Integrating Angular with ASP.NET Core RESTful Services

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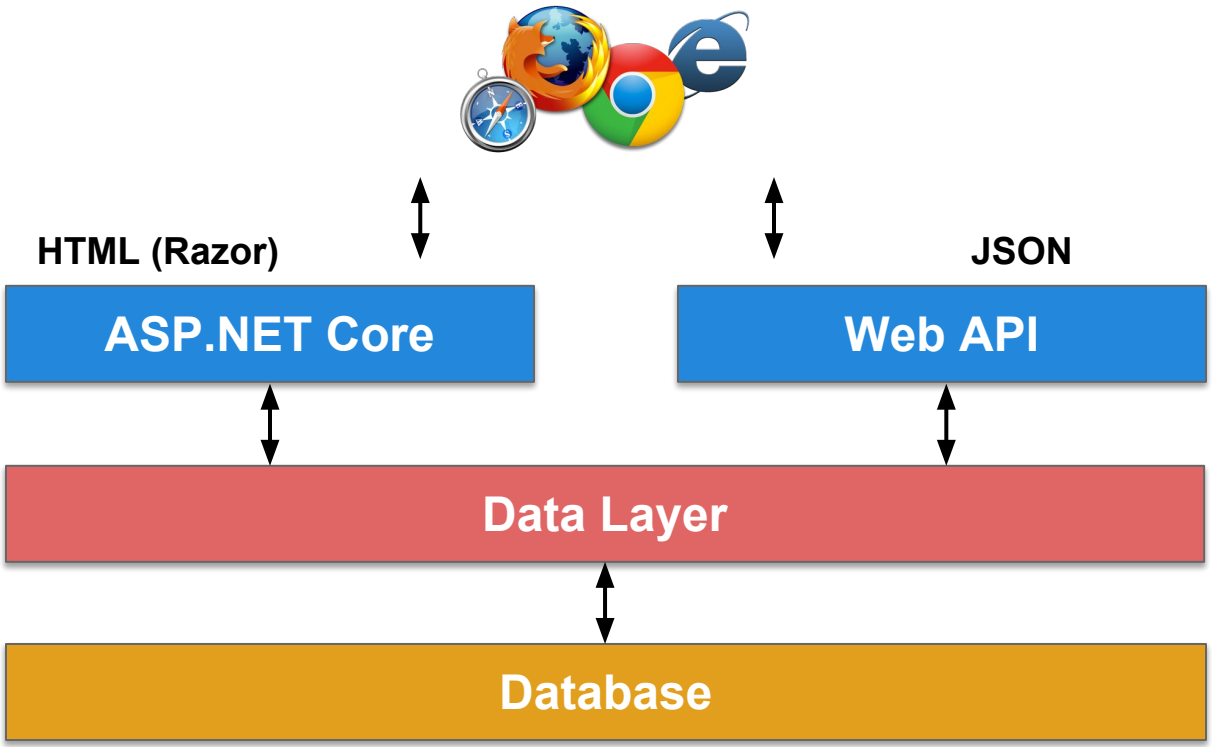
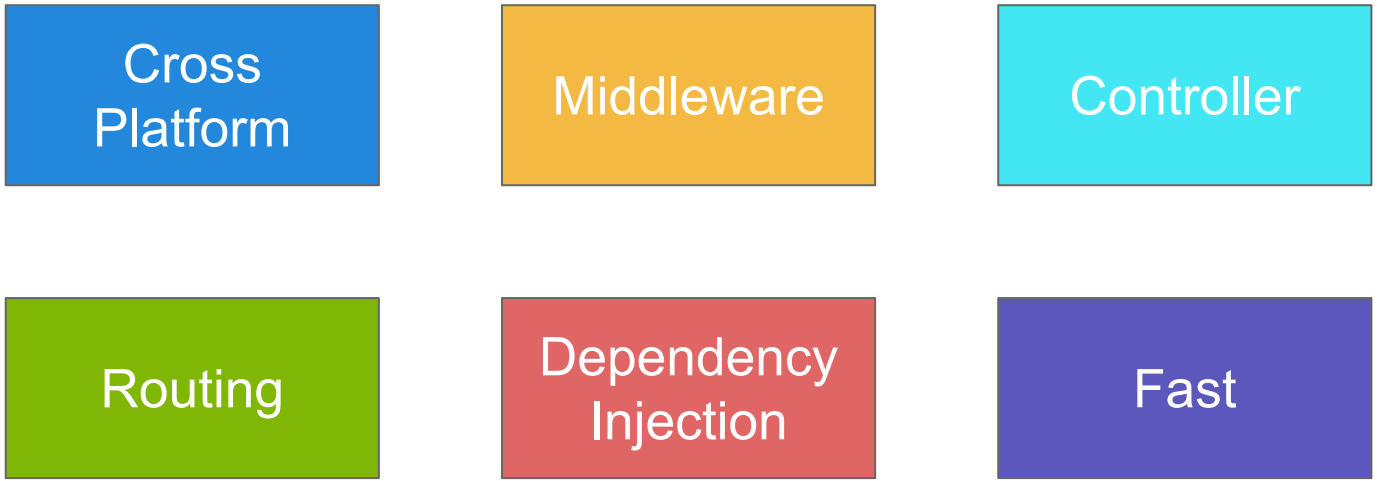
Agenda

