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## 1 – Introduction :

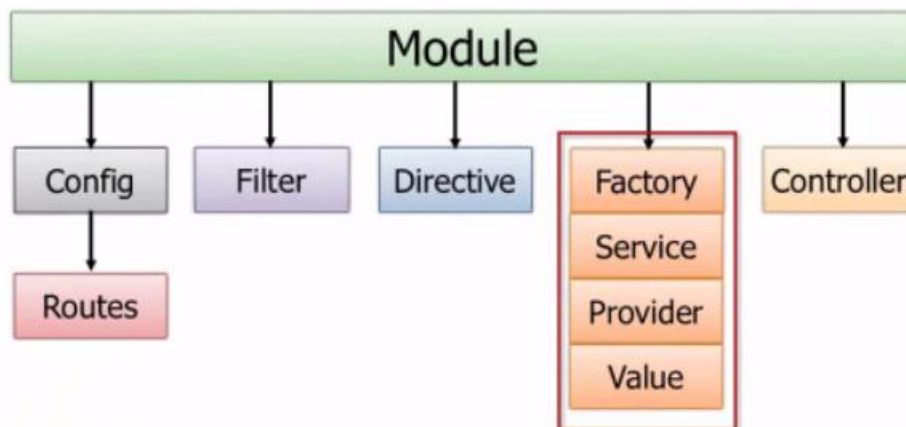
Angular JS is available in version 1.2 and version 2 which is the latest and it is a complete rewrite of the previous version. Angular JS allows us to manipulate the DOM of a browser using directives provided by Angular. Angular provides a scope object that contains properties and methods that are shared between the HTML5 Views and the javascript based Controllers.



The neat thing about Angular is that you can define an Application that you would like to create and then divide it up into modules and assign controllers for the various modules. This promotes code reuse as you can neatly place all your javascript code into separate js files.

In Angular we typically retrieve JSON data using a get or put command provided by the \$http service. There are 30 services provided by the Angular library out of the box to do common things. For example the \$location service can be used to provide the device location APIs for an application. Besides the core Angular library there are many other libraries that are available that are very useful like the angular grid js library for displaying grid / list data.

Angular provides separation of concerns, we can manipulate the windows object in Angular using the directives provided by the library. We can also filter the data and sort it and there are a lot of data binding mechanisms available where we can use ng-model to create scope level variables that get shared with a controller and from there they can be written out to the database using direct \$conn service based connection objects provided by Angular or using json service based web API calls of ASP.NET. Angular can coexist very easily with an MVC project and it can use the get / put end points of an MVC application to get or save data using Angular Services. We can define routes and other things as shown in the diagram below.



## 2 – Setup Development Environment for Angular :

Angular JS is a cross platform development library. It can be used on IOS or a windows machine. On a macbook you would typically use Angular JS along with a scripting language like

PHP with a framework like CakePHP etc. On a windows environment you can just download one of the startup solutions available from angular website for setting up angular to work with ASP.NET MVC 5. The link below should provide all the information.

<https://angularstart.codeplex.com/releases/view/119501>

Also we can setup VSIX Visual Studio Templates to create angular js. The Visual Studio Gallery has many of these templates available.

<https://visualstudiogallery.msdn.microsoft.com/5af151b2-9ed2-4809-bfe8-27566bfe7d83>

To start using Angular all you have to do is include a link to the library and you are ready to use it. You may also use a package manager to install it in Visual Studio. It is best to use Visual Studio 2015 but you can use Visual Studio 2012 and 2013 also.

Node JS can also be configured to run alongside Angular if you would like to build more realtime applications that are more interactive. However it is best to add only the libraries that you will use to make sure the solution runs fast.

### 3 – Features :

Angular JS extends HTML with new attributes. It provides a new way of DOM manipulation. Here is a list of features provided by Angular :

1. Expressions – They are written in the binding syntax `{{name}}`
2. Modules – Created by using `angular.module` syntax
3. Directives – Like `ng-init` to initialize variables on a page
4. Model – The `ng-model` attribute is used to setup observable business objects
5. Controllers – `ng-controller` to store javascript functions and logic.
6. Scope – The scope is the binding part between the HTML (view) and the JavaScript (controller). It contains properties and methods and it is at the heart of all the event driven communication between the view and the controller.
7. Services – Forexample `$location`, `$timeout`, `$http` etc. These services provide data access and many other important apis.
8. Forms – Data bind the html elements to the controllers. Trigger events that are handled in code behind javascript controllers. Validation is also provide on the form to check for number or text etc values.
9. Filter – Have the following attributes that can be used.

