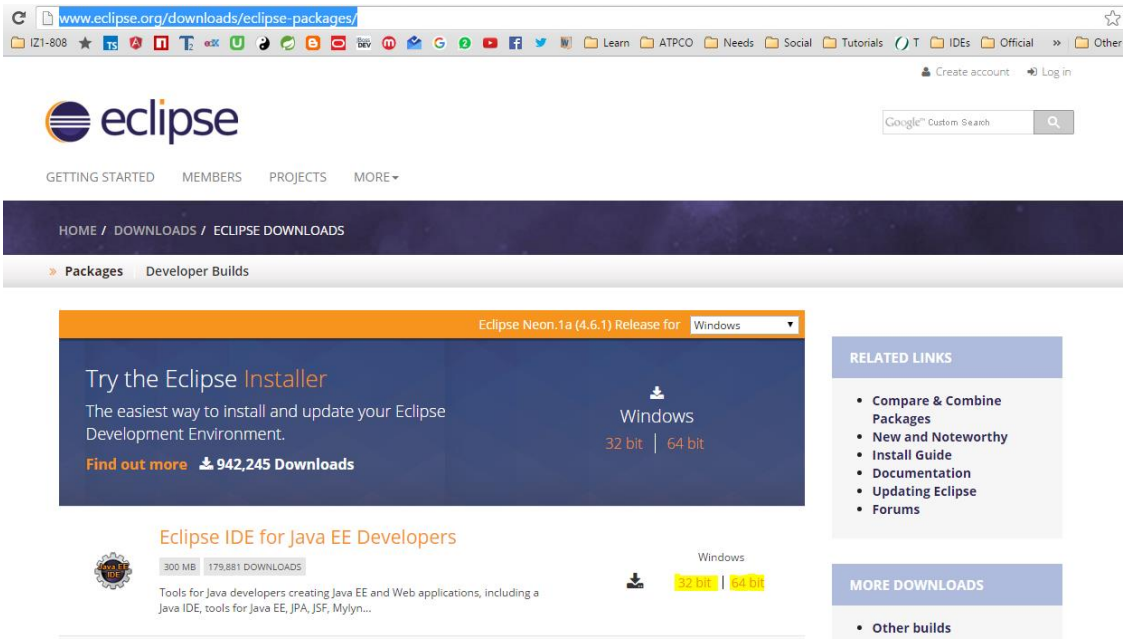
6. STEPS Involved to SETUP:

Instead of just providing each steps point by point, we have provided the screenshot of those steps while setting up the Eclipse IDE with Typescript support plugin at the same time of drafting this document.

Step 1: Eclipse Installation/Download

This is a well-known step to all the developers, however if you need to update your current eclipse version to the latest one please follow as below. You may not be able to install the eclipse installer exe in Infosys machine so better download the package from the below path. (32 bit/64 bit package – depends on your system)
http://www.eclipse.org/downloads/eclipse-packages/

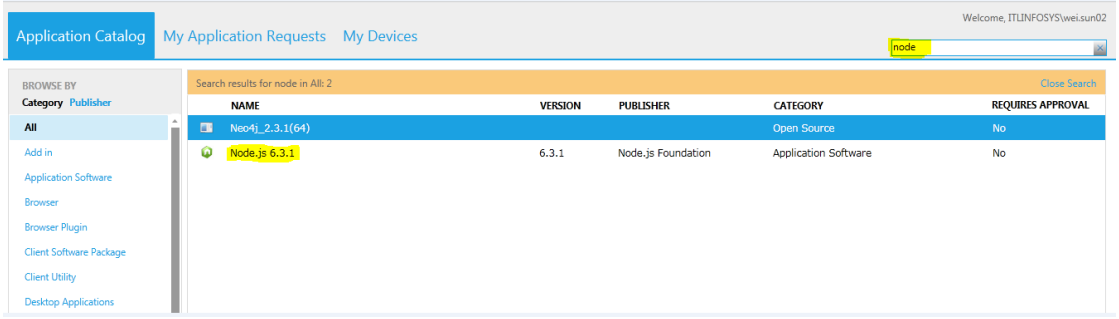
Note: All the required IDE, JDK & NODE JS Tools are also available in our Infosys LAN path below,
\\prcsgings02\ATPDDSCH\daily\Work Area\Common\ATPCOArch2.0\SoftwaresAndTools