- The Big Picture
- Creating a Web API Project
- Angular Services
- Injecting Services into Components

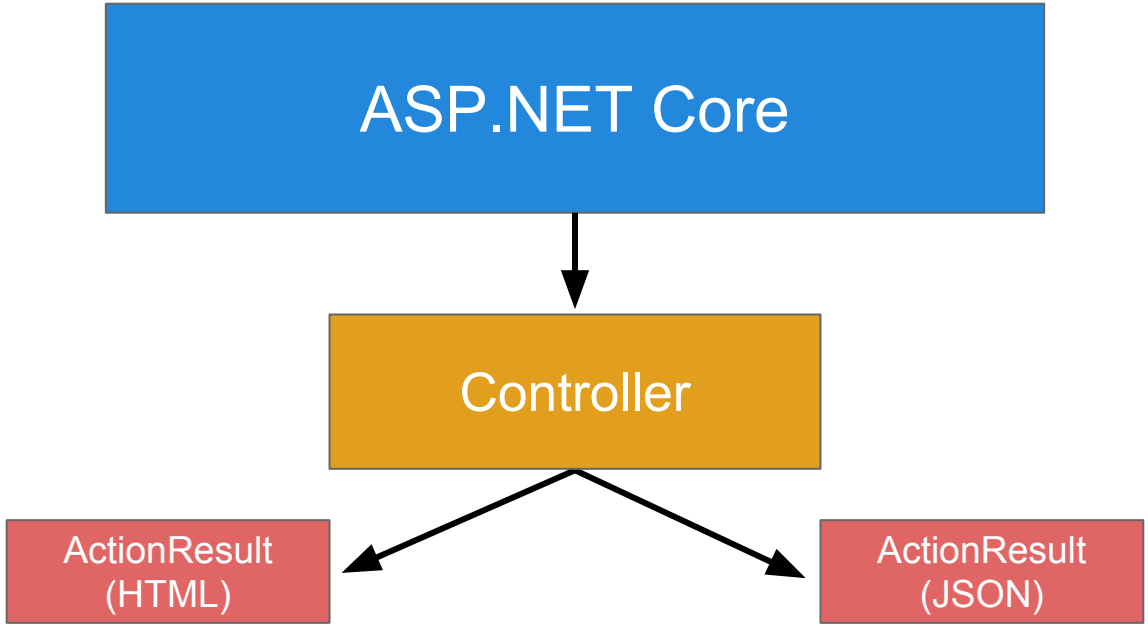
The Big Picture



ASP.NET Core and Web API