|           |           |        |         |
|-----------|-----------|--------|---------|
| currency  | date      | filter | json    |
| limitTo   | lowercase | number | orderBy |
| Uppercase |           |        |         |

## 4 – Angular.js :

Topics are directives, services, filters, providers, types, global APIs and testing mocks.

| Functions ( use Angular.* syntax to call) |            |          |          |           |             |
|---|------------|----------|----------|-----------|-------------|
| bind                                      | bootstrap  | copy     | element  | equals    | extend      |
| forEach                                   | fromJson   | identity | injector | isArray   | isDefined   |
| isElement                                 | isFunction | isNumber | isObject | isString  | isUndefined |
| lowercase                                 | module     | noop     | toJson   | uppercase |             |

| Directives     |             |             |                |               |              |
|----------------|-------------|-------------|----------------|---------------|--------------|
| a              | form        | input       | ngApp          | ngBind        | ngBindHtml   |
| ngBindTemplate | ngBlur      | ngchanged   | ngChecked      | ngClass       | ngClassEven  |
| ngClassOdd     | ngClick     | ngCloak     | ngController   | ngCopy        | ngCSP        |
| ngCut          | ngDbclick   | ngDisabled  | ngFocus        | ngForm        | ngHide       |
| ngHref         | ngIf        | ngInclude   | ngInit         | ngKeydown     | ngKeyPress   |
| ngKeyup        | ngList      | ngModel     | ngModelOptions | ngMouseDown   | ngMouseenter |
| ngMouseleave   | ngMouseMove | ngMouseover | ngMouseup      | ngNonBindable | ngOpen       |
| ngPaste        | ngPluralize | ngReadonly  | ngRepeat       | ngSelected    | ngShow       |
| ngSrc          | ngSrcset    | ngStyle     | ngSubmit       | ngSwitch      | ngTransclude |
| ngValue        | script      | select      | textarea       |               |              |

| Types             |                                |                     |                           |
|-------------------|--------------------------------|---------------------|---------------------------|
| angular.Module    | \$CacheFactory.Cache           | form.FormController | ngModel.ngModelController |
| \$rootScope.Scope | \$compile.directive.Attributes |                     |                           |

| Services           |            |                |                 |               |               |
|--------------------|------------|----------------|-----------------|---------------|---------------|
| \$anchorScroll     | \$animate  | \$cacheFactory | \$compile       | \$controller  | \$document    |
| \$exceptionHandler | \$filter   | \$http         | \$httpBackend   | \$interpolate | \$interval    |
| \$locale           | \$location | \$log          | \$parse         | \$q           | \$rootElement |
| \$rootScope        | \$sce      | \$sceDelegate  | \$templateCache | \$timeout     | \$window      |

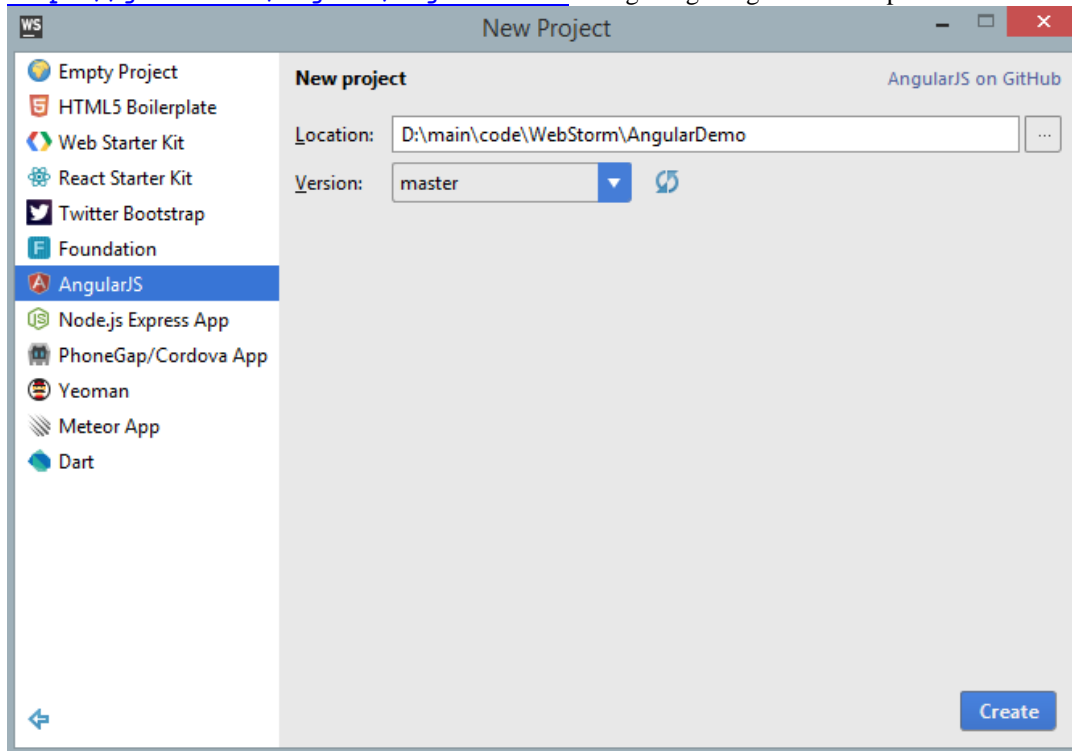
| Providers          |                   |                      |                     |                       |
|--------------------|-------------------|----------------------|---------------------|-----------------------|
| \$animateProvider  | \$compileProvider | \$controllerProvider | \$filterProvider    | \$interpolateProvider |
| \$locationProvider | \$logProvider     | \$parseProvider      | \$rootScopeProvider | \$sceDelegateProvider |
| \$sceProvider      |                   |                      |                     |                       |

