Instructor No

Angular JS

Angular JS Services

People matter, results count.

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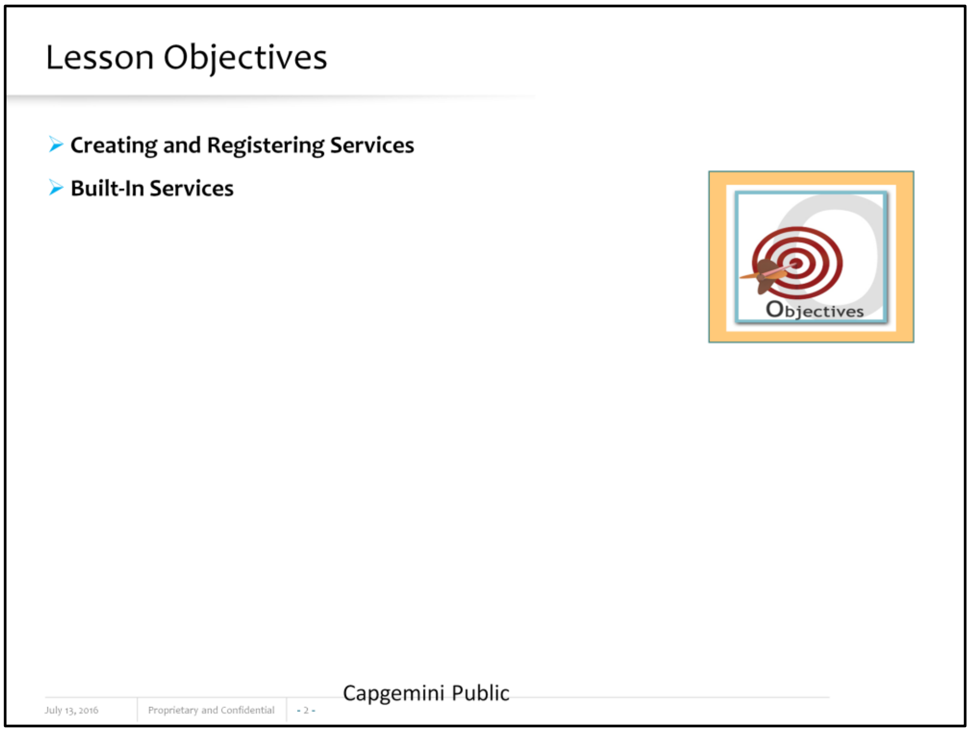

Lesson Objectives

- Creating and Registering Services
- Built-In Services

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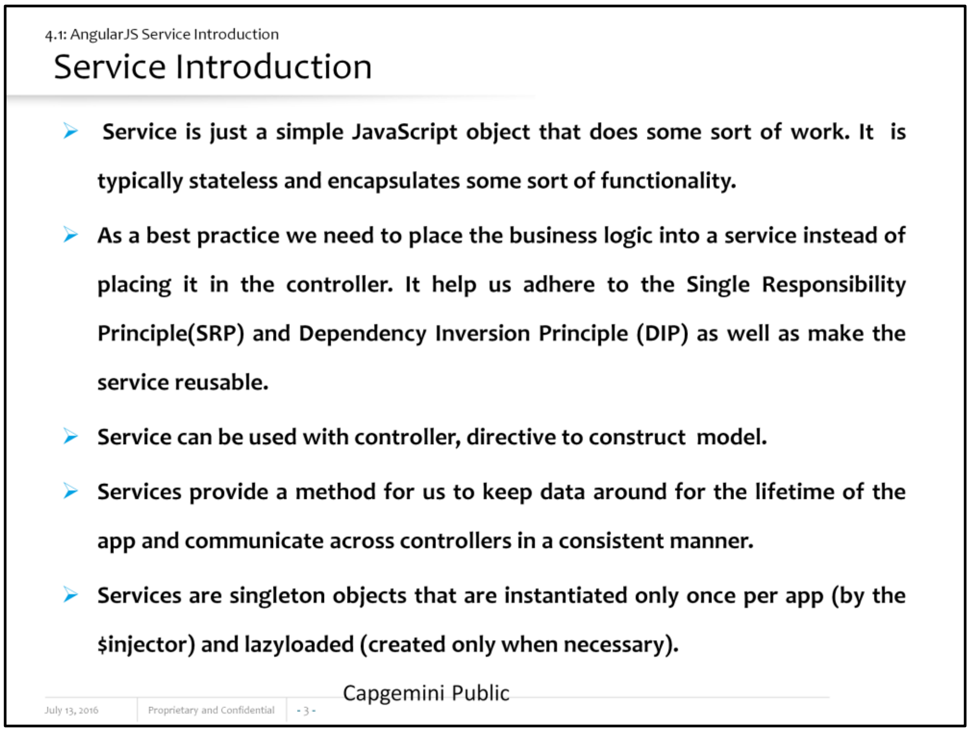

4.1: AngularJS Service Introduction

Service Introduction

- **Service is just a simple JavaScript object that does some sort of work. It is typically stateless and encapsulates some sort of functionality.**
- **As a best practice we need to place the business logic into a service instead of placing it in the controller. It help us adhere to the Single Responsibility Principle(SRP) and Dependency Inversion Principle (DIP) as well as make the service reusable.**
- **Service can be used with controller, directive to construct model.**
- **Services provide a method for us to keep data around for the lifetime of the app and communicate across controllers in a consistent manner.**
- **Services are singleton objects that are instantiated only once per app (by the $injector) and lazyloaded (created only when necessary).**

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Single Responsibility Principle teaches that every object should have a single responsibility. If we use the example of a controller, it’s responsibility is essentially to wire up the scope (which holds your models) to your view; it is essentially the bridge between your models and your views. If your controller is also responsible for making ajax calls to fetch and update data, this is a violation of the SRP principle. Logic like that (and other business logic) should instead be abstracted out into a separate service, then it can be injected into the objects that need to use it. This is where the Dependency Inversion Principle comes in.

The DIP states that objects should depend on abstractions, not concretions. In languages like C# and Java, this means your objects depend on Interfaces instead of Classes. In JavaScript you could look at any parameter of any function (constructor function or otherwise) as an abstraction, since you can pass in any object for that parameter so long as it has the members on it that are used within that method. But the key here is the ability to use dependency injection — the ability to inject into other objects. This means that all of your controllers, directives, filters and other services should take in any external dependencies as parameters during construction. This allows you to have loosely coupled code and has the added benefit of making unit testing much easier.

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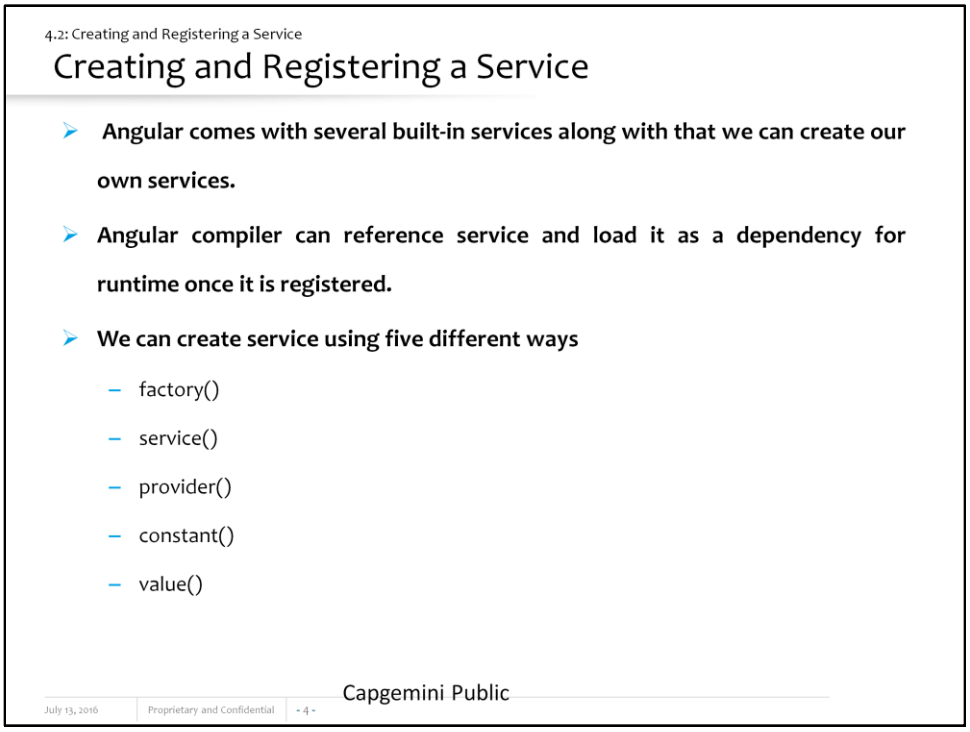

4.2: Creating and Registering a Service

Creating and Registering a Service

- Angular comes with several built-in services along with that we can create our own services.
- Angular compiler can reference service and load it as a dependency for runtime once it is registered.
- We can create service using five different ways
  - factory()
  - service()
  - provider()
  - constant()
  - value()

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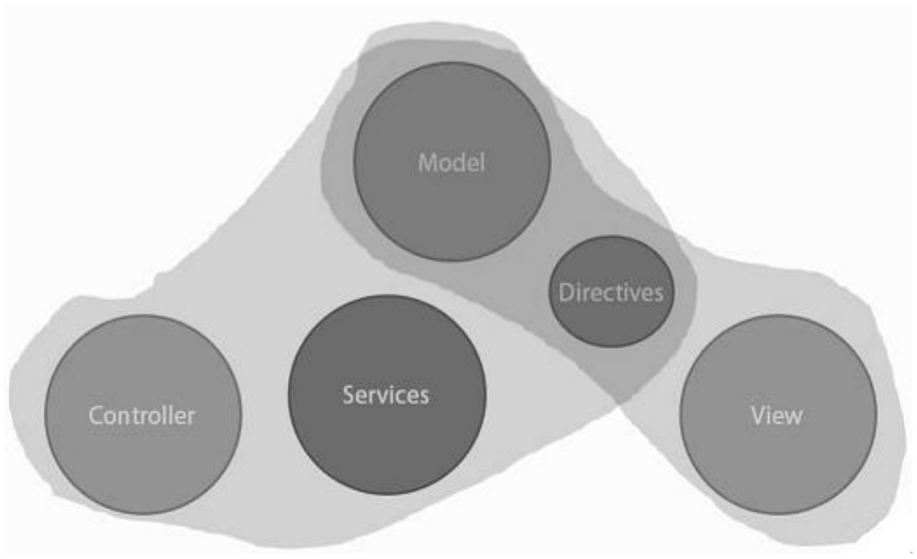