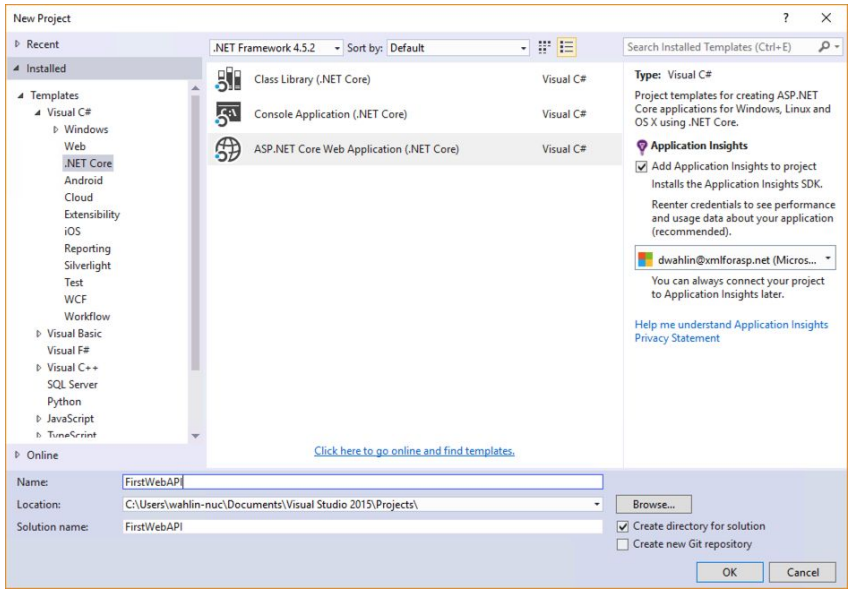


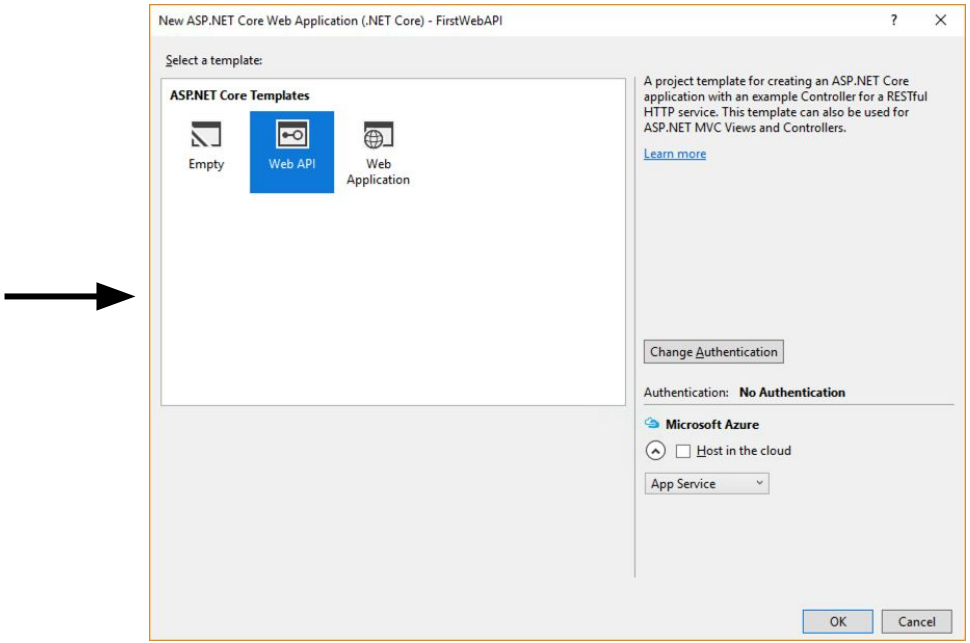
ASP.NET Core Controllers



Creating a Web API Project

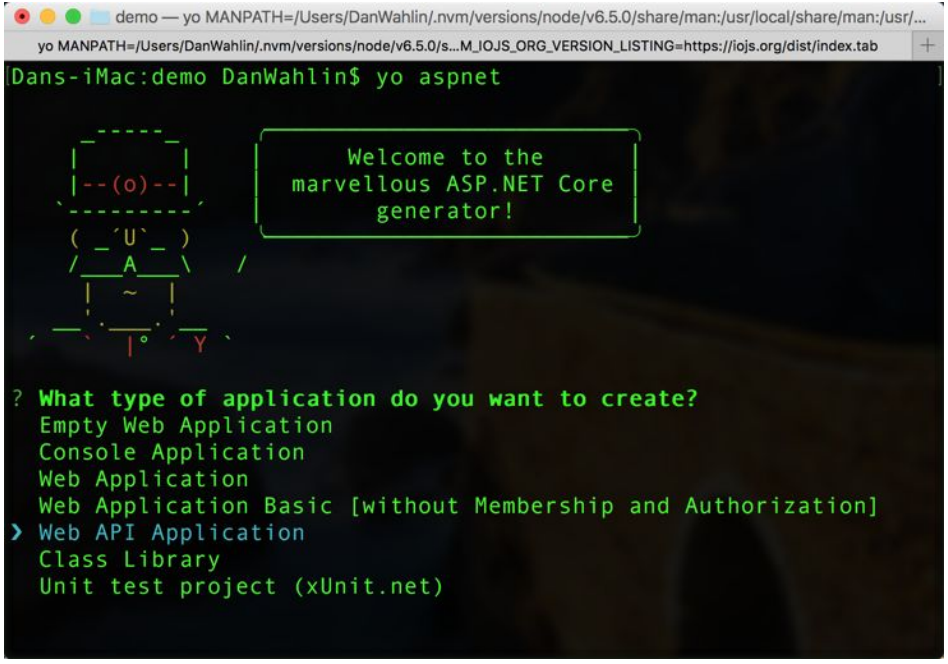
Creating a Web API Project in Visual Studio