| Filters  |         |           |      |         |           |
|----------|---------|-----------|------|---------|-----------|
| currency | date    | filter    | json | limitTo | lowercase |
| number   | orderBy | Uppercase |      |         |           |

| Miscellaneous Things |           |            |           |         |            |
|----------------------|-----------|------------|-----------|---------|------------|
| ngRoute              | ngAnimate | ngResource | ngCookies | ngTouch | ngSanitize |
| ngMock               |           |            |           |         |            |

## 5 – Development Tools and Angular Project Directory Layout :

Visual Studio 2015 or WebStorm can be used to build Angular Applications. The Angular Seed project located at <https://github.com/angular/angular-seed> is a good getting started sample.



## Directory Layout

```

app/                --> all of the source files for the application
app.css            --> default stylesheet
components/        --> all app specific modules
  version/         --> version related components
    version.js     --> version module declaration and basic "version" value service
    version_test.js --> "version" value service tests
    version-directive.js --> custom directive that returns the current app version
    version-directive_test.js --> version directive tests
    interpolate-filter.js --> custom interpolation filter
    interpolate-filter_test.js --> interpolate filter tests
  view1/          --> the view1 view template and logic
    view1.html    --> the partial template
    view1.js      --> the controller logic
    view1_test.js --> tests of the controller
  view2/          --> the view2 view template and logic
    view2.html    --> the partial template
    view2.js      --> the controller logic
    view2_test.js --> tests of the controller
app.js            --> main application module
index.html        --> app layout file (the main html template file of the app)
index-async.html --> just like index.html, but loads js files asynchronously
karma.conf.js     --> config file for running unit tests with Karma
e2e-tests/       --> end-to-end tests
  protractor-conf.js --> Protractor config file
  scenarios.js     --> end-to-end scenarios to be run by Protractor

```

### 6 – Code Snippets :

Some C# code snippets that are useful

```
// Simple Example
```

```

<!DOCTYPE html>
<html lang="en-US">
<script src="http://ajax.googleapis.com/ajax/libs/angularjs/1.4.8/angular.min.js">
</script>
<body>

<div ng-app="">
  <p>Name : <input type="text" ng-model="name"></p>
  <h1>Hello {{name}}</h1>
</div>

</body>
</html>

```

```
// Simple Controller
```

```
<div ng-app="myApp" ng-controller="myCtrl">
```

```
First Name: <input type="text" ng-model="firstName"><br>
```

```
Last Name: <input type="text" ng-model="lastName"><br>  
<br>
```

```
Full Name: {{firstName + " " + lastName}}
```

```
</div>
```

```
<script>
```

```
var app = angular.module('myApp', []);  
app.controller('myCtrl', function($scope) {  
    $scope.firstName = "John";  
    $scope.lastName = "Doe";  
});
```

```
</script>
```

Appendix :

<http://docs.angularjs.org/api/ng>

<https://github.com/shawnwilder/muth/wilderblog>

<https://github.com/chsakell/spa-webapi-angularjs>