

# Communicating Through a Service

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A man with short brown hair, wearing a light blue denim shirt over a dark grey t-shirt, is smiling and pointing his right index finger towards another person. The second person, seen from the back, has dark curly hair and is wearing a light blue shirt. They are in a modern interior with a white brick fireplace and a dark grey wall in the background. A speech bubble is positioned above the man's head.

**Yea!**  
**You've got this**  
**component!**

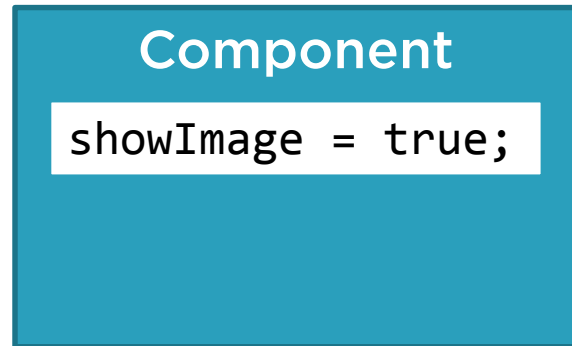




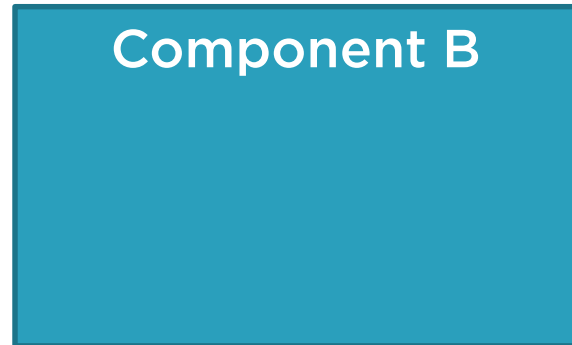
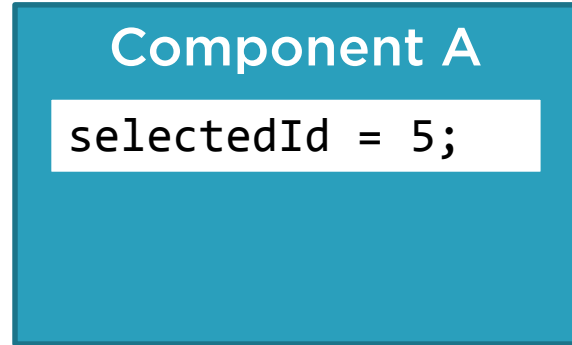
Let's move the  
party to my  
place!



# Communicating Through a Service



# Communicating Through a Service



# Module Overview



## Managing State

### Property Bag Service

- Communication with Itself
- Communication with Others

### Service Scope and Lifetime

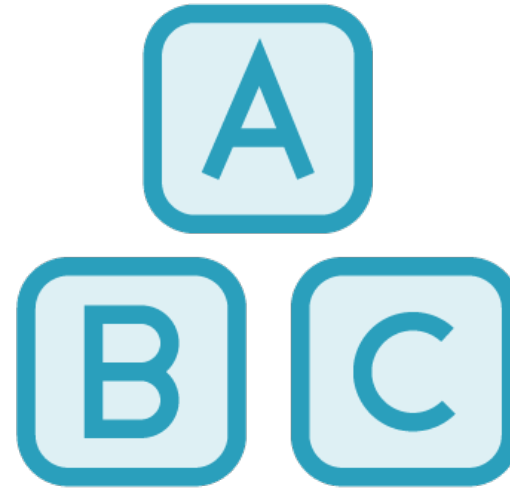
# What Is State?



View State



User  
Information



Entity Data



User Selection  
and Input

...





# Managing State

## Property Bag

```
@Injectable()
export class ParamService {
  showImage: boolean;
  filterBy: string;
}
```

## Basic State Management

```
@Injectable()
export class ProductService {
  private products: IProduct[];

  getProducts() {}
  getProduct(id: number): IProduct {
    ...
  }
}
```

## State Management with Notifications

```
@Injectable()
export class ProductService {
  private selectedProduct: IProduct;

  private selectedProductSource =
    new BehaviorSubject<IProduct>();
  selectedProductChanges$ =
    this.selectedProductSource.asObservable();
  ...
}
```

## ngrx/Redux

State:  
Immutable



Will you keep  
track of my  
current filter?

Sure!  
Retaining your  
current filter.

What was my  
filter?

I have it. Here  
you go ...

Component  
A

Service



## Product List

Filter by:

Filtered by: none Hits:5

[Show Image](#)

Product	Code	Available	Price	5 Star Rating	
Leaf Rake	gdn-0011	March 19, 2016	\$19.95	★★★	<a href="#">Edit</a>
Garden Cart	gdn-0023	March 18, 2016	\$32.99	★★★★	<a href="#">Edit</a>
Hammer	tbx-0048	May 21, 2016	\$8.90	★★★★★	<a href="#">Edit</a>
Saw	tbx-0022	May 15, 2016	\$11.55	★★★★	<a href="#">Edit</a>
Video Game Controller	gmg-0042	October 15, 2015	\$35.95	★★★★★	<a href="#">Edit</a>



## Product List

Filter by:

Filtered by: me Hits:2

[Show Image](#)**Product****Code****Available****Price****5 Star Rating**

Hammer

tbx-0048

May 21, 2016

\$8.90

★★★★★

[Edit](#)

Video Game Controller

gmg-0042

October 15, 2015

\$35.95

★★★★☆

[Edit](#)

## Product List

Filter by:

Filtered by: me Hits:2

[Hide Image](#)

Product

Code

Available

Price

5 Star Rating



Hammer

tbx-0048

May 21, 2016

\$8.90

★★★★★

[Edit](#)

Video Game Controller

gmg-0042

October 15, 2015

\$35.95

★★★★★

[Edit](#)