Creating a Web API Project on Mac

1. npm install -g yo generator-aspnet
2. yo aspnet



Creating a Controller

ASP.NET MVC and Web API controller classes both derive from ***Controller***:

CustomersController.cs

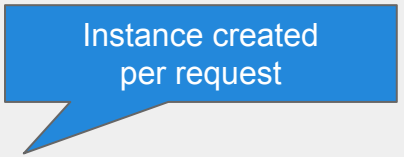
```
[Route("api/[controller]")]
public class CustomersController : Controller
{

}
```

Defining Injectables

Configure dependency injection in Startup.cs

Startup.cs

```
public void ConfigureServices(IServiceCollection services)
{


    //Configure an injectable object
    services.AddScoped<ICustomersRepository, CustomersRepository>();


    ...
}
```



Using Dependency Injection

Objects configured in Startup.cs ConfigureServices() can be injected:

CustomersController.cs

```
[Route("api/[controller]")]
public class CustomersServiceController : Controller
{
    ICustomersRepository _repo;

    public CustomersServiceController(ICustomersRepository repo) {
      _repo = repo;
    }

}
```

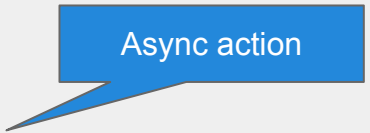
Instance injected at runtime

Adding an Action and Route

Web API actions can return a custom type or ActionResult

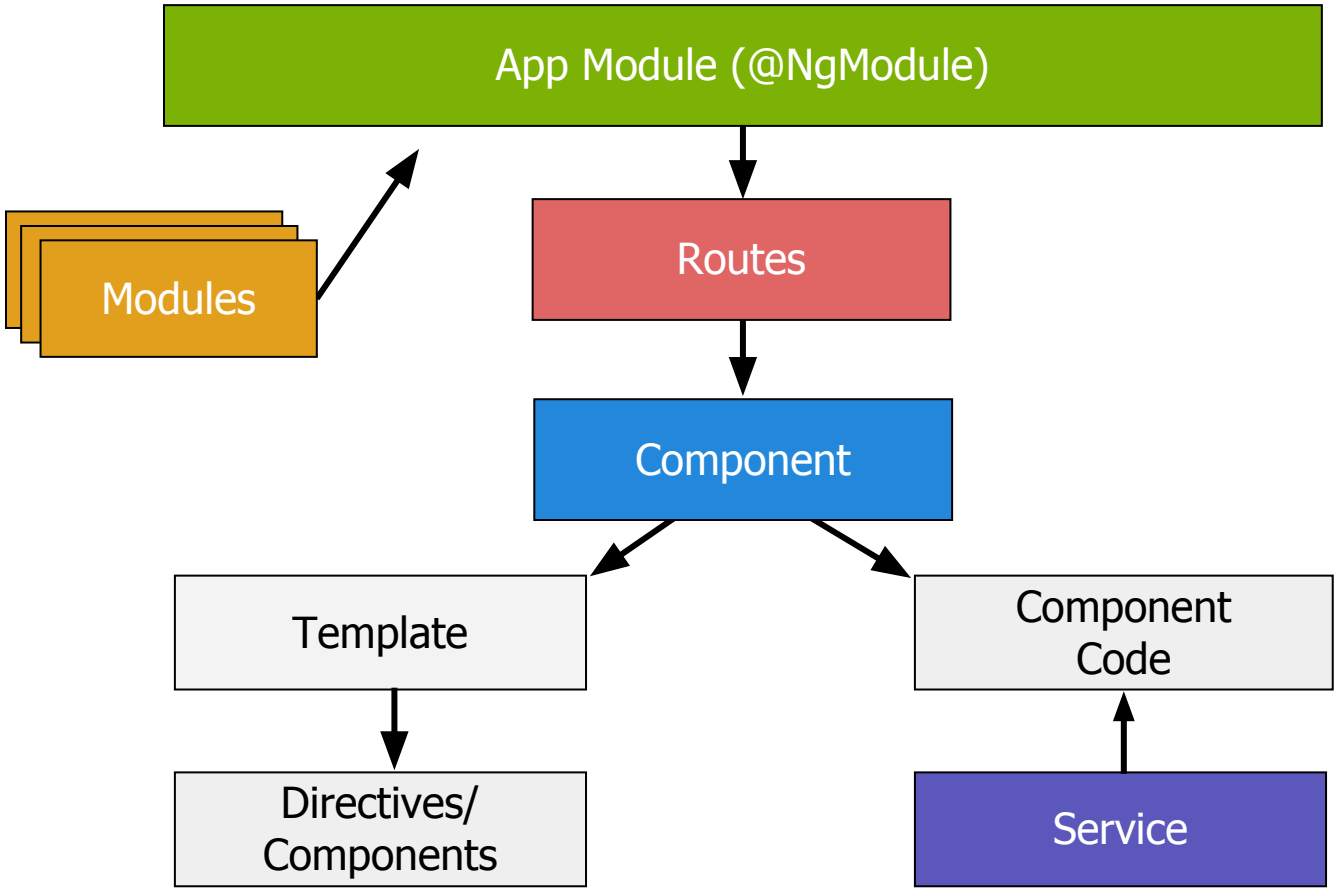
CustomersController.cs

```
[Route("api/[controller]")]
public class CustomersController : Controller
{

    ICustomersRepository _repo;

    [HttpGet("{id}")]
    public async Task<ActionResult> Get(int id)
    {
        var customer = await _repo.GetCustomerAsync(id);
        if (customer == null) {
          return NotFound("No customer found!");
        }
        return Ok(customer);
    }
}
```