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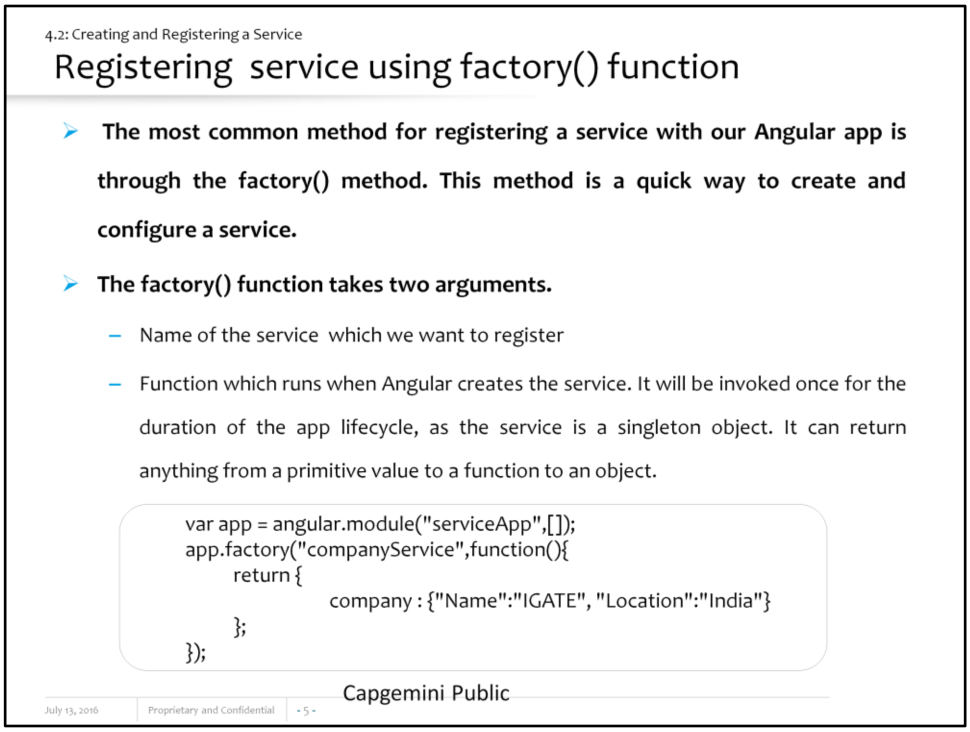

4.2: Creating and Registering a Service

Registering service using factory() function

- **The most common method for registering a service with our Angular app is through the factory() method. This method is a quick way to create and configure a service.**
- **The factory() function takes two arguments.**
  - Name of the service which we want to register
  - Function which runs when Angular creates the service. It will be invoked once for the duration of the app lifecycle, as the service is a singleton object. It can return anything from a primitive value to a function to an object.

```
var app = angular.module("serviceApp",[]);
app.factory("companyService",function(){
    return {
        company : {"Name":"IGATE", "Location":"India"}
    };
});
```

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```
<div ng-app="serviceApp" ng-controller="ServiceCntrl">
    <div>{{company.Name}} - {{company.Location}}</div>
</div>

<script>
var app = angular.module("serviceApp",[]);
app.factory("companyService",function(){
                    return {
company : {"Name":"IGATE", "Location":"India"}
                    };
});

app.controller('ServiceCntrl',function($scope,companyService
){
      $scope.company = companyService.company;
});
</script>
```

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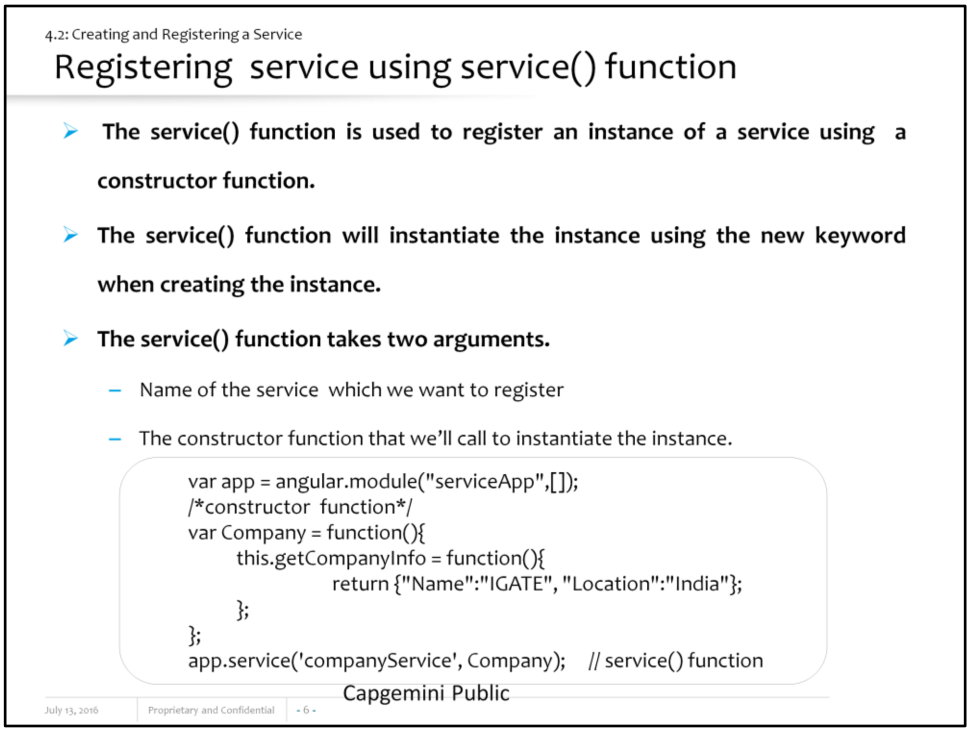

4.2: Creating and Registering a Service

Registering service using service() function

- **The service() function is used to register an instance of a service using a constructor function.**
- **The service() function will instantiate the instance using the new keyword when creating the instance.**
- **The service() function takes two arguments.**
  - Name of the service which we want to register
  - The constructor function that we'll call to instantiate the instance.

```
var app = angular.module("serviceApp",[]);
/*constructor  function*/
var Company = function(){
        this.getCompanyInfo = function(){
                        return {"Name":"IGATE", "Location":"India"};
        };
};
app.service('companyService', Company);    // service() function
```

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```
<div ng-app="serviceApp" ng-controller="ServiceCntrl">
        <div>{{company.Name}} - {{company.Location}}</div>
</div>

<script>
var app = angular.module("serviceApp",[]);

var Company = function(){
        this.getCompanyInfo = function(){
              return {"Name":"IGATE", "Location":"India"};
        };
};
app.service('companyService', Company);

app.controller('ServiceCntrl',function($scope,companyService){
      $scope.company = companyService.getCompanyInfo();
});
</script>
```

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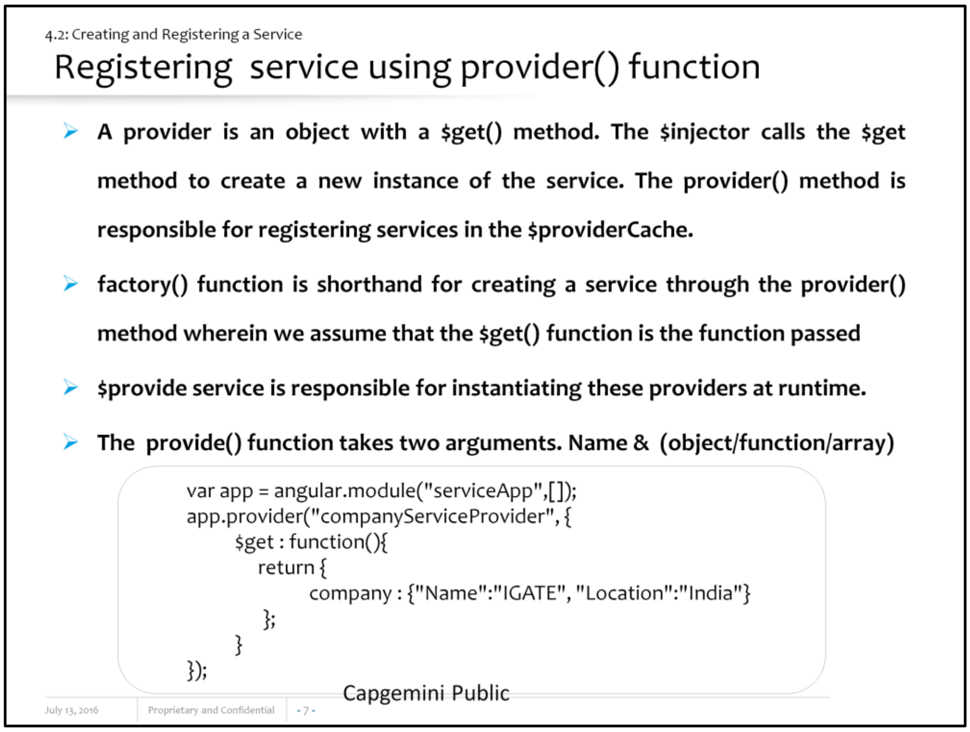

4.2: Creating and Registering a Service

Registering service using provider() function

- A provider is an object with a $get() method. The $injector calls the $get method to create a new instance of the service. The provider() method is responsible for registering services in the $providerCache.
- factory() function is shorthand for creating a service through the provider() method wherein we assume that the $get() function is the function passed
- $provide service is responsible for instantiating these providers at runtime.
- The provide() function takes two arguments. Name & (object/function/array)

```
var app = angular.module("serviceApp",[]);
app.provider("companyServiceProvider", {
        $get : function(){
           return {
                  company : {"Name":"IGATE", "Location":"India"}
            };
        }
});
```

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```
<div ng-app="serviceApp" ng-controller="ServiceCntrl">
        <div>{{company.Name}} - {{company.Location}}</div>
</div>