## Product Detail: Hammer

Name: Hammer  
Code: tbx-0048  
Description: Curved claw steel hammer  
Availability: May 21, 2016  
Price: \$8.90  
5 Star Rating: ★★★★★



◀ Back

Edit

## Product List

Filter by:

Filtered by: none Hits:5

[Show Image](#)

Product	Code	Available	Price	5 Star Rating	
Leaf Rake	gdn-0011	March 19, 2016	\$19.95	★★★	<a href="#">Edit</a>
Garden Cart	gdn-0023	March 18, 2016	\$32.99	★★★★	<a href="#">Edit</a>
Hammer	tbx-0048	May 21, 2016	\$8.90	★★★★★	<a href="#">Edit</a>
Saw	tbx-0022	May 15, 2016	\$11.55	★★★★	<a href="#">Edit</a>
Video Game Controller	gmg-0042	October 15, 2015	\$35.95	★★★★★	<a href="#">Edit</a>





Acme Product ManagementHomeProduct ListAdd ProductWelcome DeborahLog Out

Product List

Filter by:

Filtered by: me Hits:2

Hide Image

	Product	Code	Available	Price	5 Star Rating	
	Hammer	tbx-0048	May 21, 2016	\$8.90	★★★★★	<div>Edit</div>
	Video Game Controller	gmg-0042	October 15, 2015	\$35.95	★★★★★	<div>Edit</div>

Product List Component

```
export class ProductListComponent {  
  showImage: boolean;  
  listFilter: string;  
  ...  
}
```

true

me



Product Detail: Hammer

Name: Hammer  
Code: tbx-0048  
Description: Curved claw steel hammer  
Availability: May 21, 2016  
Price: \$8.90  
5 Star Rating: ★★★★★



[← Back](#)   [Edit](#)





Acme Product ManagementHomeProduct ListAdd ProductWelcome DeborahLog Out

Product List

Filter by:

Filtered by: none Hits:5

Show Image

Product	Code	Available	Price	5 Star Rating	
Leaf Rake	gdn-0011	March 19, 2016	\$19.95	★ ★ ★ ·	Edit
Garden Cart	gdn-0023	March 18, 2016	\$32.99	★ ★ ★ ★ ·	Edit
Hammer	tbx-0048	May 21, 2016	\$8.90	★ ★ ★ ★ ★	Edit
Saw	tbx-0022	May 15, 2016	\$11.55	★ ★ ★ ★	Edit
Video Game Controller	gmg-0042	October 15, 2015	\$35.95	★ ★ ★ ★ ★	Edit

Product List Component

```
export class ProductListComponent {  
  showImage: boolean;  
  listFilter: string;  
  ...  
}
```

undefined

undefined



Acme Product Management

Home

Product List

Add Product

Welcome Deborah

Log Out

Product List

Filter by:

Filtered by: none Hits:5

Show Image

Product	Code	Available	Price	5 Star Rating	
Leaf Rake	gdn-0011	March 19, 2016	\$19.95	★ ★ ★ ·	Edit
Garden Cart	gdn-0023	March 18, 2016	\$32.99	★ ★ ★ ★ ·	Edit
Hammer	tbx-0048	May 21, 2016	\$8.90	★ ★ ★ ★ ★	Edit
Saw	tbx-0022	May 15, 2016	\$11.55	★ ★ ★ ★ ★	Edit
Video Game Controller	gmg-0042	October 15, 2015	\$35.95	★ ★ ★ ★ ★	Edit

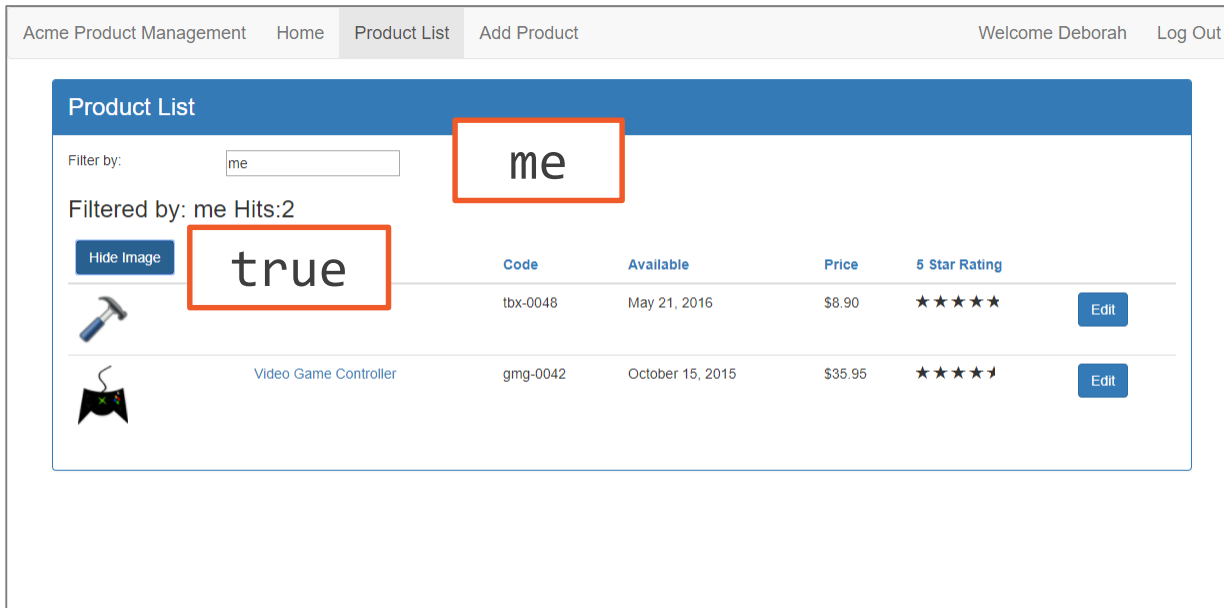
## Product List Component

```
export class ProductListComponent {
  showImage: boolean;
  listFilter: string;

  ...
}
```