Angular Services

Angular - The Big Picture



How Do You Integrate Angular Into an ASP.NET Core Project?

- Use an Angular/ASP.NET Core Seed Project
- Use the dotnet CLI:

```
dotnet new --install Microsoft.AspNetCore.SpaTemplates::*
```

- Use the Angular CLI

```
ng new [project_name] -sd wwwroot -dir .
```

Angular Services

Services are reusable classes that handle business rules, calculations, Ajax calls, etc.

data.service.ts

```
import { Injectable } from '@angular/core';
import { Http } from '@angular/http';

@Injectable()
export class DataService {
   constructor(private http: Http) { }
}
```

Supports injectables

Injected at runtime

Angular Async Operations

- Services that perform asynchronous operations can use Promises or Observables

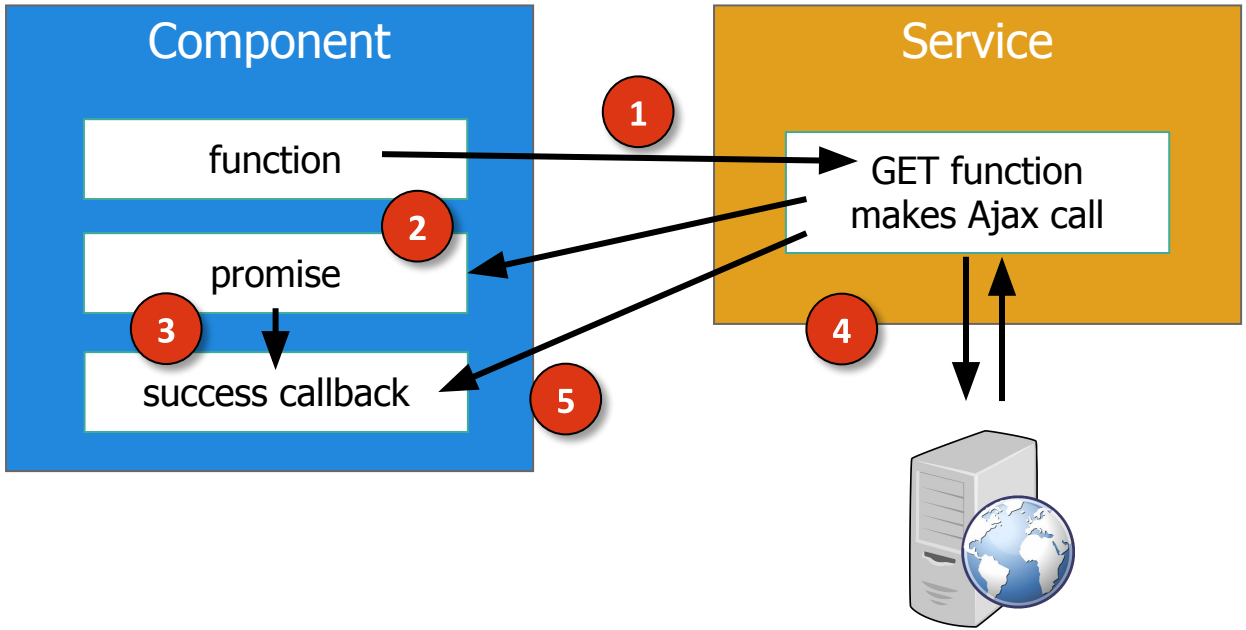
- Promise:
  - An operation that hasn't completed yet, but is expected in the future
  - Used with async/deferred operations
  - Can be hooked to a callback