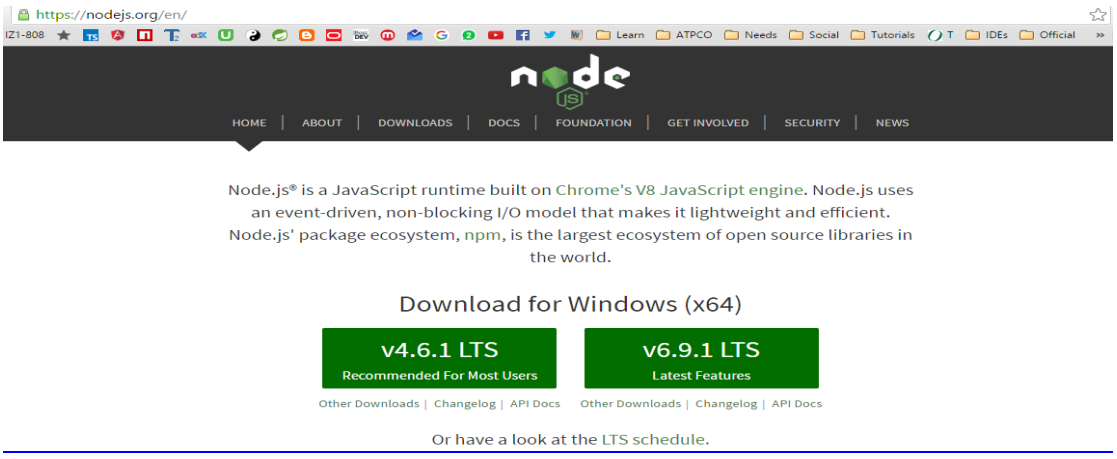


Then extract the downloaded zip file eclipse-jee-neon-1a-win32-x86_64.*zip in the folder of your choice. Here we extracted it to* **D:\ProgramFiles\eclipse-neon**
Note: Eclipse-Neon: current latest version requires JRE/JDK 8 installed in your system.

Step 2: Node JS download

Download the stable/latest Node.js version from the official page https://nodejs.org/en/ if you have admin access or install it from our Infosys Software House link provided here http://prcsgisccmpri/CMApplicationCatalog/#/SoftwareCatalog

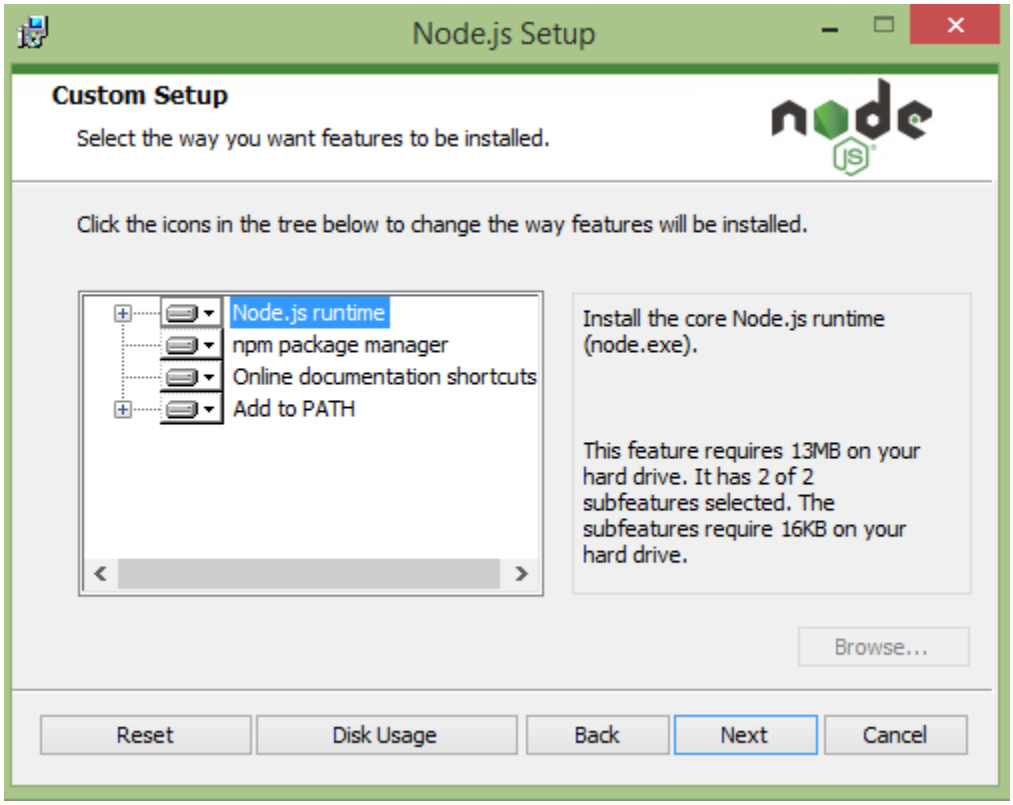




Step 3: NPM & Node JS installation

Execute the node-v4.6.1-x64.msi file retrieved from the above download.

1. Installation of NODEJS is pretty straight forward.
2. Double click the above mentioned node msi file.
3. Accept the License Agreement.
4. Mention the installation directory of your choice. (Say: D:\Program Files\nodejs\)
5. Make sure that NPM manager is also installed along with NODEJs runtime as shown.



Step 4: Ensure that Installation is successful

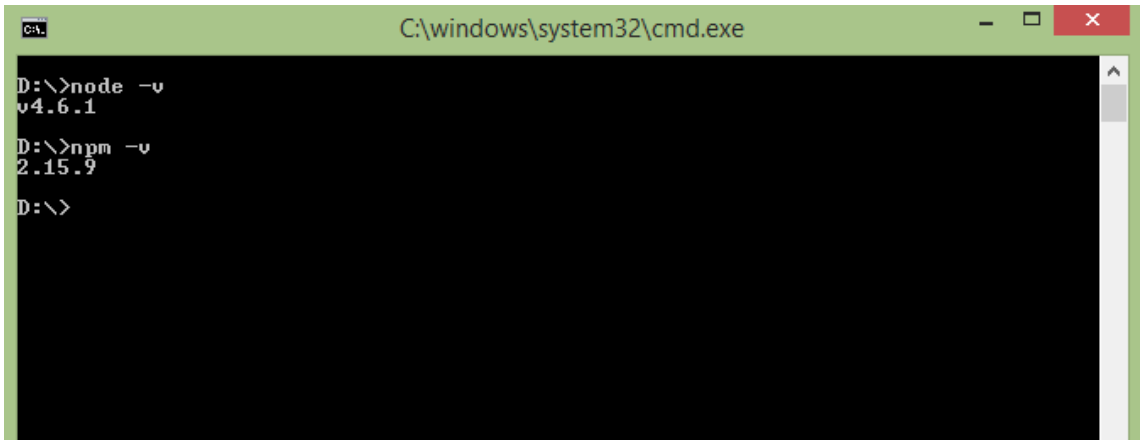
Once the installation is completed verify in the Control Panel - Environmental Variables, whether the NodeJS installation directory is added to Path property. Also additionally open command prompt and use the following commands to confirm that everything is installed correctly.