## Service

```
@Injectable()
export class ParamService {
  showImage: boolean;
  filterBy: string;
}
```

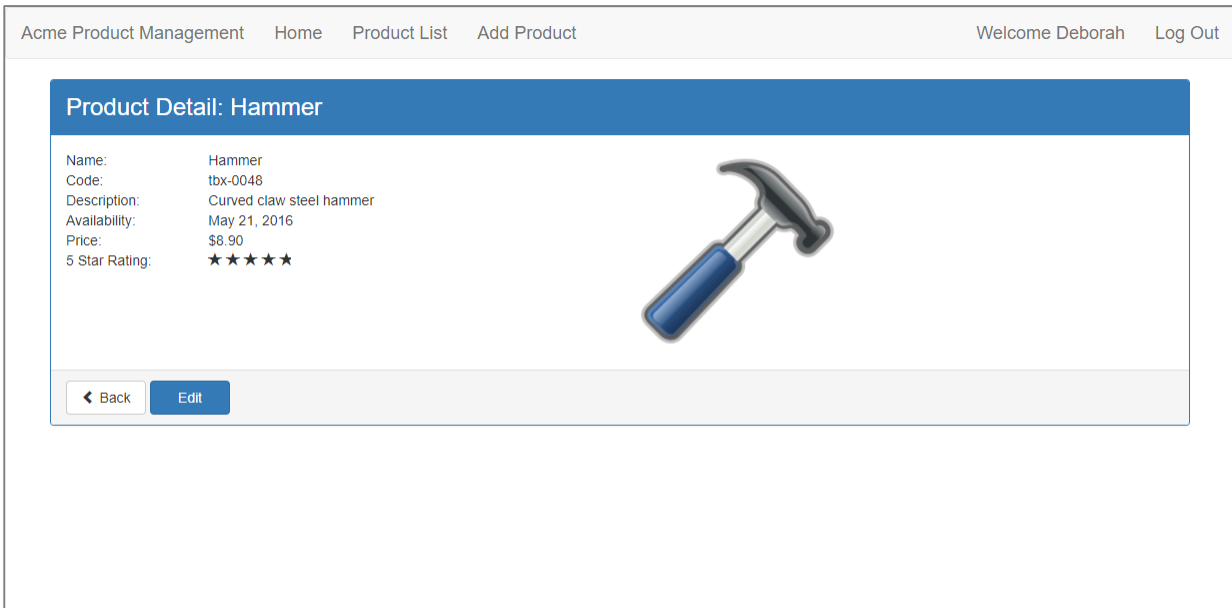


## Product List Component

```
export class ProductListComponent {  
  get showImage(): boolean {  
    return this.paramService.showImage;  
  }  
  set showImage(value: boolean) {  
    this.paramService.showImage = true  
  }  
  get listFilter(): string {  
    return this.paramService.filterBy;  
  }  
  set listFilter(value: string) {  
    this.paramService.filterBy = me  
  }  
}
```

## Service

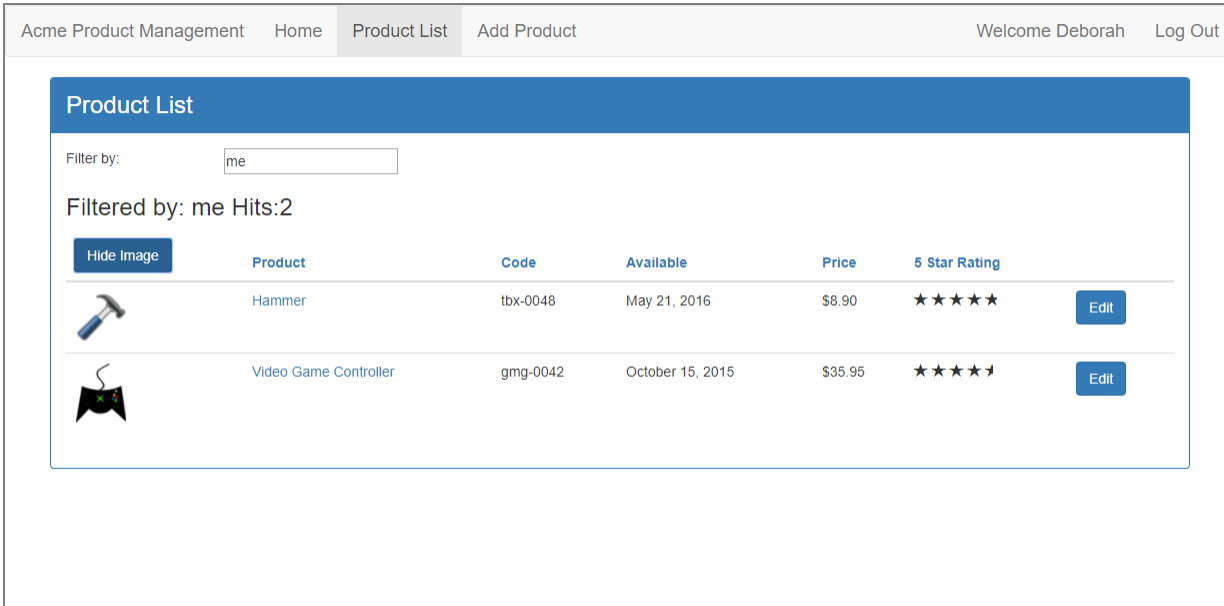
```
@Injectable()  
export class ParamService {  
  showImage: boolean;  
  filterBy: string;  
}
```



## Service

```
@Injectable()
export class ParamService {
  showImage: boolean; true
  filterBy: string; me
}
```





## Product List Component

```
export class ProductListComponent {  
  get showImage(): boolean {  
    return this.paramService.showImage; true  
  }  
  set showImage(value: boolean) {  
    this.paramService.showImage = value;  
  }  
  get listFilter(): string {  
    return this.paramService.filterBy; me  
  }  
  set listFilter(value: string) {  
    this.paramService.filterBy = value;  
  }  
}
```

## Service

```
@Injectable()  
export class ParamService {  
  showImage: boolean; true  
  filterBy: string; me  
}
```

# Services

Provide  
functionality  
across  
components

## Examples:

- Logging
- Calculations
- Data access
- Data sharing
- ...