<script>
var app = angular.module("serviceApp",[]);
app.provider("companyService", {
        $get : function(){
                return {
                        company : {"Name":"IGATE", "Location":"India"}
                 };
        }
});

app.controller('ServiceCntrl',function($scope,companyService){
          $scope.company = companyService.company;
});
</script>
```

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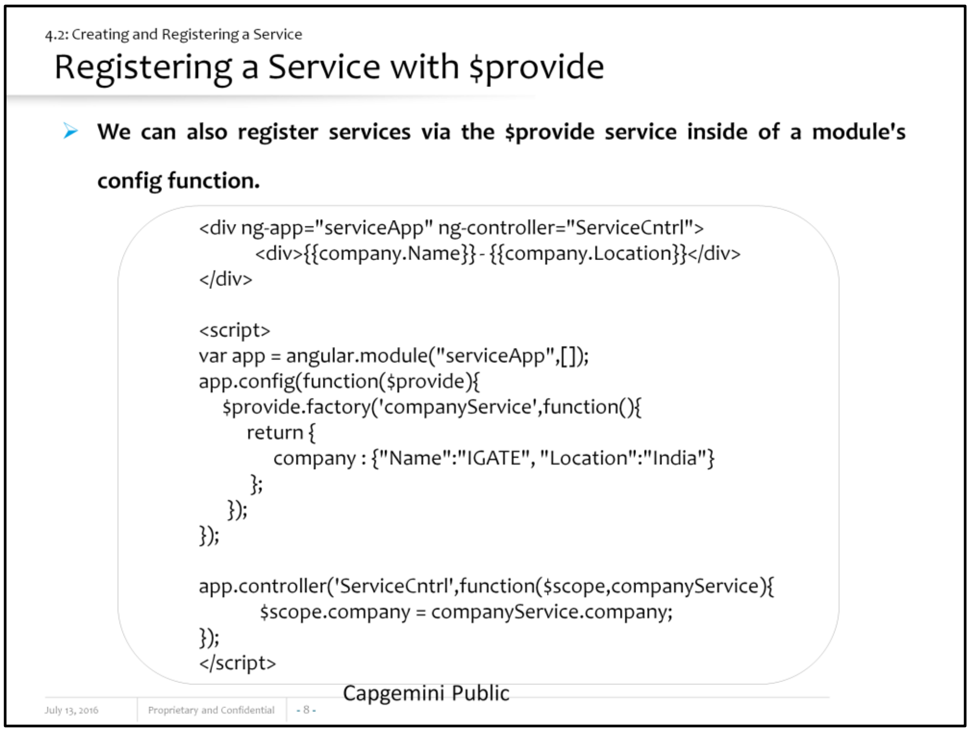

4.2: Creating and Registering a Service

Registering a Service with $provide

- **We can also register services via the $provide service inside of a module's config function.**

```
<div ng-app="serviceApp" ng-controller="ServiceCntrl">
        <div>{{company.Name}} - {{company.Location}}</div>
</div>

<script>
var app = angular.module("serviceApp",[]);
app.config(function($provide){
   $provide.factory('companyService',function(){
       return {
           company : {"Name":"IGATE", "Location":"India"}
       };
   });
});

app.controller('ServiceCntrl',function($scope,companyService){
        $scope.company = companyService.company;
});
</script>
```

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```
<div ng-app="serviceApp" ng-controller="ServiceCntrl">
        <div>{{company.Name}} - {{company.Location}}</div>
</div>

<script>
var app = angular.module("serviceApp",[]);
app.provider("companyService", {
        $get : function(){
                return {
                        company : {"Name":"IGATE", "Location":"India"}
                 };
        }
});

app.controller('ServiceCntrl',function($scope,companyService){
        $scope.company = companyService.company;
});
</script>
```

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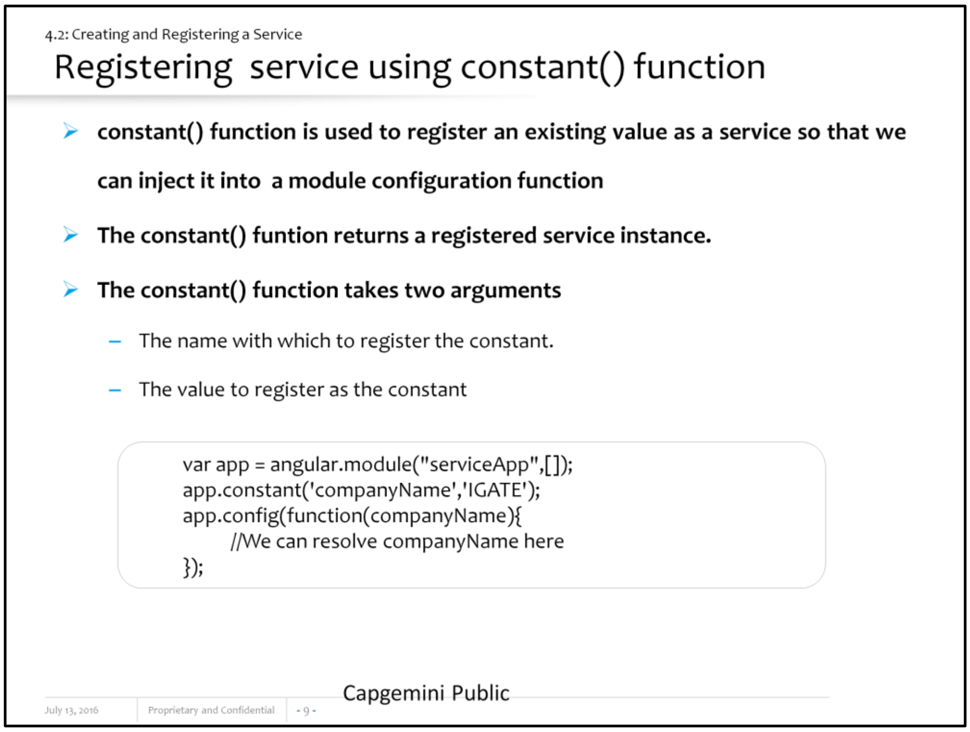

4.2: Creating and Registering a Service

Registering service using constant() function

- **constant() function is used to register an existing value as a service so that we can inject it into a module configuration function**
- **The constant() funtion returns a registered service instance.**
- **The constant() function takes two arguments**
  - The name with which to register the constant.
  - The value to register as the constant

```
var app = angular.module("serviceApp",[]);
app.constant('companyName','IGATE');
app.config(function(companyName){
        //We can resolve companyName here
});
```

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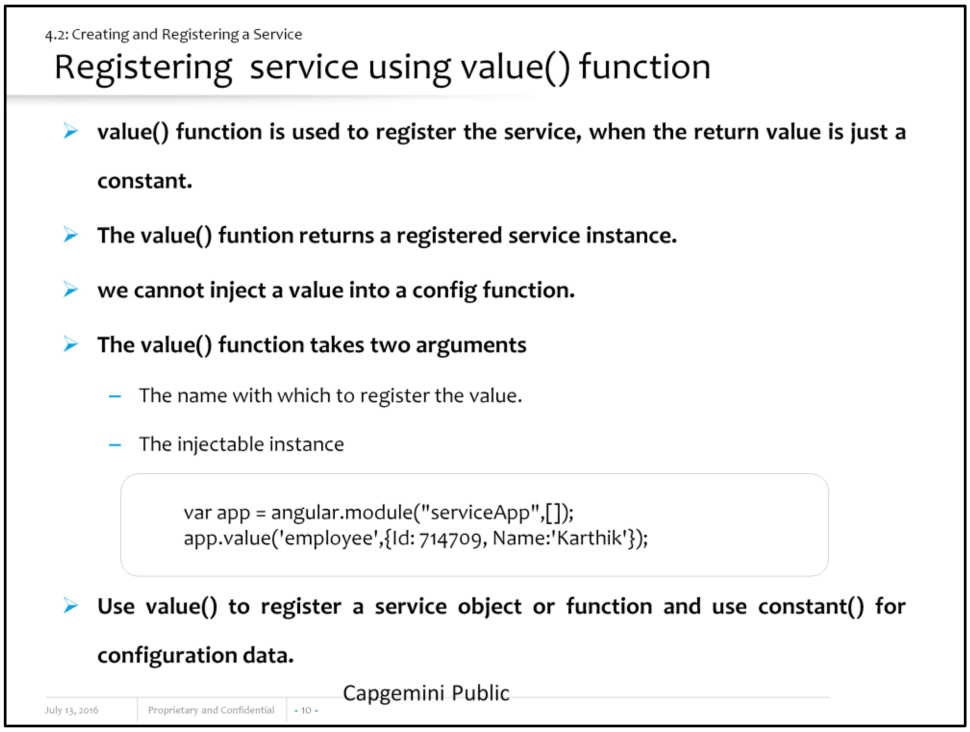

4.2: Creating and Registering a Service

Registering service using value() function

- **value() function is used to register the service, when the return value is just a constant.**
- **The value() funtion returns a registered service instance.**
- **we cannot inject a value into a config function.**
- **The value() function takes two arguments**
  - The name with which to register the value.
  - The injectable instance

```
var app = angular.module("serviceApp",[]);
app.value('employee',{Id: 714709, Name:'Karthik'});
```

- **Use value() to register a service object or function and use constant() for configuration data.**

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```
<div ng-app="serviceApp" ng-controller="ServiceCntrl">
  <div>Id : <input type="text" ng-model="Id" /></div>
  <div>Name : <input type="text" ng-model="Name" /></div>
</div>