- Observable
  - An object that can be “subscribed” to by other objects
  - Can return multiple values over time – an async data stream
  - Event based

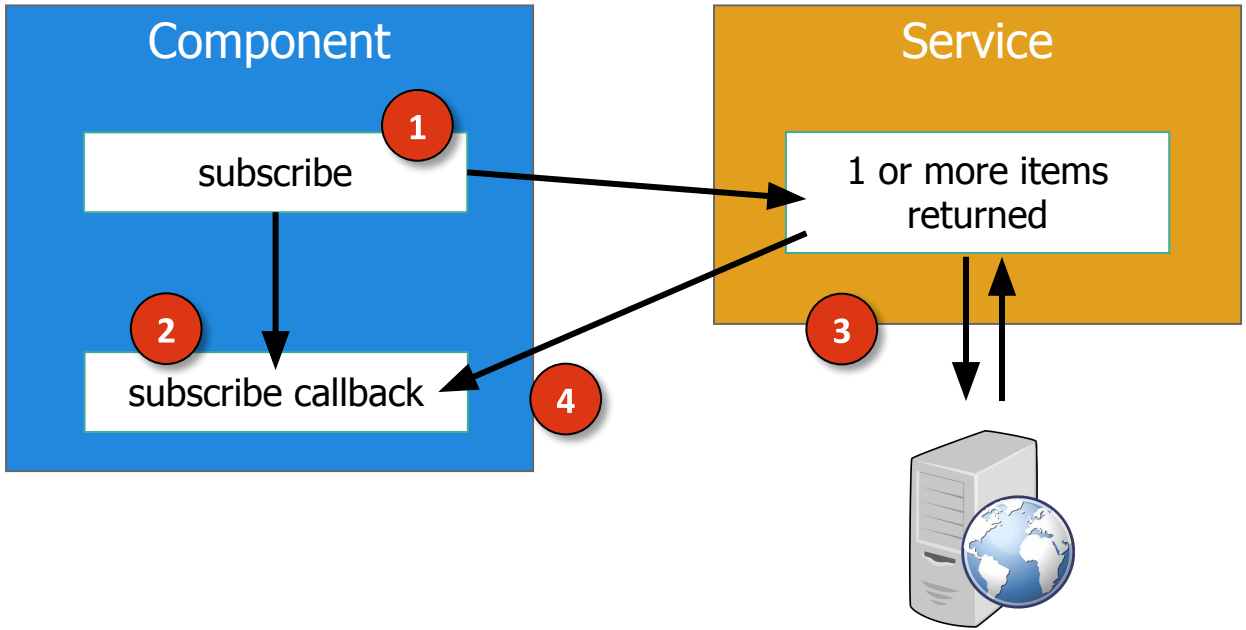
Observables versus Promises

Promise	Observable
Returns a single value	Can return multiple values over time (think of an array into the future)
Cannot cancel	Can cancel
	Supports standard array functions (map, filter, reduce, etc.)

Promises in Action



Observables in Action



Using Http to Call RESTful Services

RESTful services can be called using Http

data.service.ts

```
import { Http } from '@angular/http';
import { Observable } from 'rxjs/Rx';
import 'rxjs/add/operator/map;
import 'rxjs/add/operator/catch';

@Injectable()
export class DataService {
   constructor(private http: Http) { }

   getCustomers() : Observable<ICustomer[]> {
       return this.http.get('api/customers')
                       .map((response: Response) => response.json())
                       .catch(this.handleError);
   }
}
```

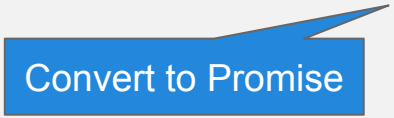
Map response to customers

Http and Promises

Create a promise by calling toPromise()