Register it  
with the  
Angular  
injector

Inject into  
any  
component  
that needs it

Singletons



# Property Bag Service



Acme Product Management   Home   **Product List**   Add Product   Welcome Deborah   Log Out

**Product List**

Filter by:

Filtered by: me Hits:2

Hide Image

	Product	Code	Available	Price	5 Star Rating	
	Hammer	tbx-0048	May 21, 2016	\$8.90	★★★★★	<div>Edit</div>
	Video Game Controller	gmg-0042	October 15, 2015	\$35.95	★★★★☆	<div>Edit</div>

## Service

```
@Injectable()
export class ParamService {
  showImage: boolean;
  filterBy: string;
}
```



# Property Bag Service

## Product Search

**Product Name**

**Product Code**

**Availability Date Range**

**Start**

**End**

## Product List

Product	Code	Available	Price	5 Star Rating	
Video Game Controller	gmg-0042	October 15, 2015	\$35.95	★★★★★	<input type="button" value="Edit"/>

## Service

```
@Injectable()
export class ParamService {
  productName: string;
  productCode: string;
  startDate: string;
  endDate: string;
}
```





# Property Bag Service

## Service

```
@Injectable()
export class ParamService {
  showImage: boolean;
  filterBy: string;
}
```

## Service

```
@Injectable()
export class ParamService {
  productName: string;
  productCode: string;
  startDate: string;
  endDate: string;
}
```



# Registering a Service

## product.component.ts

```
@Component({
  templateUrl: './product-list.component.html',
  styleUrls: ['./product-list.component.css'],
  providers: [ ProductService ]
})
export class ProductListComponent {
  pageTitle: string = 'Product List';
  includeDetail: boolean = true;

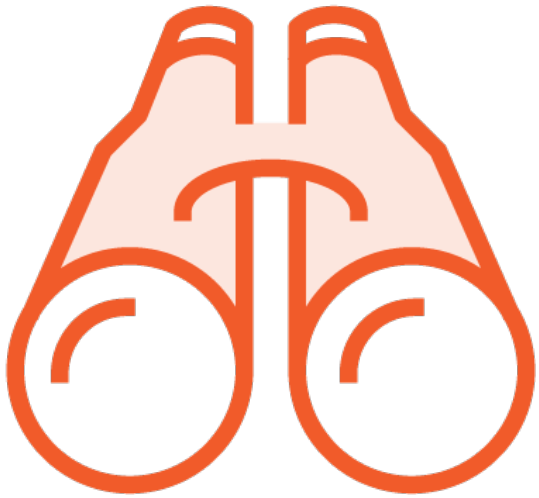
  ...
}
```

## product.module.ts

```
@NgModule({
  ...,
  declarations: [
    ProductListComponent,
    ProductDetailComponent,
    ProductEditComponent
  ],
  providers: [
    ProductService,
    ProductEditGuard,
    ProductParameterService
  ]
})
export class ProductModule { }
```