You can execute these cmd in any directory C: or D: drive doesn't matters.

CMD1: **node – v** should display the version of Node JS installed.

CMD2: **npm –v** should display the version of NPM installed.

Please follow up with your leads if you are facing any issue in the above mentioned steps so far.



Step 5: Typescript 2.0 Install – Using NPM

With NPM being installed properly now you will be able to install Typescript or any other required JS modules based on your need. Let's see how to install TS from cmd prompt and later we can move to Typescript plugins in Eclipse IDE.

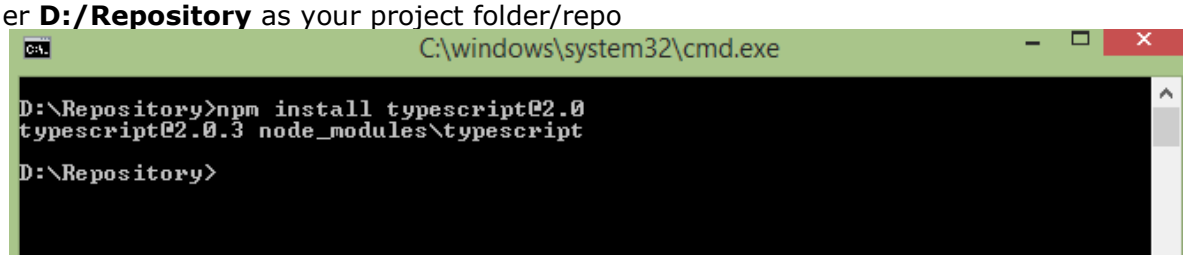
You need to run the below **cmd** to retrieve the required dependency file of TS.

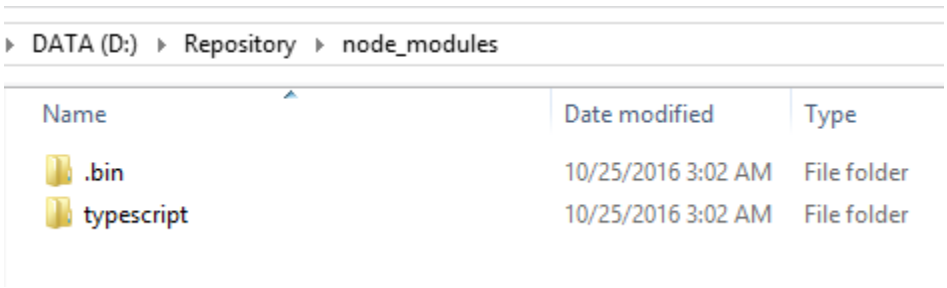
Also we have the option of installing the modules either locally or globally. So what's the difference here? Preferable to do global installation for Typescript.

Local *Installation:* The typescript modules will be installed in **node_modules** folder and they will be accessible only in the current directory/project in which you are installing.

```
npm install typescript@2.0
```

Consider **D:/Repository** as your project folder/repo

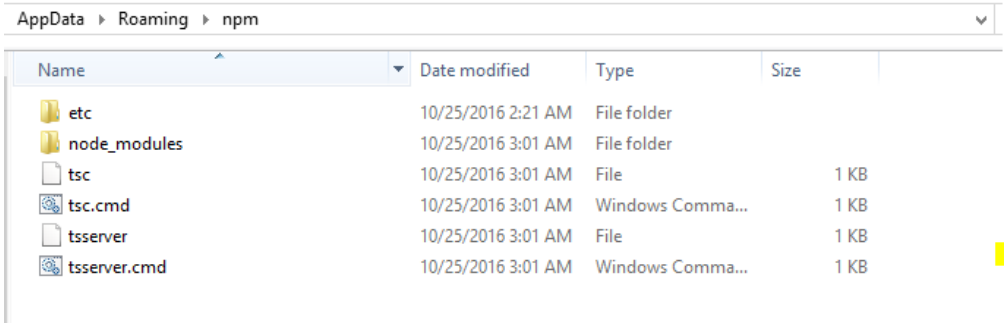




***Global** Installation:* The typescript modules being installed in **node_modules** folder which will be copied in **.../User/<current User>/AppData** folder.

```
npm install -g typescript --save
```
//Here –-save is optional.

Installing globally, the **node_modules** is downloaded in **.../user/AppData/Roaming/npm/** folder as shown in the screeshot below.



You may need to do the below proxy setup action items so that you can download/install the typescript modules from the external network.
Please refer to the below URL for details on this. http://wiki.ad.infosys.com/Npm

How to use Sinopia?