<script>
var app = angular.module("serviceApp",[]);
app.value('employee',{Id: 714709, Name:'Karthik'});
app.controller('ServiceCntrl',function($scope,employee){
          $scope.Id = employee.Id;
          $scope.Name = employee.Name;
});
</script>
```

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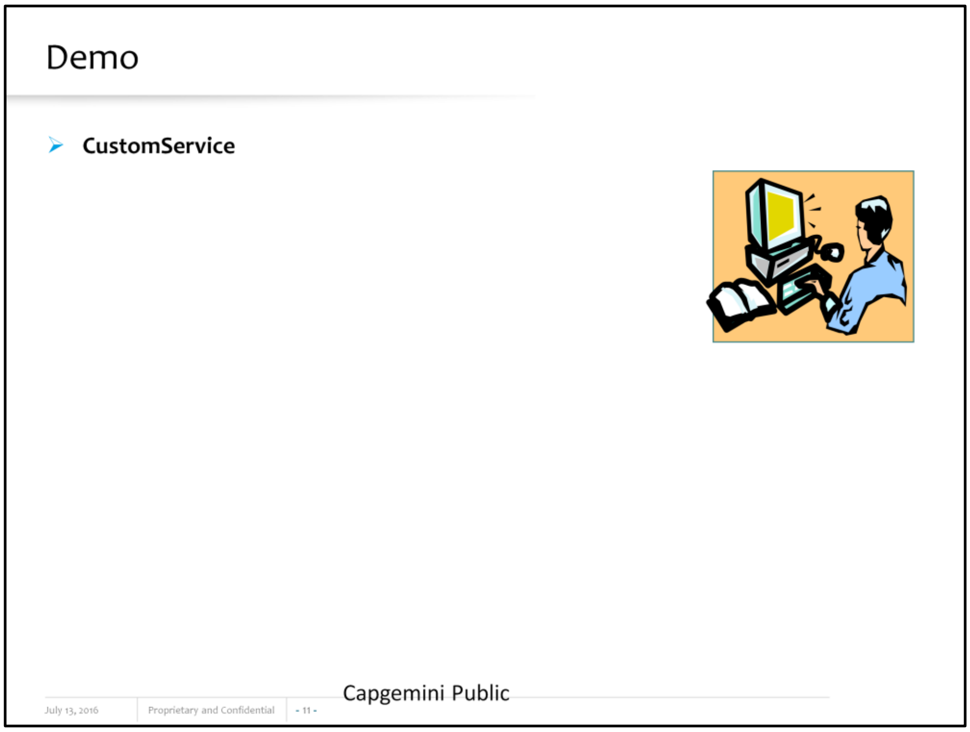
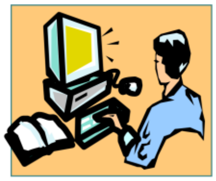


Demo

- CustomService



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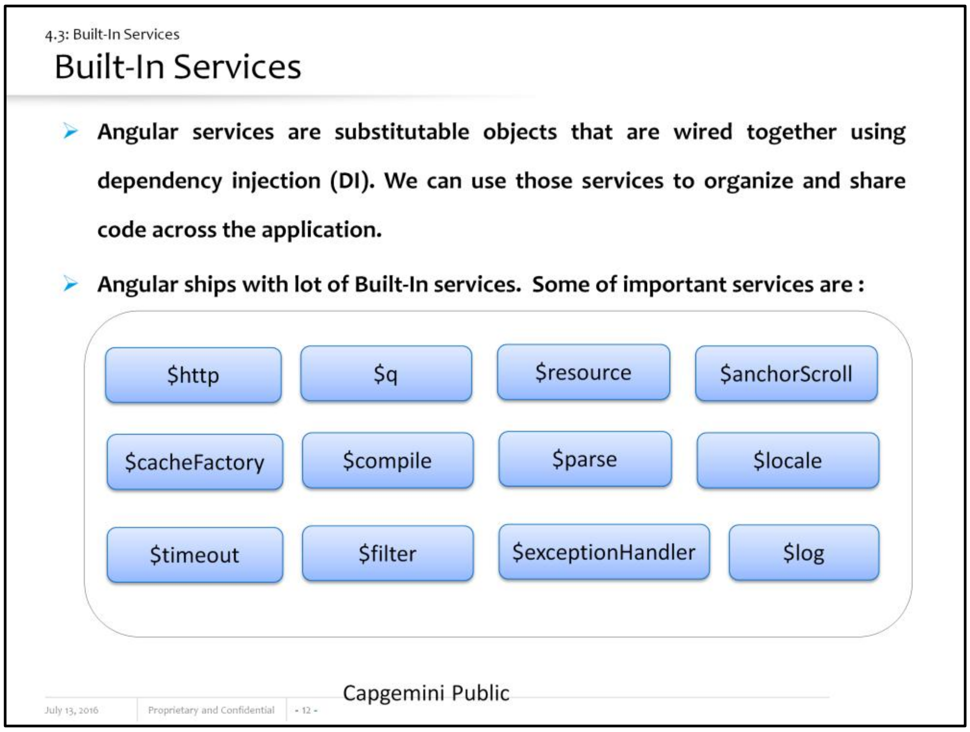

4.3: Built-In Services

Built-In Services

- Angular services are substitutable objects that are wired together using dependency injection (DI). We can use those services to organize and share code across the application.
- Angular ships with lot of Built-In services. Some of important services are :

$http	$q	$resource	$anchorScroll
$cacheFactory	$compile	$parse	$locale
$timeout	$filter	$exceptionHandler	$log

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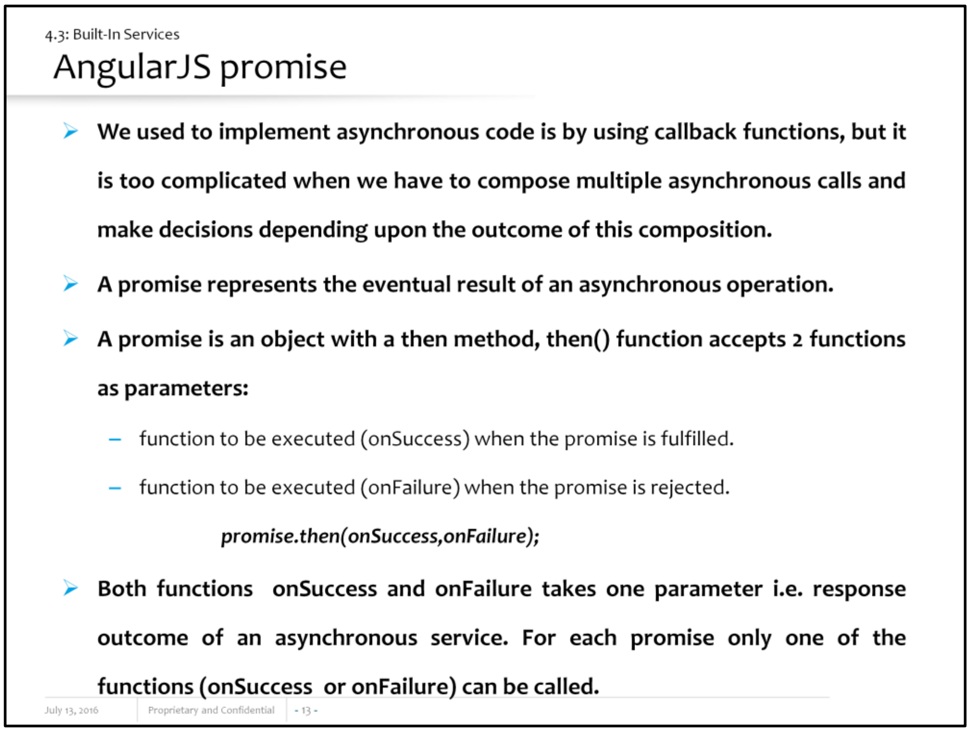

4.3: Built-In Services

AngularJS promise

- **We used to implement asynchronous code is by using callback functions, but it is too complicated when we have to compose multiple asynchronous calls and make decisions depending upon the outcome of this composition.**
- **A promise represents the eventual result of an asynchronous operation.**
- **A promise is an object with a then method, then() function accepts 2 functions as parameters:**
  - function to be executed (onSuccess) when the promise is fulfilled.
  - function to be executed (onFailure) when the promise is rejected.

    promise.then(onSuccess,onFailure);
- **Both functions onSuccess and onFailure takes one parameter i.e. response outcome of an asynchronous service. For each promise only one of the functions (onSuccess or onFailure) can be called.**

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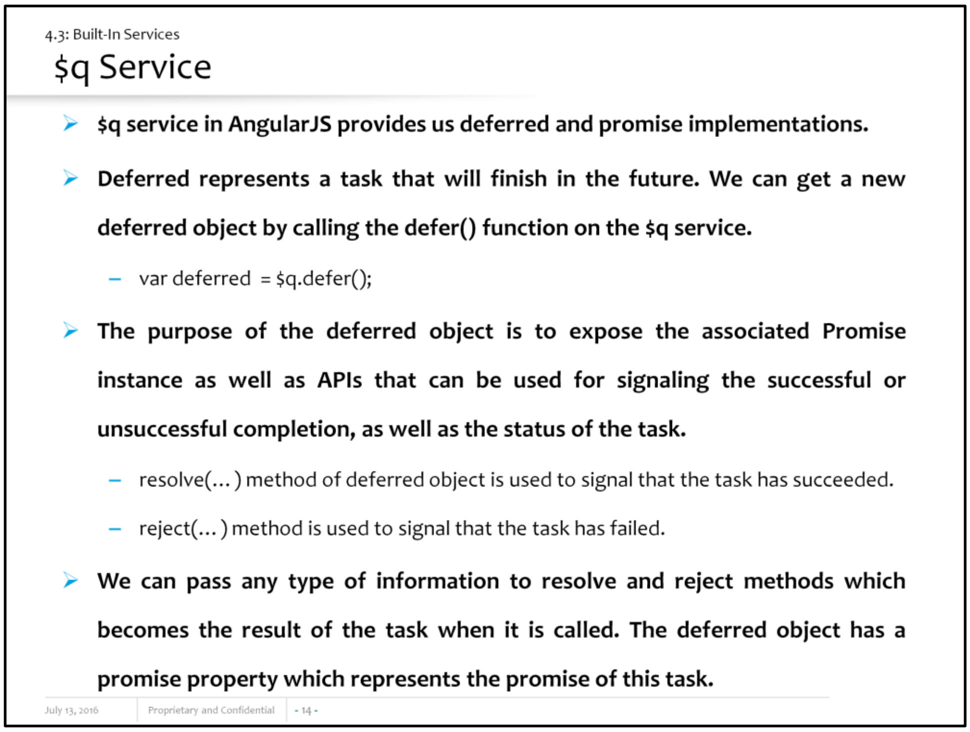

4.3: Built-In Services

$q Service

- $q service in AngularJS provides us deferred and promise implementations.
- Deferred represents a task that will finish in the future. We can get a new deferred object by calling the defer() function on the $q service.
  - var deferred = $q.defer();
- The purpose of the deferred object is to expose the associated Promise instance as well as APIs that can be used for signaling the successful or unsuccessful completion, as well as the status of the task.
  - resolve(…) method of deferred object is used to signal that the task has succeeded.
  - reject(…) method is used to signal that the task has failed.
- We can pass any type of information to resolve and reject methods which becomes the result of the task when it is called. The deferred object has a promise property which represents the promise of this task.

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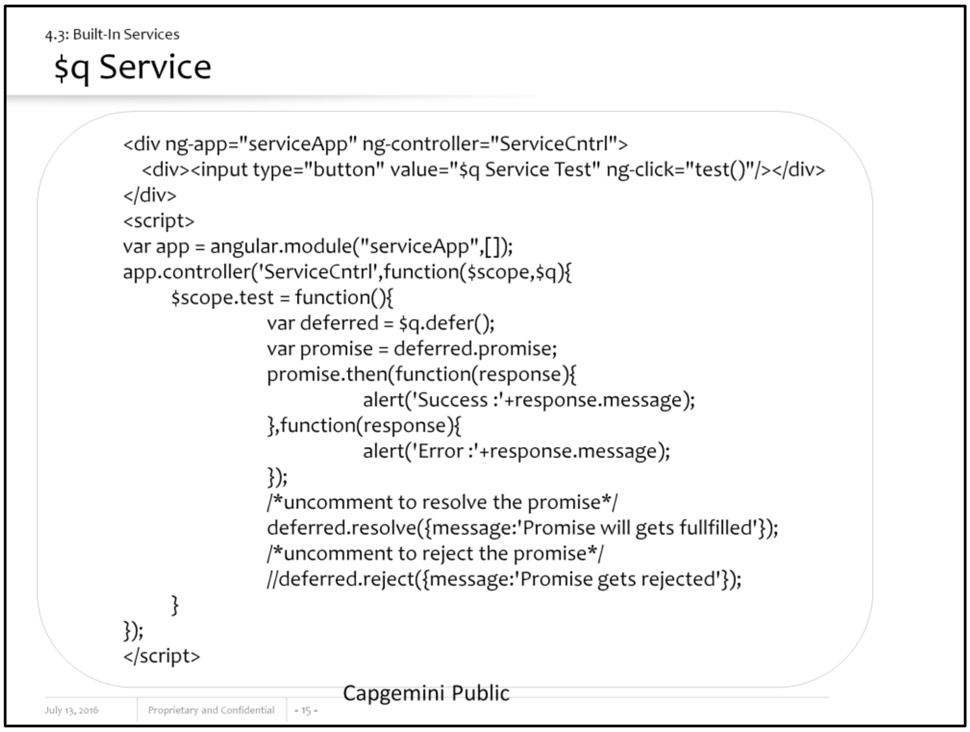

4.3: Built-In Services

$q Service