# Service Scope and Lifetime



**Service Scope**



**Service Lifetime**

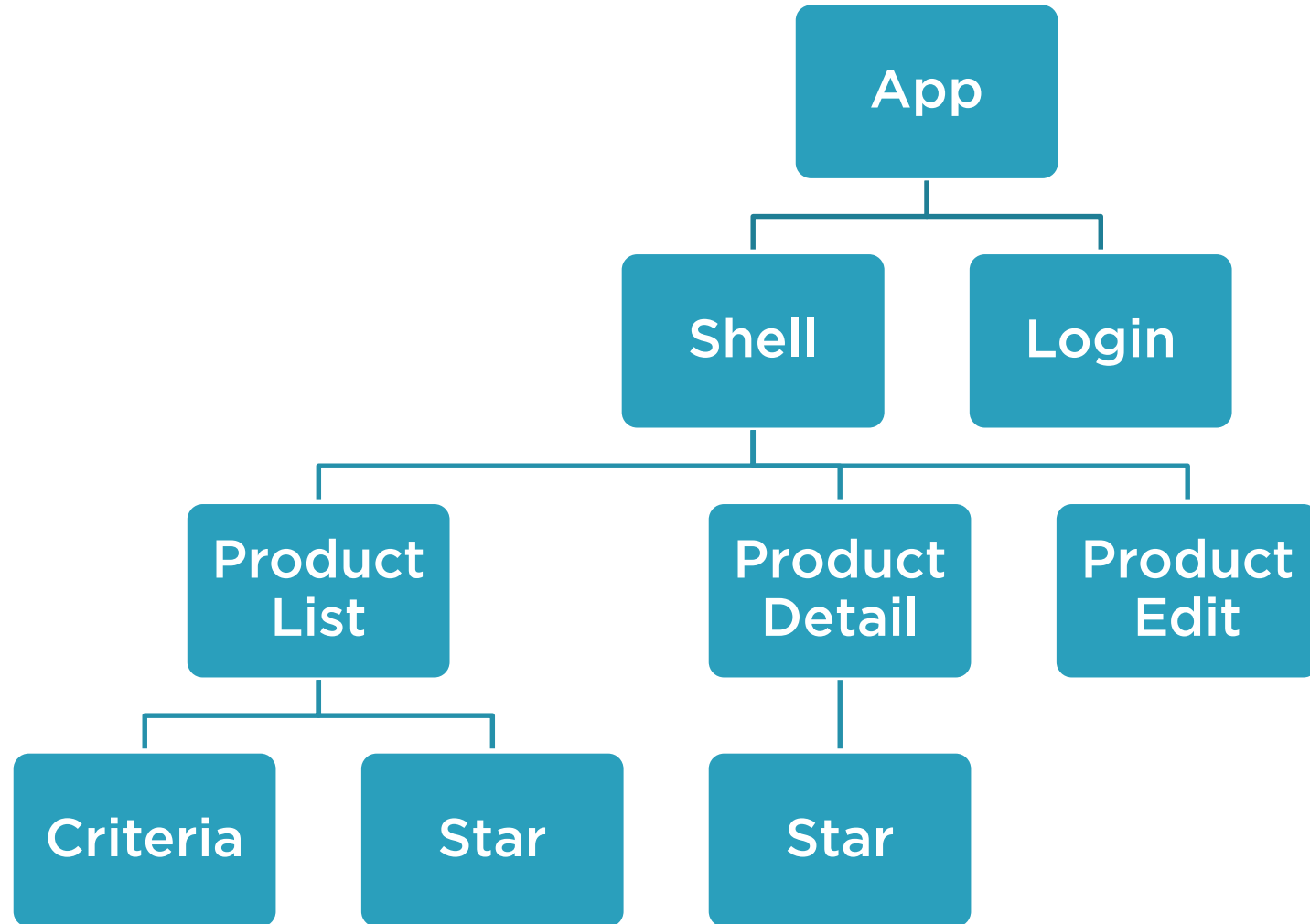
# Registering in a Component

product.component.ts

```
@Component({  
  templateUrl: './product-list.component.html',  
  styleUrls: ['./product-list.component.css'],  
  providers: [ ProductService ]  
})  
export class ProductListComponent {  
  pageTitle: string = 'Product List';  
  includeDetail: boolean = true;  
  
  ...  
}
```