1. Repoint your registry to proxy server by issuing below command:

```
npm set registry http://infygit.ad.infosys.com:4873
```

2. Also remove any http / https proxy config that you may have for node. You may do this by following commands..
3. Inspect the node config via

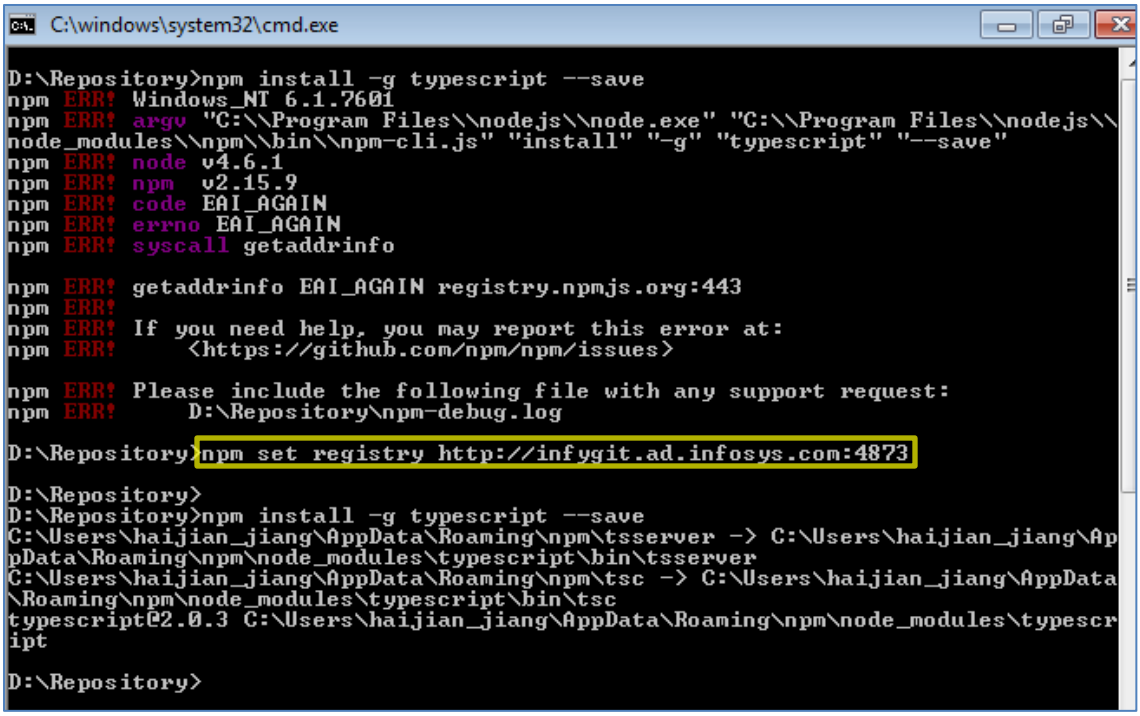
```
npm config get
```

4. if you see proxy / https-proxy configuration.. remove it.

```
npm config rm https-proxy
npm config rm proxy
```

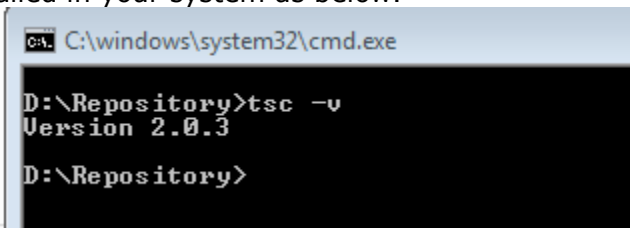
You may need to append `--global` to above commands if you have the proxy added to your global npm config.

1. Execute the command to set the npm registry to 4873 port
   ```
   npm set registry http://infygit.ad.infosys.com:4873
   ```
2. Check the npm config details using
   ```
   npm config get
   ```
3. Remove the https-proxy / proxy if required.
   ```
   npm config rm https-proxy
   npm config rm proxy
   ```



Step 6: Ensure that Typescript Installation is Successful

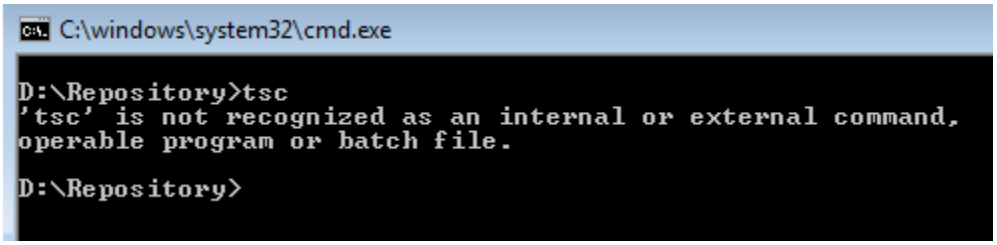
Now execute the command **`tsc -v`**, you should be able to see the current version of typescript installed in your system as below.