```
<div ng-app="serviceApp" ng-controller="ServiceCntrl">
   <div><input type="button" value="$q Service Test" ng-click="test()"/></div>
</div>
<script>
var app = angular.module("serviceApp",[]);
app.controller('ServiceCntrl',function($scope,$q){
        $scope.test = function(){
                        var deferred = $q.defer();
                        var promise = deferred.promise;
                        promise.then(function(response){
                                alert('Success :'+response.message);
                        },function(response){
                                alert('Error :'+response.message);
                        });
                        /*uncomment to resolve the promise*/
                        deferred.resolve({message:'Promise will gets fullfilled'});
                        /*uncomment to reject the promise*/
                        //deferred.reject({message:'Promise gets rejected'});
        }
});
</script>
```

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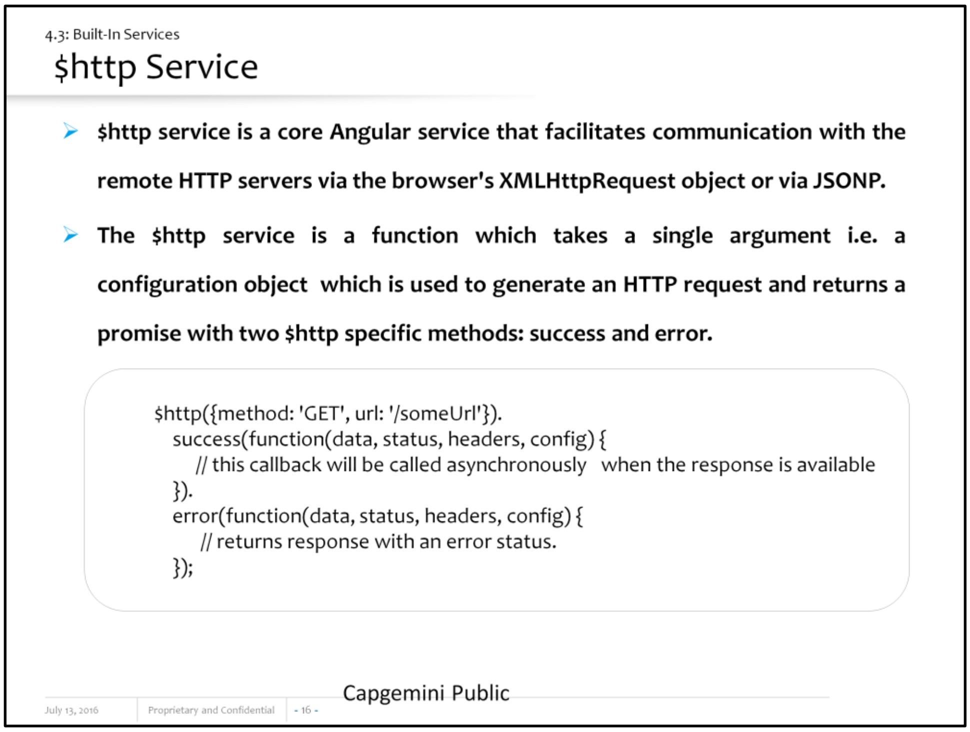

4.3: Built-In Services

$http Service

- **$http service is a core Angular service that facilitates communication with the remote HTTP servers via the browser's XMLHttpRequest object or via JSONP.**
- **The $http service is a function which takes a single argument i.e. a configuration object which is used to generate an HTTP request and returns a promise with two $http specific methods: success and error.**

```
$http({method: 'GET', url: '/someUrl'}).
   success(function(data, status, headers, config) {
       // this callback will be called asynchronously   when the response is available
   }).
   error(function(data, status, headers, config) {
       // returns response with an error status.
   });
```

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$http gives shortcut following methods by just passing the URL which returns promise.

- $http.get(url, config)
- $http.post(url, data, config)
- $http.put(url, data, config)
- $http.delete(url, config)
- $http.head(url, config)

var responsePromise = $http.get("url");

The config parameter passed to the different $http functions controls the HTTP request sent to the server. The config parameter is a JavaScript object which can contain the following properties:

- method
- url
- params
- headers
- timeout
- cache
- transformRequest
- transformResponse

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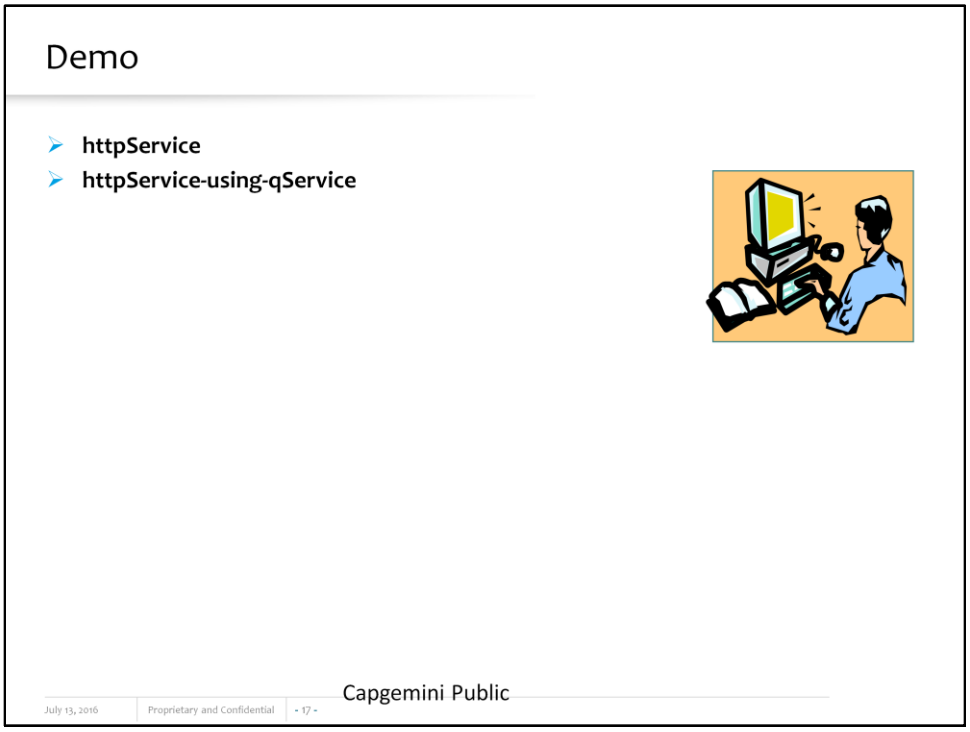
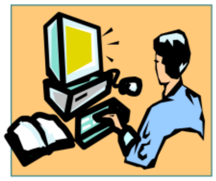


Demo

- **httpService**
- **httpService-using-qService**



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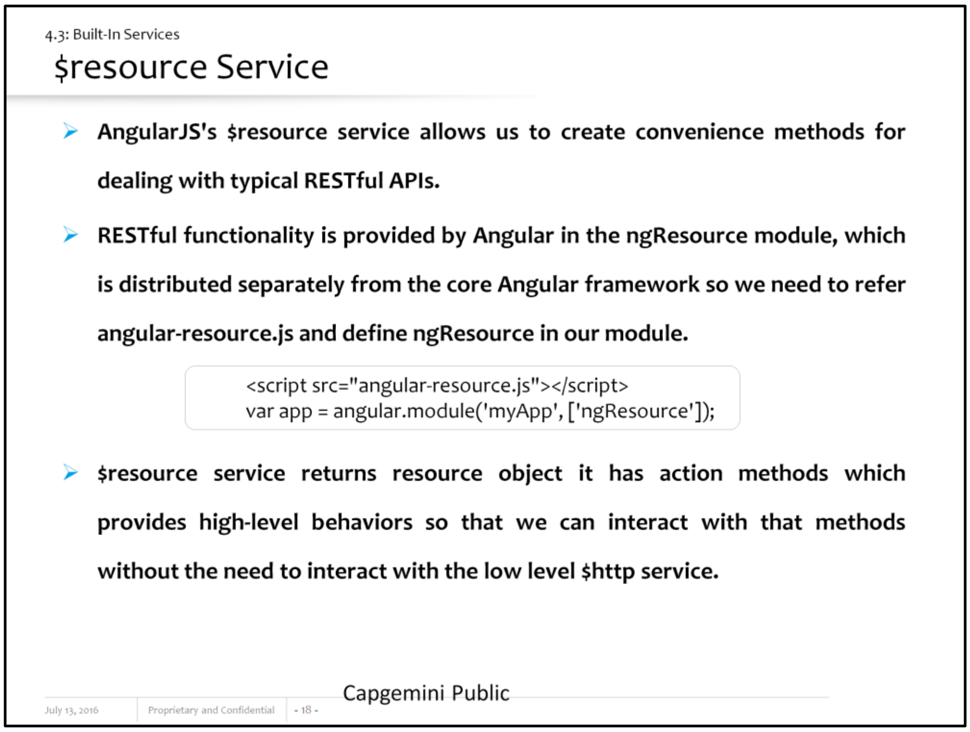

4.3: Built-In Services

$resource Service

- AngularJS's $resource service allows us to create convenience methods for dealing with typical RESTful APIs.
- RESTful functionality is provided by Angular in the ngResource module, which is distributed separately from the core Angular framework so we need to refer angular-resource.js and define ngResource in our module.