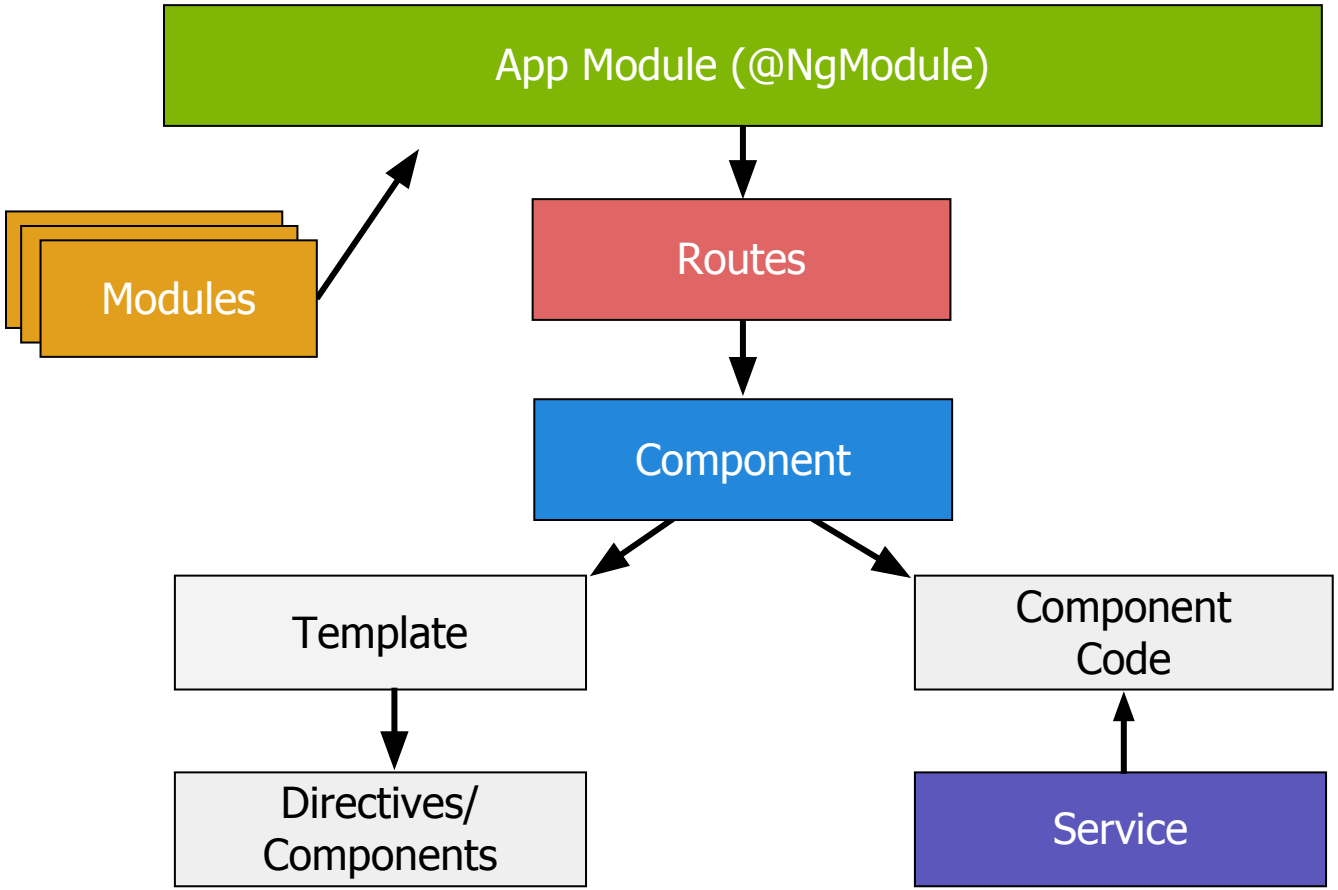
data.service.ts

```
import { Http } from '@angular/http';
import 'rxjs/add/operator/toPromise';
import 'rxjs/add/operator/catch';

@Injectable()
export class DataService {
   constructor(private http: Http) { }

   getCustomers() : Promise<ICustomer[]> {
       return this.http.get('api/customers')
                   .toPromise()
                   .then((response: Response) => response.json())
                   .catch(this.handleError);
   }
}
```