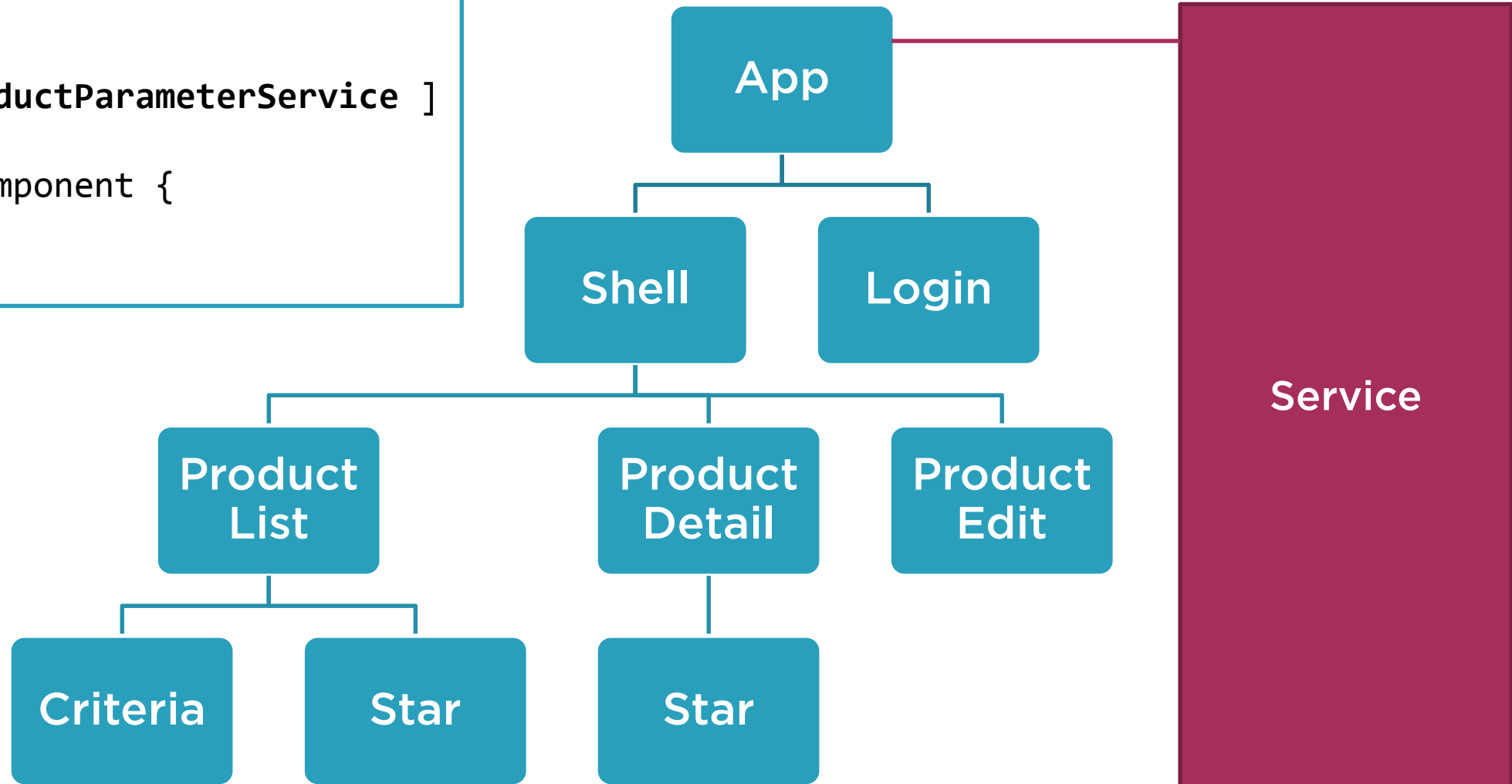


# Component Hierarchy



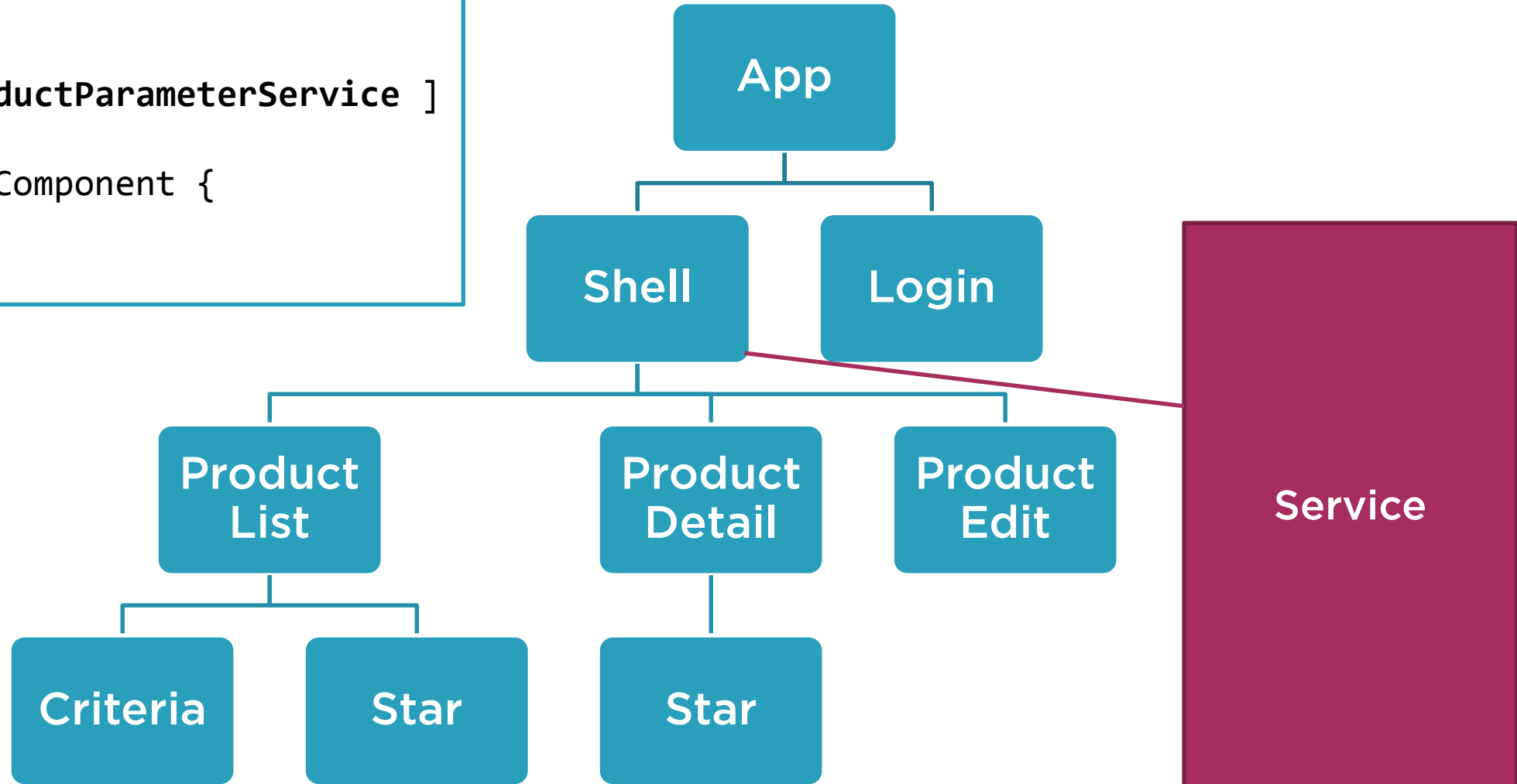
# Registering in a Component

```
@Component({  
  ...  
  providers: [ ProductParameterService ]  
})  
export class AppComponent {  
  ...  
}
```



# Registering in a Component

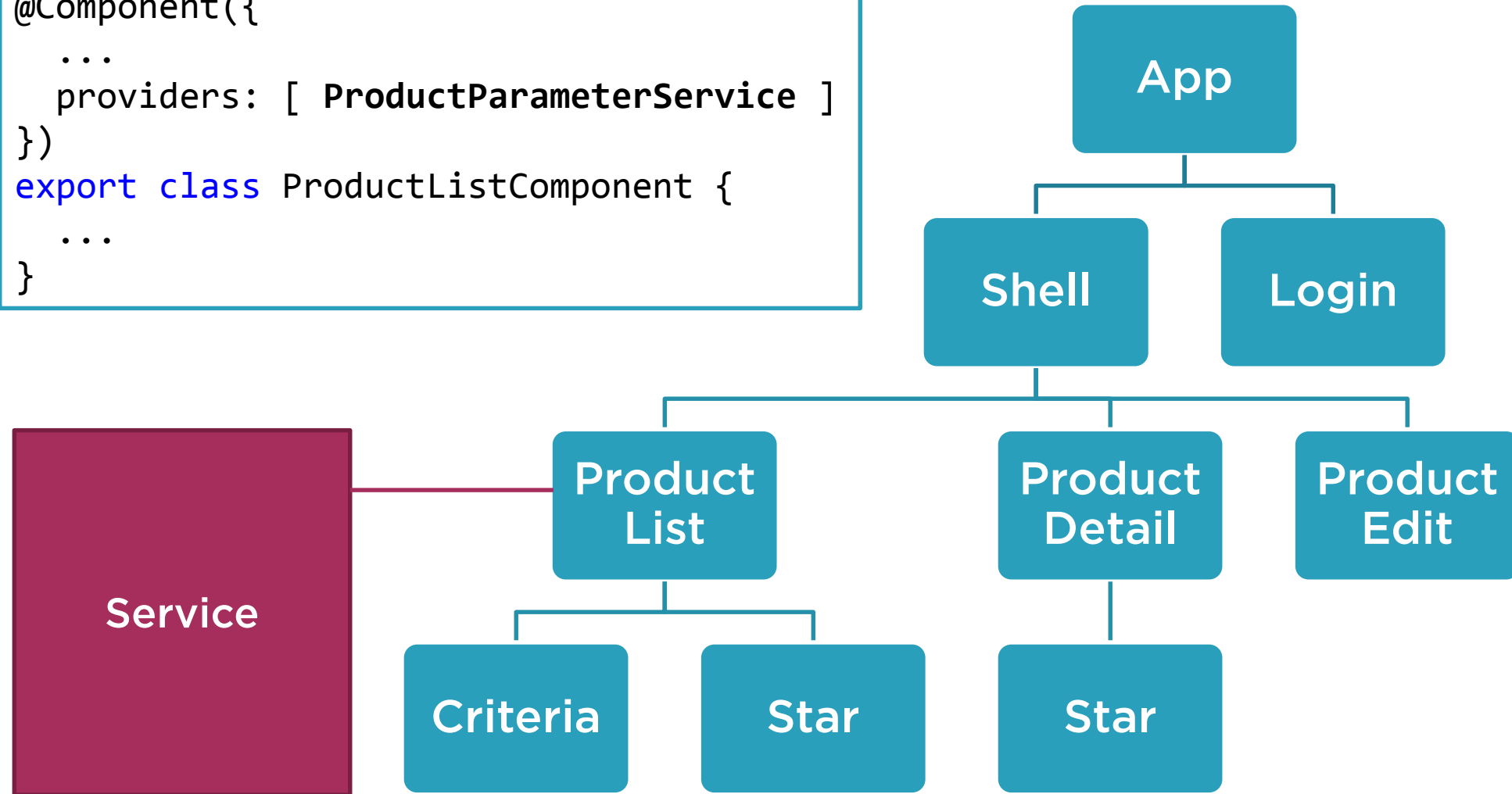
```
@Component({  
  ...  
  providers: [ ProductParameterService ]  
})  
export class ShellComponent {  
  ...  
}
```