```
<script src="angular-resource.js"></script>
var app = angular.module('myApp', ['ngResource']);
```

- $resource service returns resource object it has action methods which provides high-level behaviors so that we can interact with that methods without the need to interact with the low level $http service.

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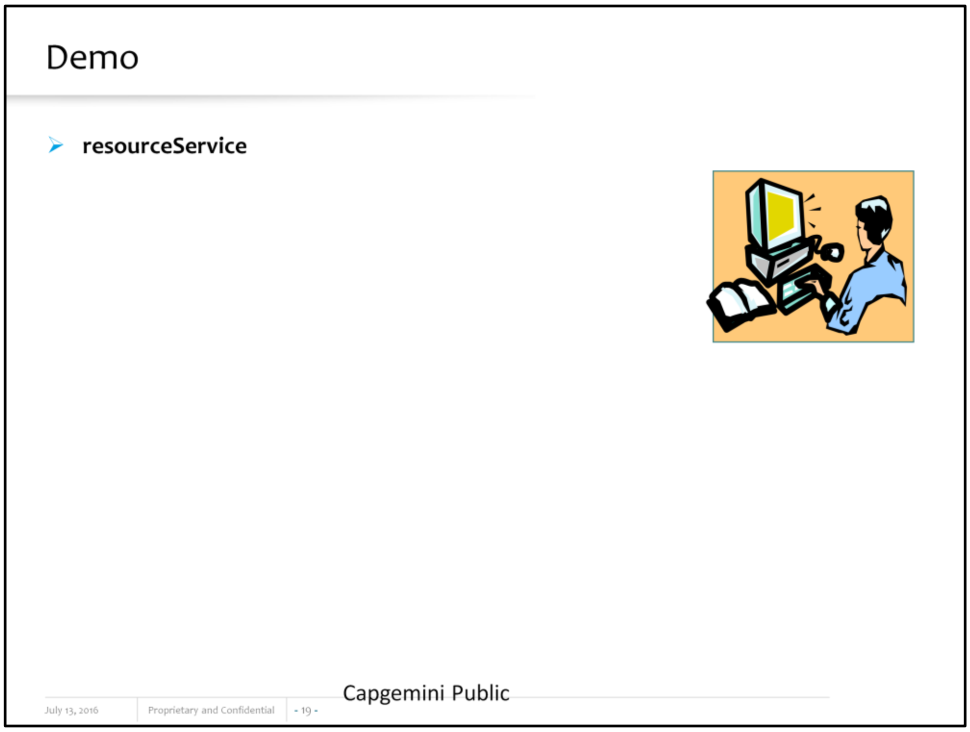
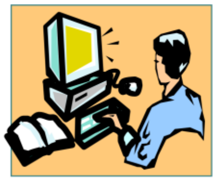


Demo

- resourceService



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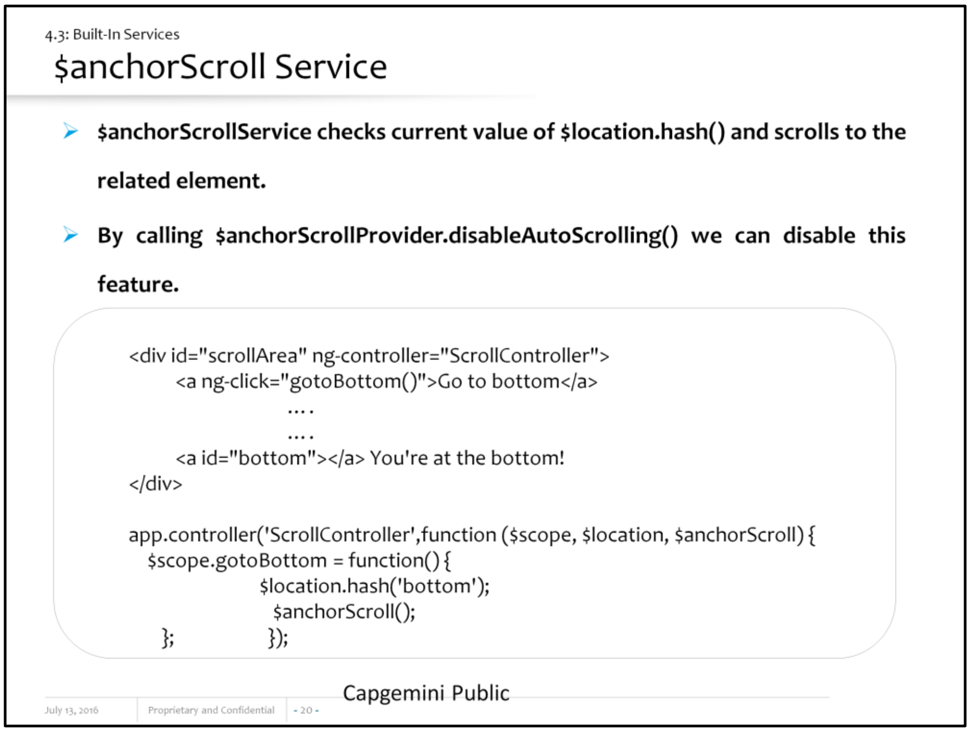

4.3: Built-In Services

$anchorScroll Service

- **$anchorScrollService checks current value of $location.hash() and scrolls to the related element.**
- **By calling $anchorScrollProvider.disableAutoScrolling() we can disable this feature.**

```
<div id="scrollArea" ng-controller="ScrollController">
        <a ng-click="gotoBottom()">Go to bottom</a>
                        ....
                        ....
        <a id="bottom"></a> You're at the bottom!
</div>

app.controller('ScrollController',function ($scope, $location, $anchorScroll) {
   $scope.gotoBottom = function() {
                    $location.hash('bottom');
                      $anchorScroll();
     };              });
```

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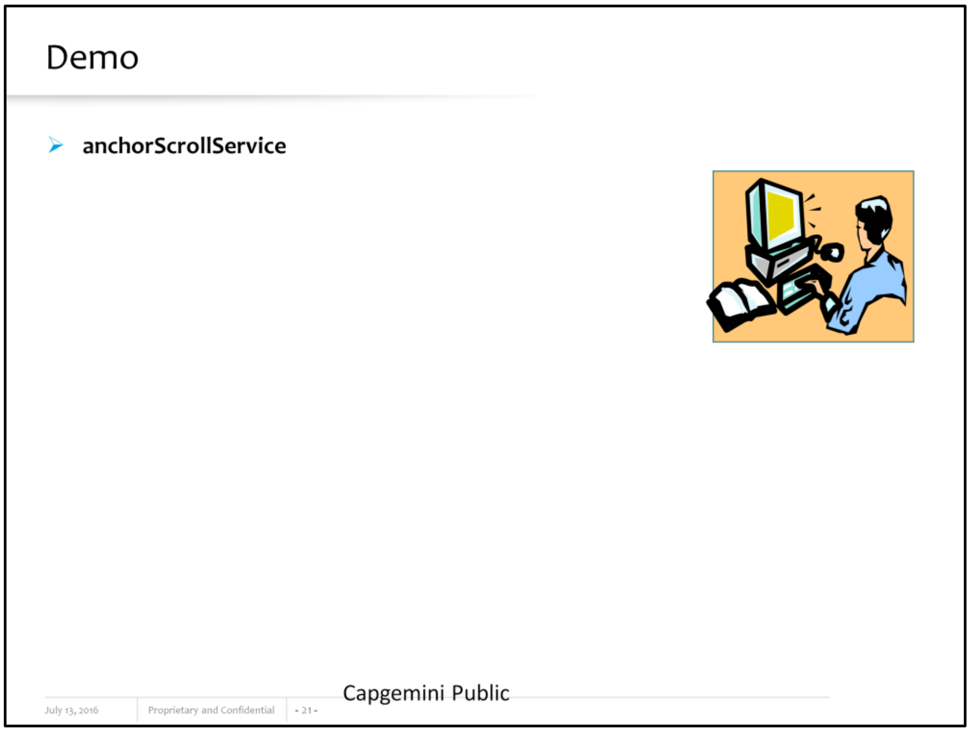
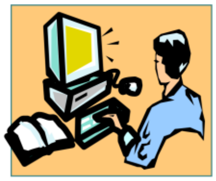


Demo

- anchorScrollService



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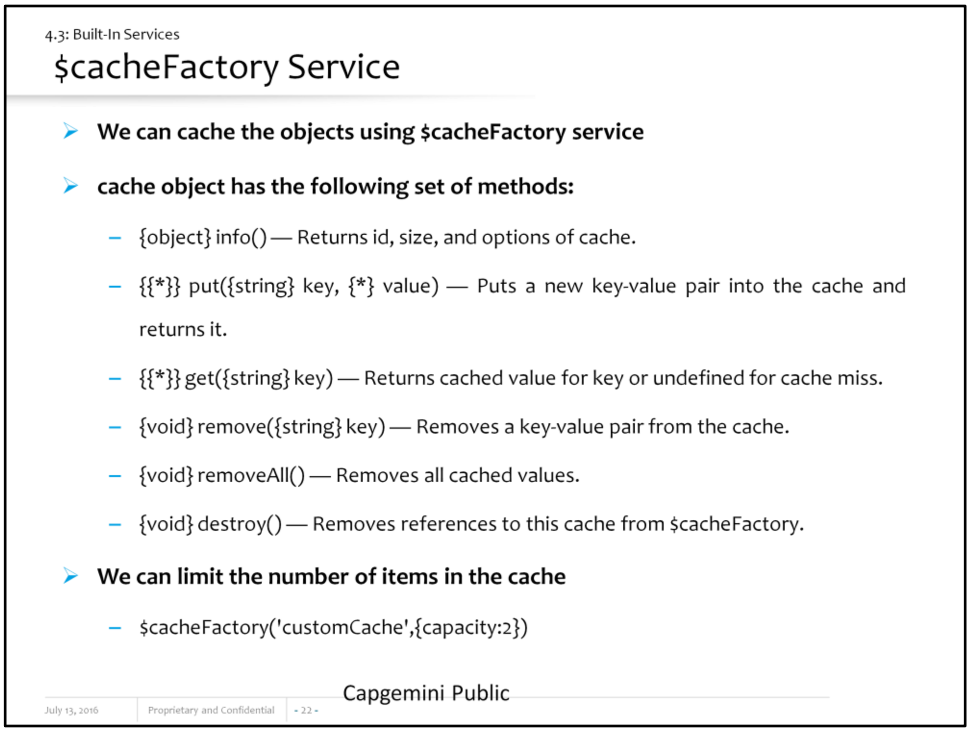

4.3: Built-In Services

$cacheFactory Service

- **We can cache the objects using $cacheFactory service**
- **cache object has the following set of methods:**
  - {object} info() — Returns id, size, and options of cache.
  - {{*}} put({string} key, {*} value) — Puts a new key-value pair into the cache and returns it.
  - {{*}} get({string} key) — Returns cached value for key or undefined for cache miss.
  - {void} remove({string} key) — Removes a key-value pair from the cache.
  - {void} removeAll() — Removes all cached values.
  - {void} destroy() — Removes references to this cache from $cacheFactory.
- **We can limit the number of items in the cache**
  - $cacheFactory('customCache',{capacity:2})

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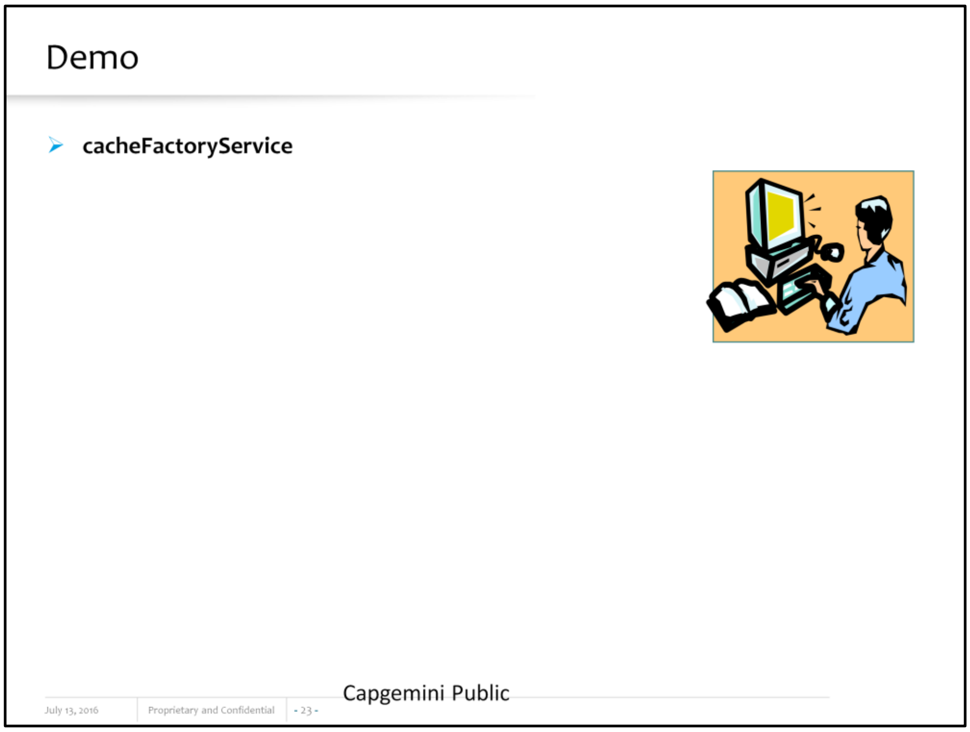

Demo

- cacheFactoryService

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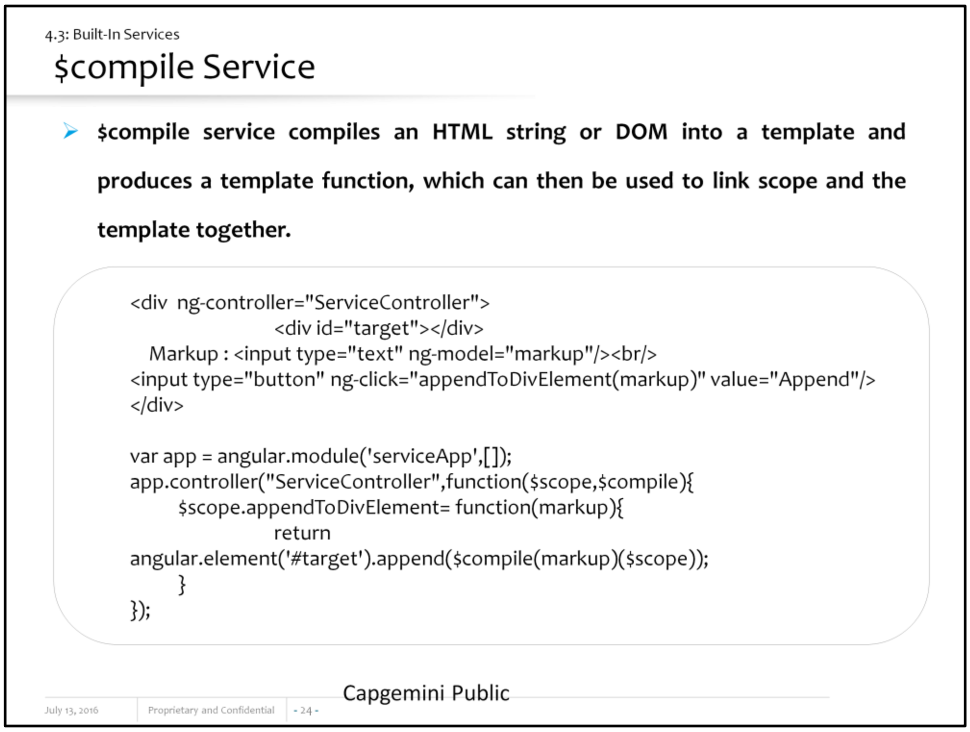

4.3: Built-In Services

$compile Service

- $compile service compiles an HTML string or DOM into a template and produces a template function, which can then be used to link scope and the template together.