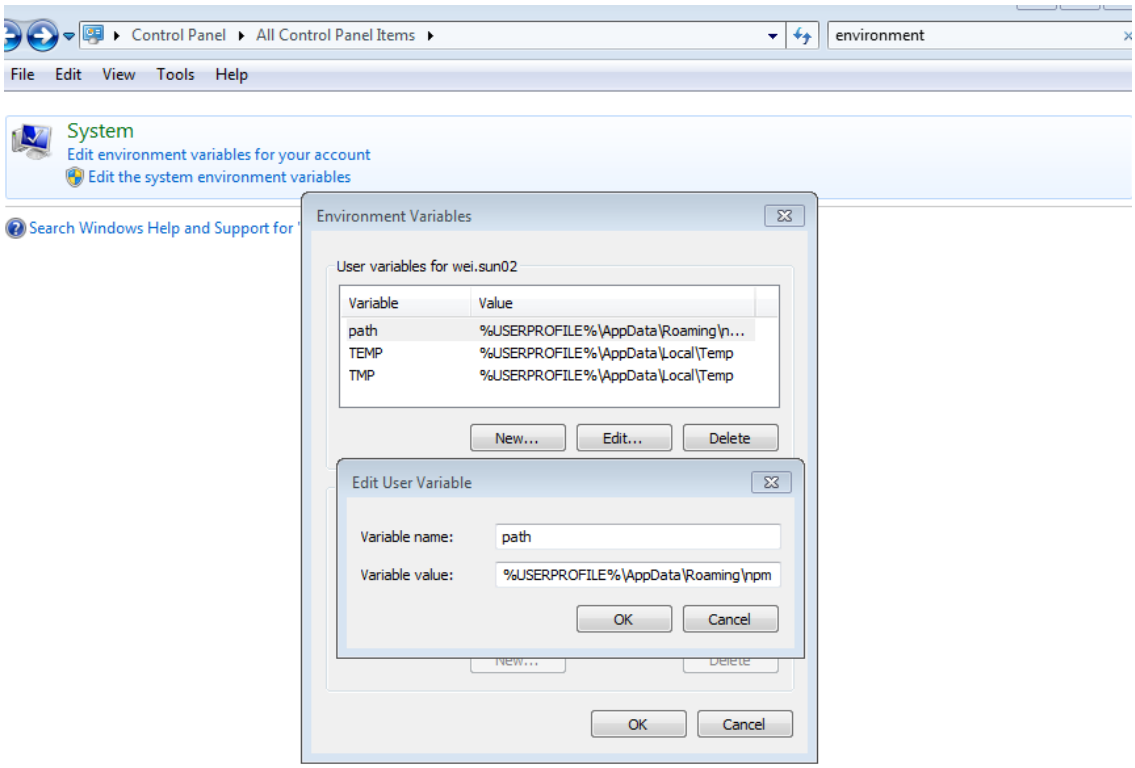


If you are facing any issues stating 'tsc' is not recognized as a valid command, then please navigate to, Control Panel -> Search for "Environment variable" ->

Add/Update the path parameter as **%USERPROFILE%\AppData\Roaming\npm**

Note: Provided <User Directory>/AppData/Roaming/npm is the location where the node-modules are downloaded.



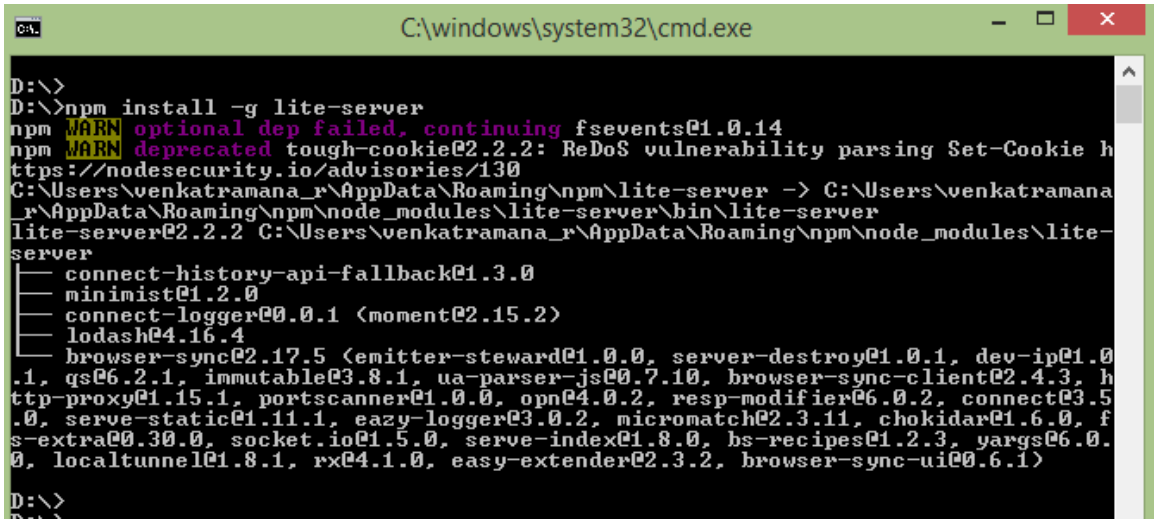


Step 7: LITE-Server installation - Optional

As mentioned in the header this is a light weight client side web server which can be used to accept HTTP requests thereby used to deploy and view the outcome of the JavaScript file transpiled from a TS file. We will describe how to do that in Step 9. As of now we will just install this lite-server using npm and try to start the server and confirm if it runs properly.

Execute the below command line in cmd prompt.