# Registering in a Component

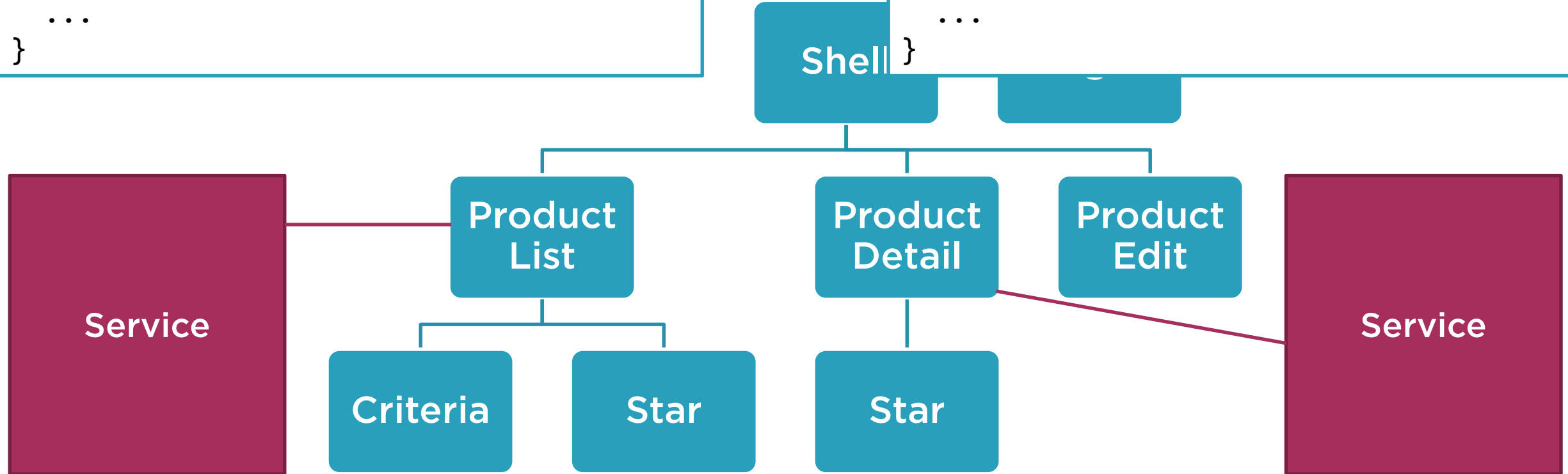
```
@Component({  
  ...  
  providers: [ ProductParameterService ]  
})  
export class ProductListComponent {  
  ...  
}
```