```
<div  ng-controller="ServiceController">
                <div id="target"></div>
   Markup : <input type="text" ng-model="markup"/><br/>
<input type="button" ng-click="appendToDivElement(markup)" value="Append"/>
</div>

var app = angular.module('serviceApp',[]);
app.controller("ServiceController",function($scope,$compile){
       $scope.appendToDivElement= function(markup){
                    return
angular.element('#target').append($compile(markup)($scope));
       }
});
```

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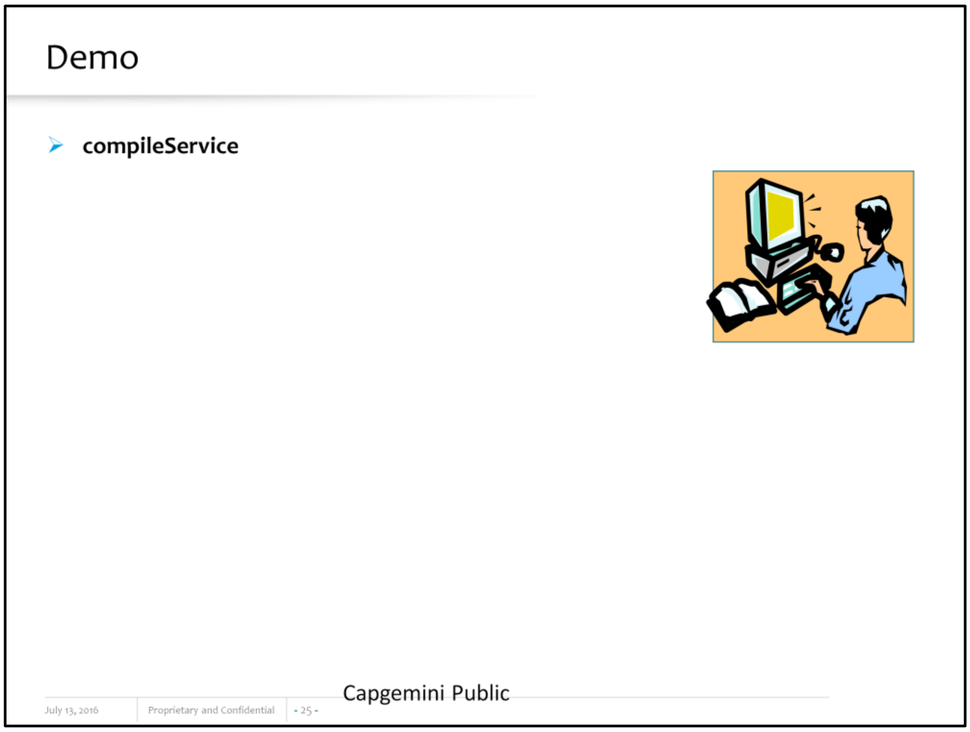

Demo

- compileService

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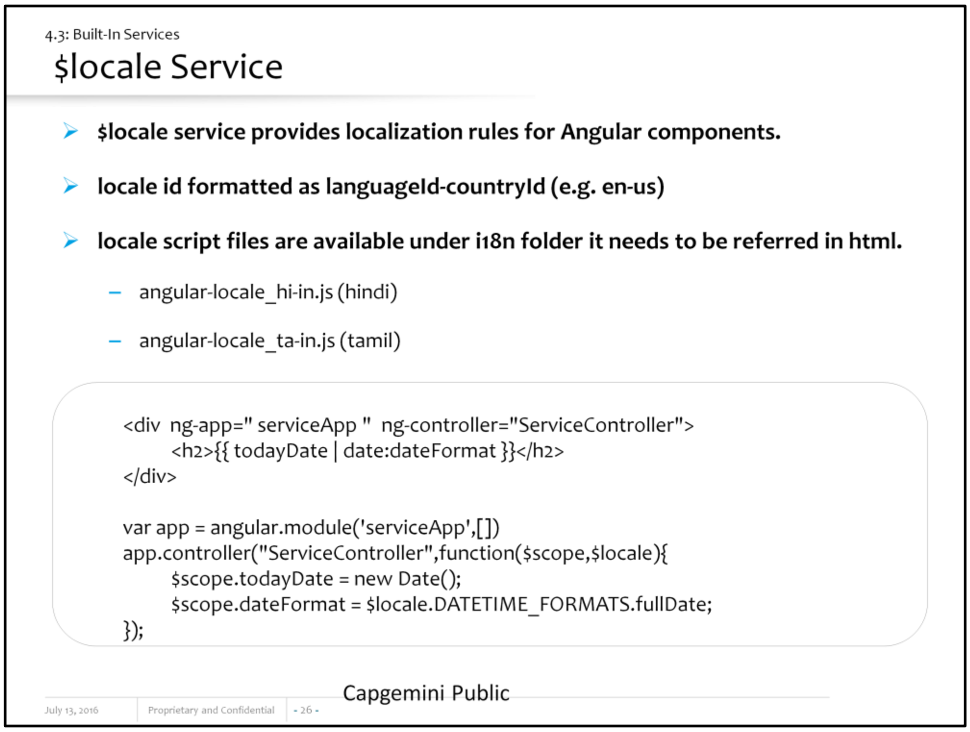

4.3: Built-In Services

$locale Service

- **$locale service provides localization rules for Angular components.**
- **locale id formatted as languageId-countryId (e.g. en-us)**
- **locale script files are available under i18n folder it needs to be referred in html.**
  - angular-locale_hi-in.js (hindi)
  - angular-locale_ta-in.js (tamil)