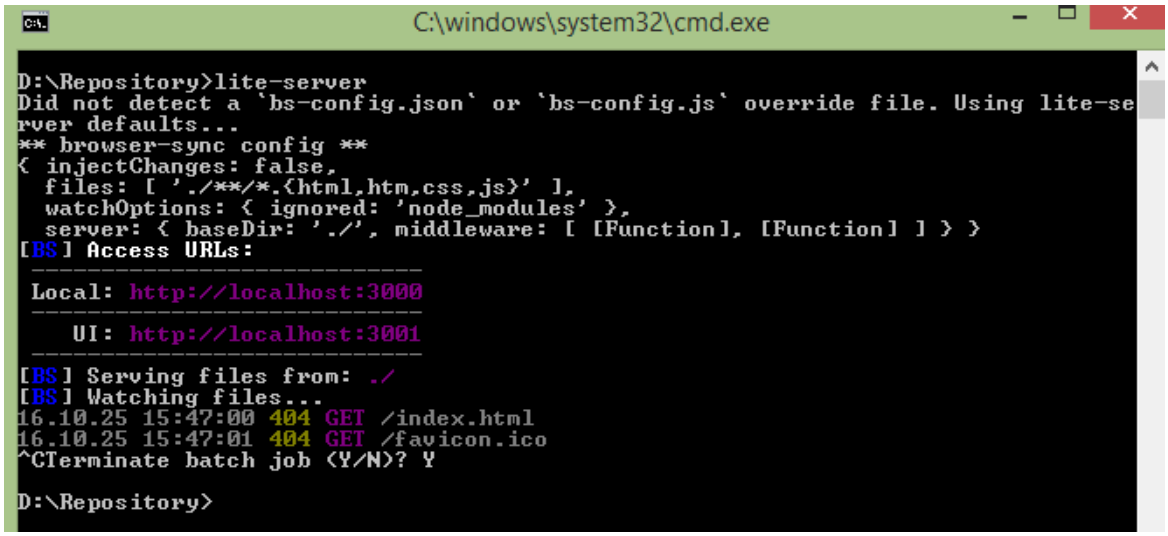
```
npm install -g lite-server --save
```



Then you can start the **lite-server** in command prompt as shown below.

The default browser window opens automatically redirected to http://localhost:3000 and displays any index.html file available in the Repo/Project folder in which the server is started.

Press CTRL + C and Enter Y to terminate/stop the lite-server.