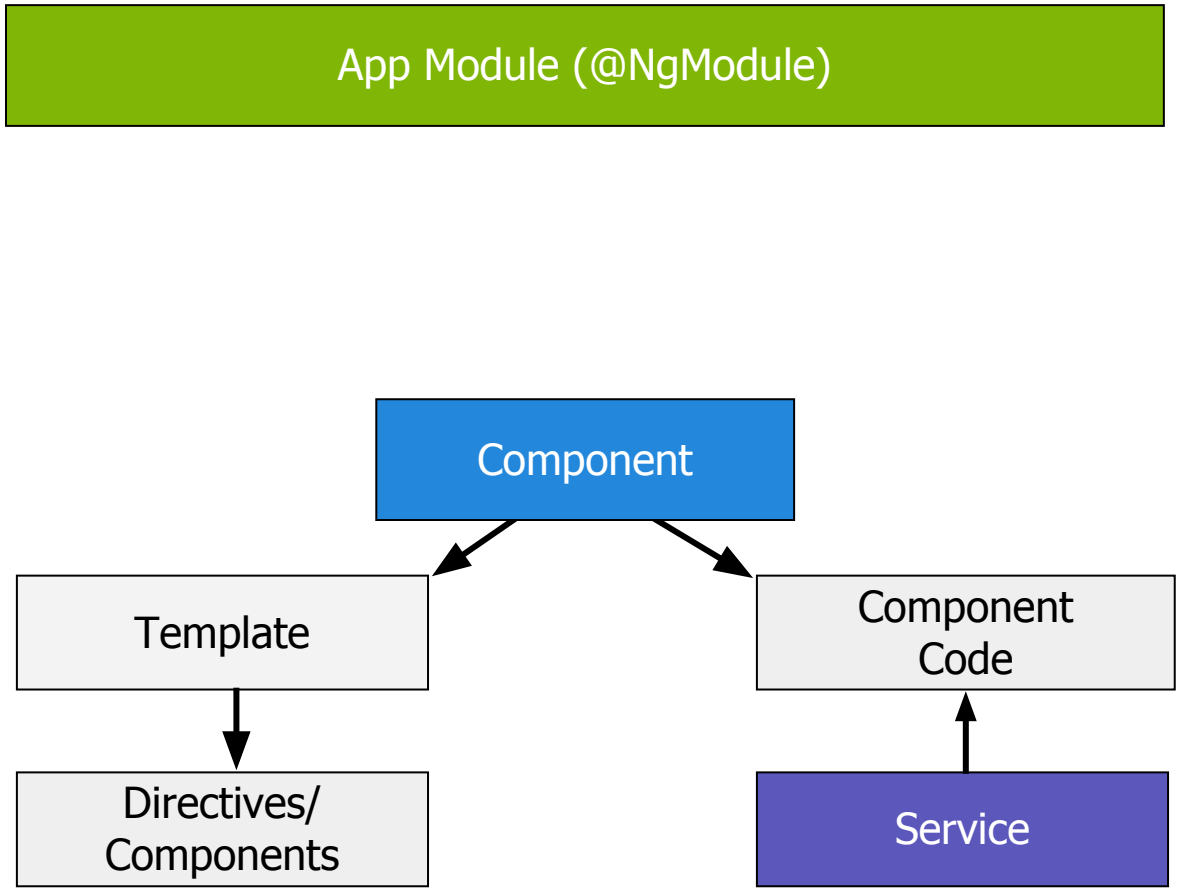


Injecting Services into Components

Angular - The Big Picture



Angular - The Big Picture



Defining a Service Provider

- Services can be injected when a ***provider*** has been defined in a component or in an @NgModule

app.module.ts

```
import { DataService } from './shared/data.service';

@NgModule({
  imports:      [ BrowserModule, HttpModule ],
  declarations: [ AppComponent, CustomersComponent ],
  providers:    [ DataService ],
  bootstrap:    [ AppComponent ]
})
export class AppModule { }
```

Injecting a Service into a Component

Services are "provided" to components

customers.component.ts

```
import { DataService } from '../shared/data.service';
@Component({
  ...
})
export class CustomersComponent implements OnInit {
   customers: Customer[];
   constructor(private dataService: DataService) { }
   ngOnInit() {
     this.dataService.getCustomers()
           .subscribe((customers: Customer[]) => {
               this.customers = customers;
           });
   }
}
```

Angular and ASP.NET Core

https://github.com/DanWahlin/Angular-ASPNET-Core-Seed
https://github.com/DanWahlin/AspNetCorePostgreSQLDockerApp
https://github.com/DanWahlin/Angular-ASPNET-Core-CustomersService
https://github.com/DanWahlin/ASPNETCore-Sync-Async-EF

Angular Projects:

http://codewithdan.me/angular-10-projects

Thanks for Coming!

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