# Registering in a Component

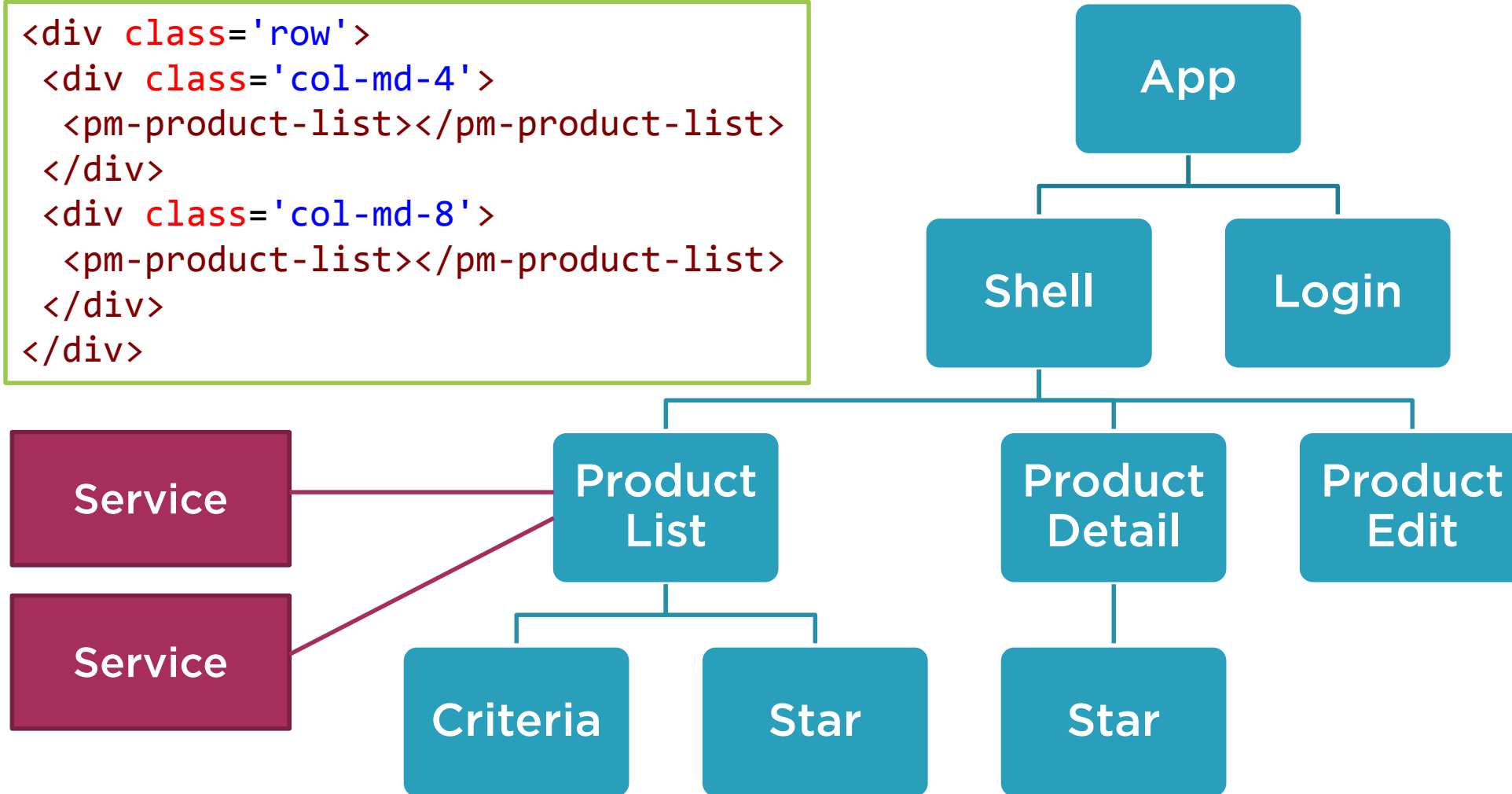
```
@Component({  
  ...  
  providers: [ ProductParameterService ]  
})  
export class ProductListComponent {  
  ...  
}
```

```
@Component({  
  ...  
  providers: [ ProductParameterService ]  
})  
export class ProductDetailComponent {  
  ...  
}
```



# Multiple Instances

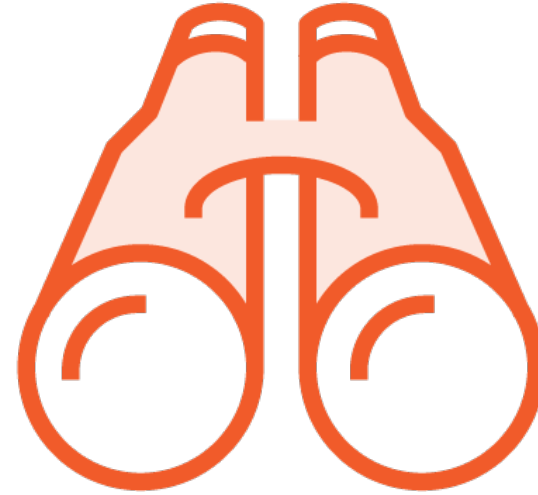
```
<div class='row'>  
  <div class='col-md-4'>  
    <pm-product-list></pm-product-list>  
  </div>  
  <div class='col-md-8'>  
    <pm-product-list></pm-product-list>  
  </div>  
</div>
```



# Registering in a Component

## product.component.ts

```
@Component({  
  templateUrl: './product-list.component.html',  
  styleUrls: ['./product-list.component.css'],  
  providers: [ ProductService ]  
})  
export class ProductListComponent {  
  pageTitle: string = 'Product List';  
  includeDetail: boolean = true;  
  
  ...  
}
```



Service  
Scope



Service  
Lifetime



# Monitoring Service Lifetime

```
@Injectable()
export class ProductParameterService implements OnDestroy {
  showImage: boolean;
  filterBy: string;

  constructor() {
    console.log('Service created');
  }

  ngOnDestroy(): void {
    console.log('Service destroyed');
  }
}
```



# Registering in a Module

## product.component.ts

```
@Component({
  templateUrl: './product-list.component.html',
  styleUrls: ['./product-list.component.css'],
  providers: [ ProductService ]
})
export class ProductListComponent {
  pageTitle: string = 'Product List';
  includeDetail: boolean = true;

  ...
}
```

## product.module.ts

```
@NgModule({
  ...,
  declarations: [
    ProductListComponent,
    ProductDetailComponent,
    ProductEditComponent
  ],
  providers: [
    ProductService,
    ProductEditGuard,
    ProductParameterService
  ]
})
export class ProductModule { }
```



# Guidelines & Summary: Communicating through a Service

---





# Property Bag: Communication with Itself

## Great for:

- Retaining view state
- Retaining user selections

## Note:

- Any component can read the values
- Any component can change the values



# Property Bag: Communication with Others

## Great for:

- Sharing data or other state
- Communicating state changes

## Note:

- Any component can read the values
- Any component can change the values
- Components are only notified of state changes if they use template binding



# Service Scope and Lifetime

## Register service in a module or root App component:

- Available to all components
- Available for the lifetime of the application

## Register service in any other component:

- Injects a separate instance for each instance of the component

## Register service in a lazy loaded module:

- Available only to components within the module
- Available for the lifetime of the application

## Register service in any other component:

- Available only to that component and all of its children
- Available for the lifetime of the component



# Summary



## Managing State

### Property Bag Service

- Communication with Itself
- Communication with Others

### Service Scope and Lifetime

# Managing State



```
@Injectable()  
export class ParamService {  
  showImage: boolean;  
  filterBy: string;  
}
```