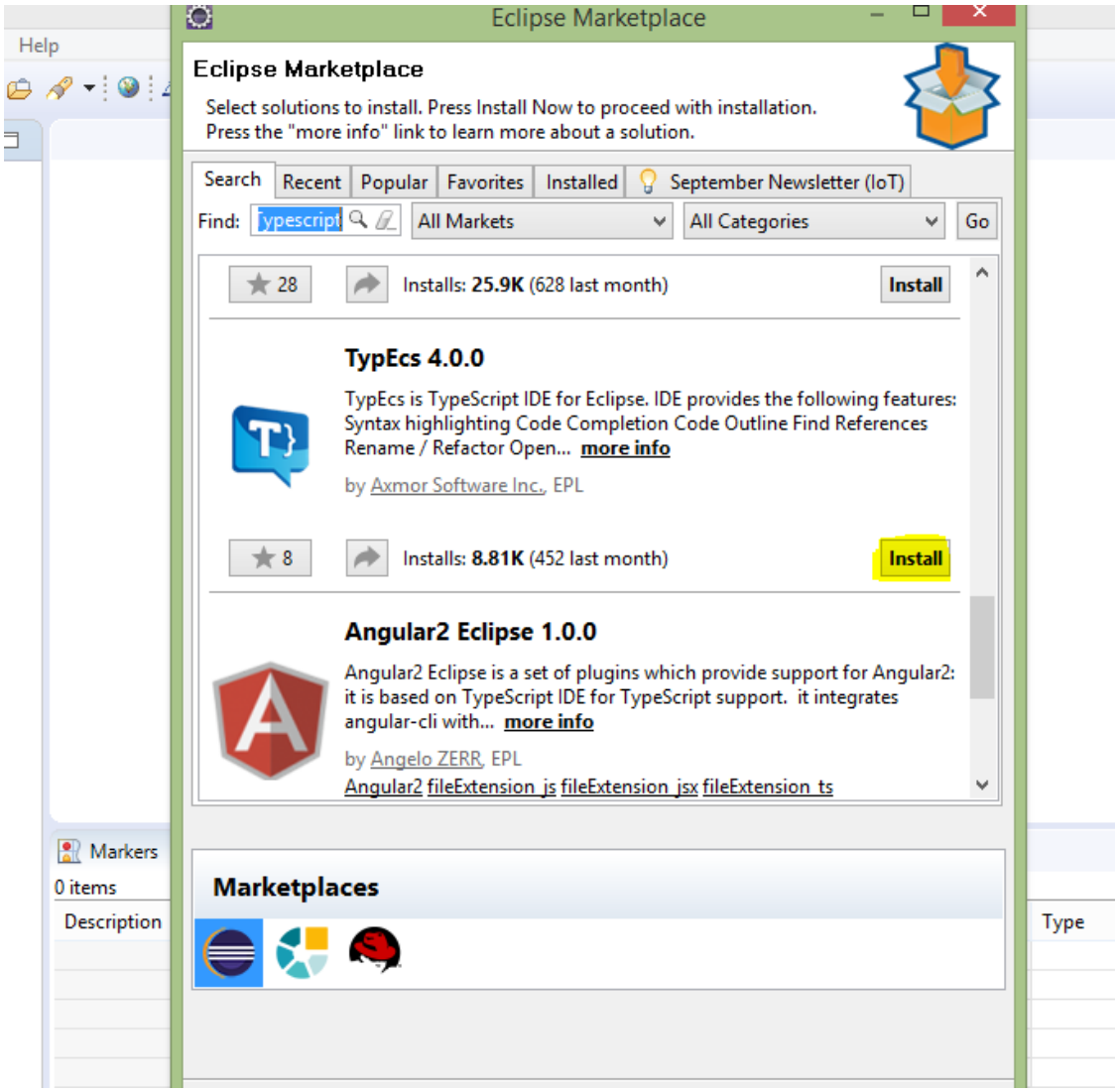
Step 8: Typescript Plugin for Eclipse

There are different ways of compiling TS files.

- ✓ Making use of Typescript playground available in TS official web page t t
- ✓ Using simple text editors like Notepad++ to draft the TS files and make use of **tsc** command along with **–watch** option to compile & transpile TS files. Not preferable for developing web application projects.
- ✓ Using Text editors like Sublime Text is a light weight editor which can be used with TS plugin and acts as powerful IDE to transpile & compile TS files
- ✓ Using MS Visual Studio –with inbuilt TS plugin is mostly preferred by .NET developers and Studio requires commercial licenses.
- ✓ Eclipse IDE which was preferred by JAVA developers when installed with plugins like **TypEcs**, **Typescript IDE & Enide** available in its marketplace will be highly useful to develop web applications using TS.

Let configure the Eclipse Neon installed in STEP1 to support Typescript by adding the required plugins.

Navigate to Help -> Eclipse Marketplace – Search for 'TypEcs' plugin –Then click **Install**

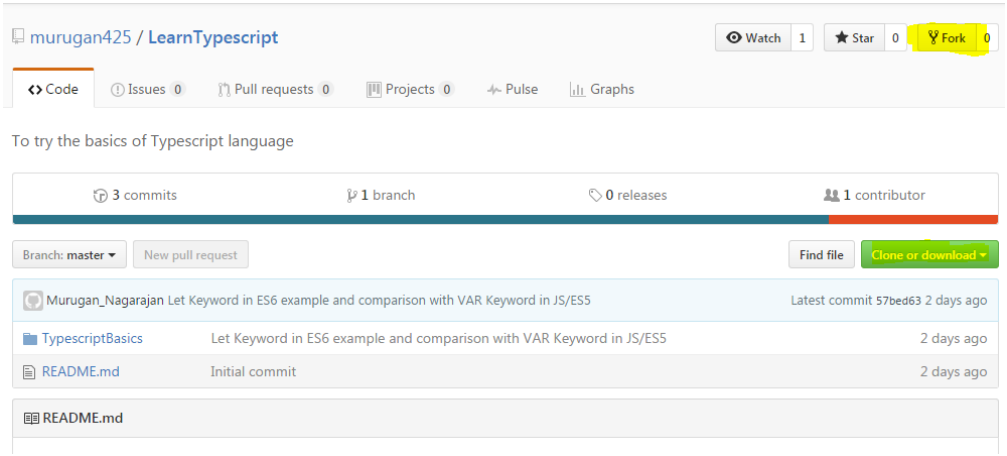


Once the TypEcs plugin is installed please restart the eclipse. Then, you should be able to see the below section in your Eclipse -> Window -> Preferences

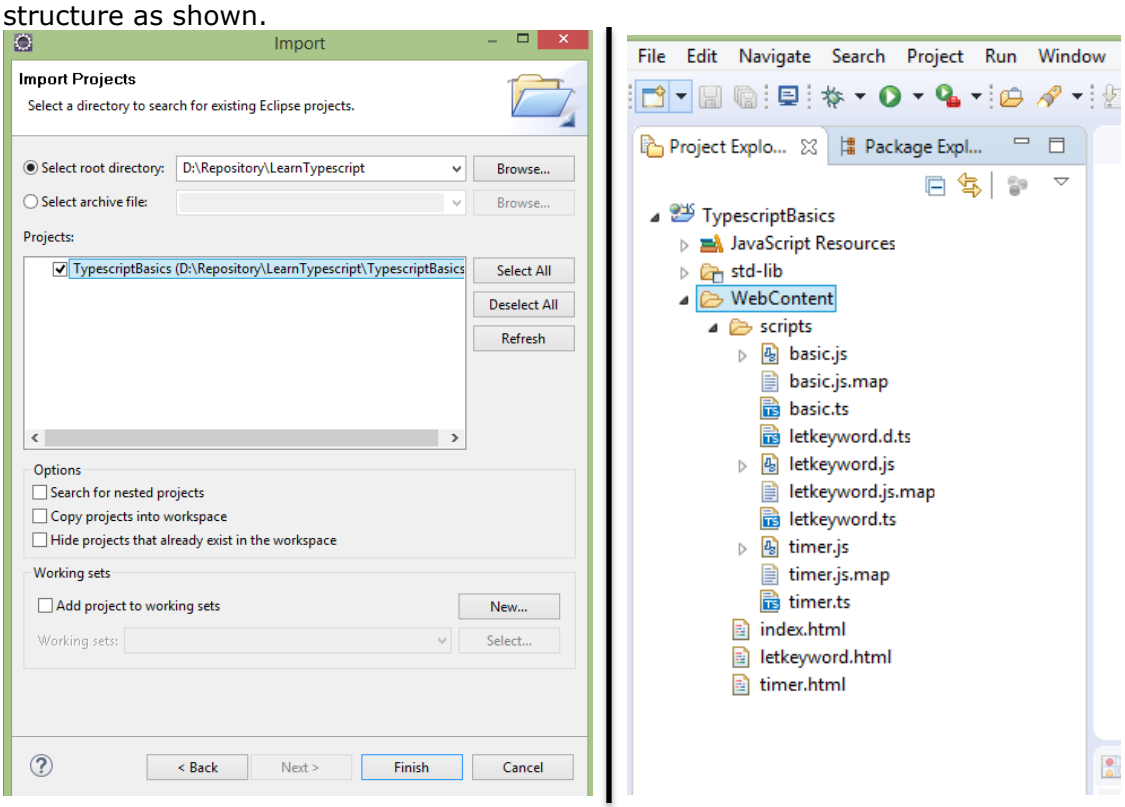
Step 8: Transpile TS files to JS files in Eclipse