```
<div  ng-app=" serviceApp "  ng-controller="ServiceController">
        <h2>{{ todayDate | date:dateFormat }}</h2>
</div>

var app = angular.module('serviceApp',[])
app.controller("ServiceController",function($scope,$locale){
        $scope.todayDate = new Date();
        $scope.dateFormat = $locale.DATETIME_FORMATS.fullDate;
});
```

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Instructor Notes:

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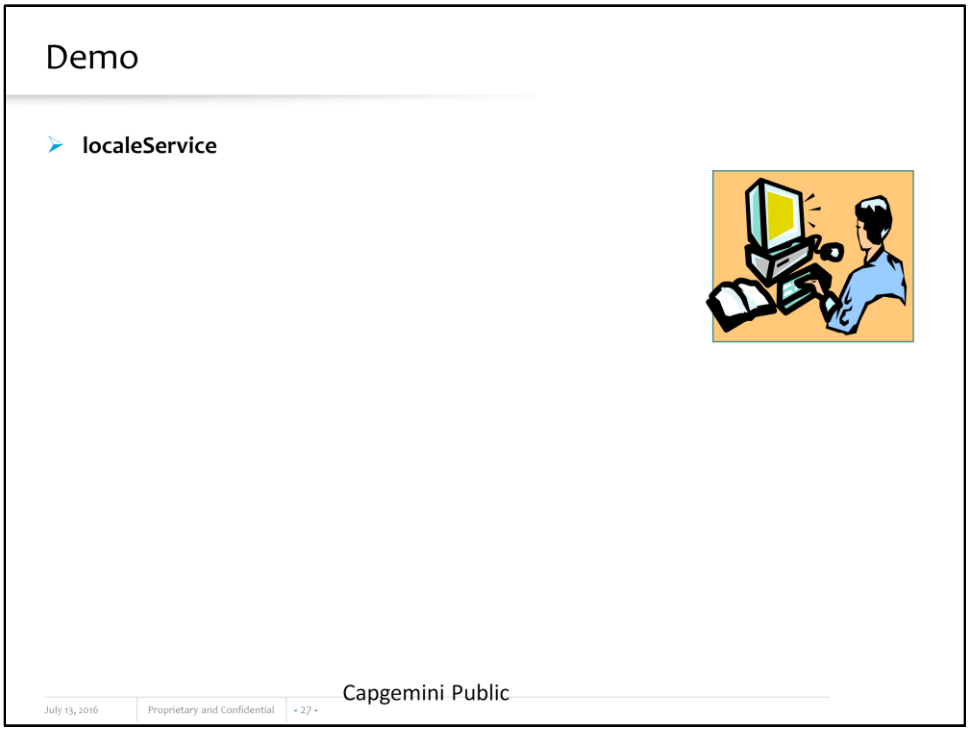
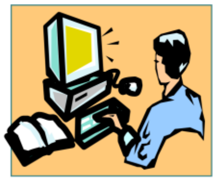


Demo

- localeService



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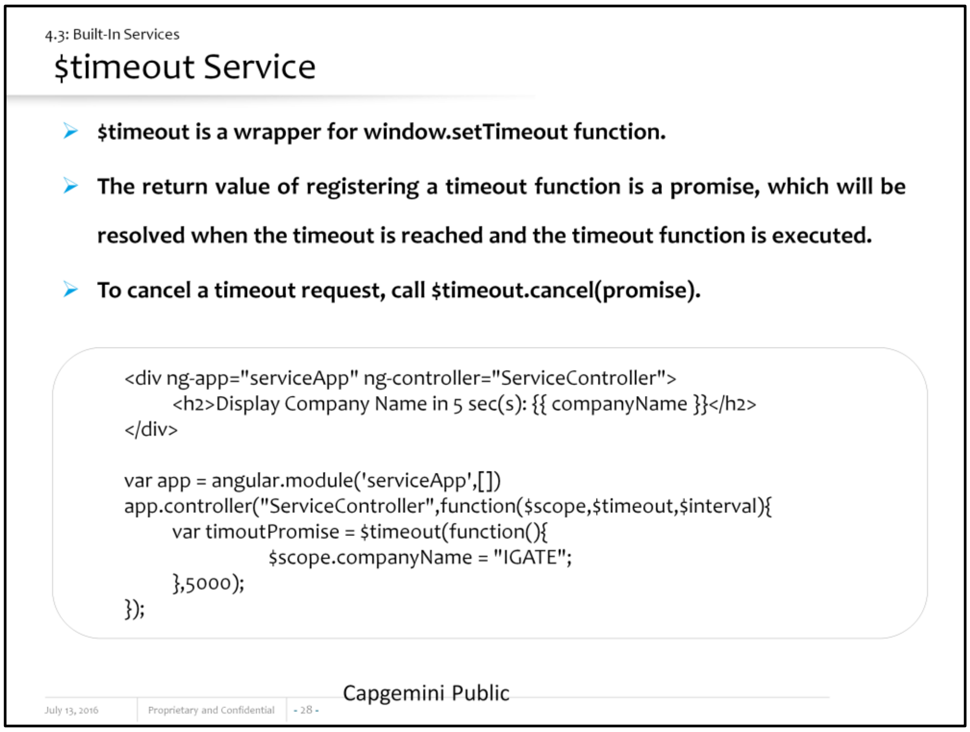

4.3: Built-In Services

$timeout Service

- **$timeout is a wrapper for window.setTimeout function.**
- **The return value of registering a timeout function is a promise, which will be resolved when the timeout is reached and the timeout function is executed.**
- **To cancel a timeout request, call $timeout.cancel(promise).**

```
<div ng-app="serviceApp" ng-controller="ServiceController">
        <h2>Display Company Name in 5 sec(s): {{ companyName }}</h2>
</div>

var app = angular.module('serviceApp',[])
app.controller("ServiceController",function($scope,$timeout,$interval){
        var timoutPromise = $timeout(function(){
                        $scope.companyName = "IGATE";
        },5000);
});
```

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Instructor Notes:

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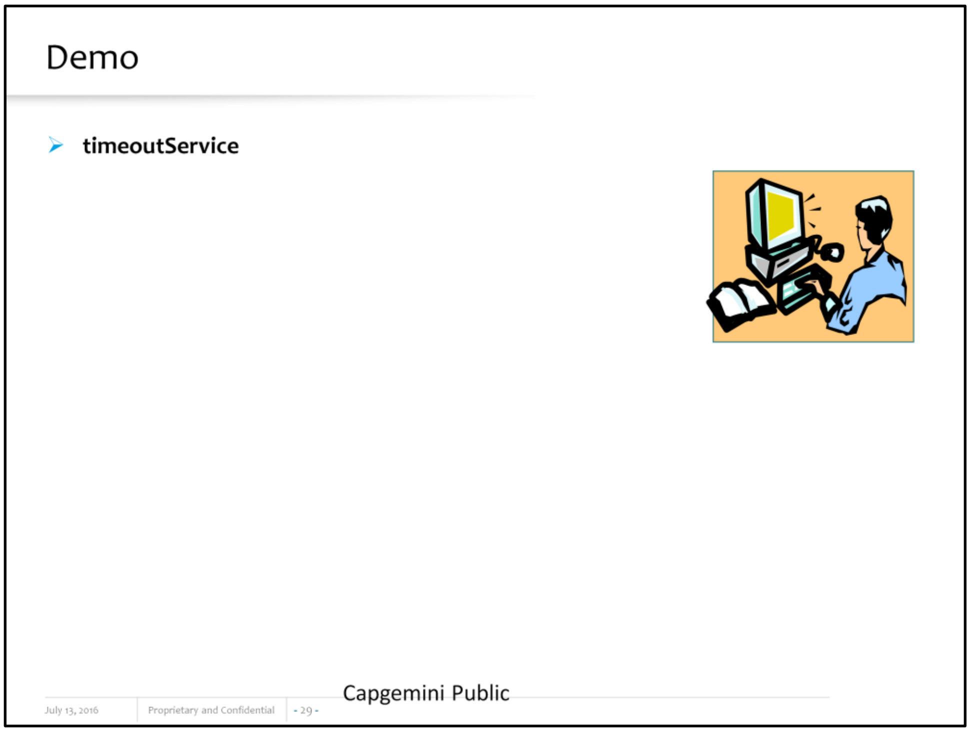
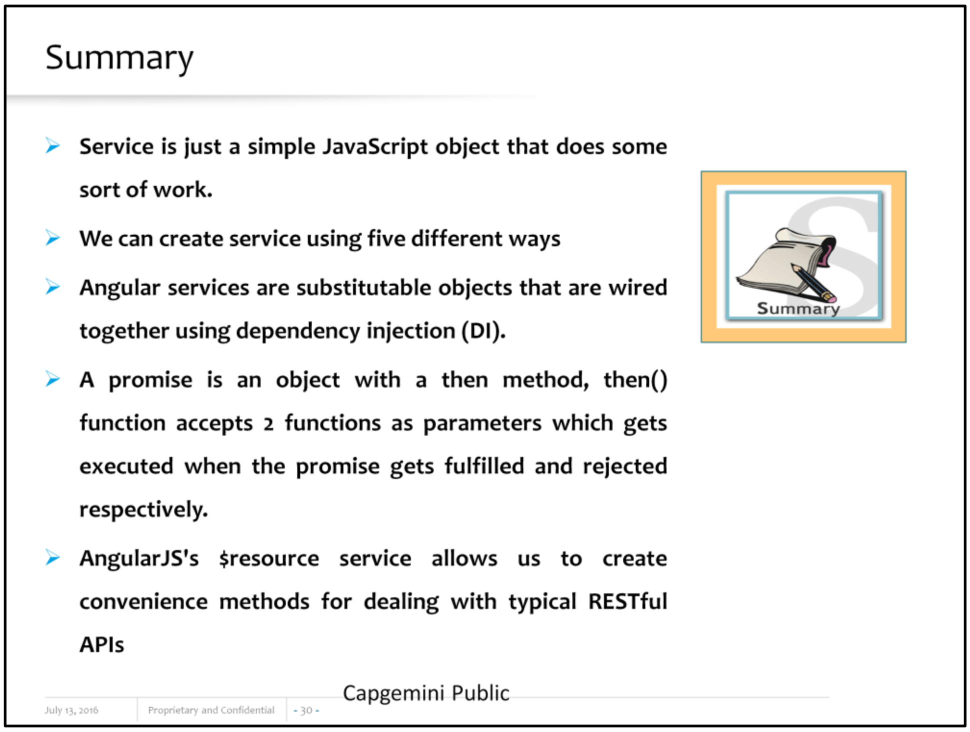


Demo

- **timeoutService**

Instructor Notes:

Add instructor notes here.



Summary

- Service is just a simple JavaScript object that does some sort of work.
- We can create service using five different ways
- Angular services are substitutable objects that are wired together using dependency injection (DI).
- A promise is an object with a then method, then() function accepts 2 functions as parameters which gets executed when the promise gets fulfilled and rejected respectively.
- AngularJS's $resource service allows us to create convenience methods for dealing with typical RESTful APIs

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Add the notes here.