With the Typescript setup being completed, let's try to create static web project in which we will transpile a TS file to JS file and view the output in default browser by running the lite-server.

1. Either create a new Static Web Project or import the existing TS sample project source code from the below GITHub Repo. Here we are using an existing project as an example. https://github.com/murugan425/LearnTypescript
2. Download the project as zip file and import it to your eclipse or fork & clone it if you are aware of how to do it in GitHub

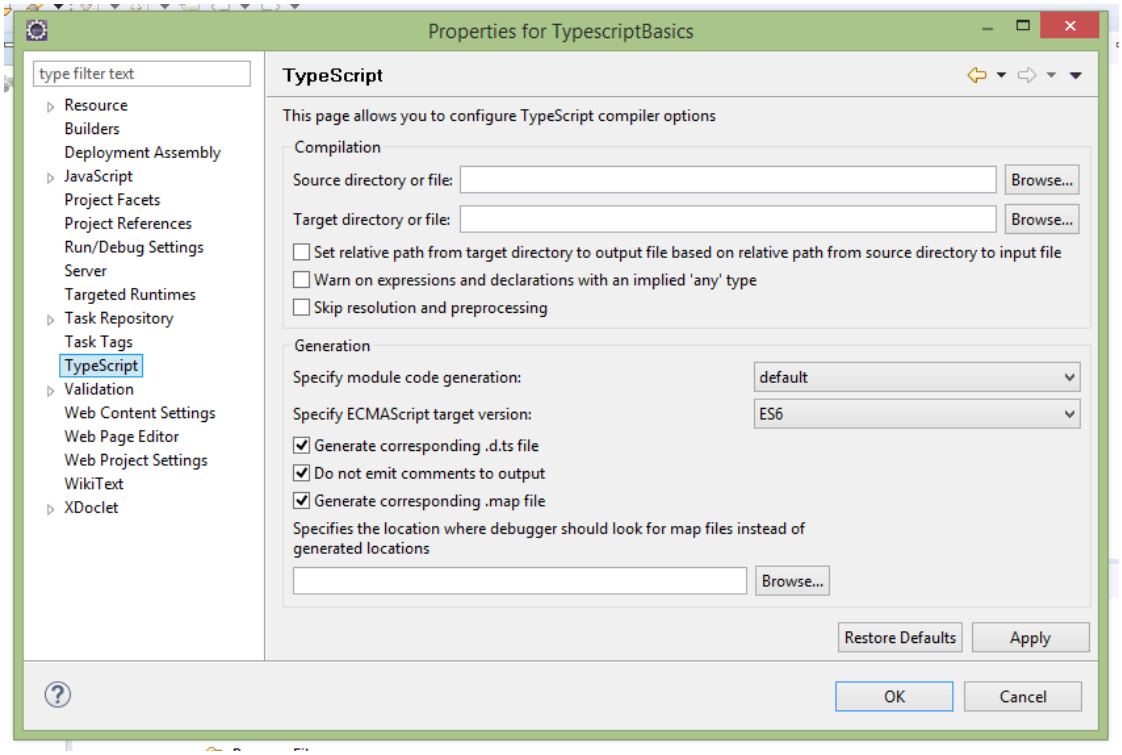


3. Extract the zipped file & Import the project. You should get a project source code structure as shown.



4. Right Click the Project -> Goto Properties -> Typescript
   You will be able to configure the,
   - ✓ Source Directory of TS files,
   - ✓ Output Directory of JS files,
   - ✓ Enable/Disable Generating .map , .d.ts/header files,
   - ✓ Specify the target ES version based on your requirement.

   All these configuration are nothing but the Typescript compiler options of the in-built Typescript plugin installed.



5. You can start creating your own TS files and the corresponding JS files will be generated.
6. Include these files using <script> tags in index.html or any html files of your choice.
7. Next, run the lite-server in your project folder location to view the output in the default browser as shown below.
8. And the lite-server comes with –watch/browser sync enabled by default so any change you do in TS/JS files and save these files will be reflecting in the browser immediately.