

# Communicating Through Service Notifications

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**The user just logged out!**



# Managing State

Property  
Bag

Basic State  
Management

State  
Management  
with  
Notifications

ngrx/Redux

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

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



# Module Overview



## Broadcasting Service Notifications

- EventEmitter
- Subject
- BehaviorSubject



# Displaying Concurrent Components


[Acme Product Management](#) [Home](#) [Product List](#) [Add Product](#) Welcome Deborah [Log Out](#)

## Products

- Leaf Rake (GDN-0011)
- Garden Cart (GDN-0023)
- Hammer (TBX-0048)
- Saw (TBX-0022)
- Video Game Controller (GMG-0042)

## Product Detail: Hammer

Name: Hammer  
Code: TBX-0048  
Description: Curved claw steel hammer  
Availability: May 21, 2017  
Price: \$8.90  
5 Star ★★★★★  
Rating:



[Edit](#)



# Sharing Data (Pull)

## Detail Component

```
export class ProductDetailComponent {  
  get product(): IProduct {  
    return this.ps.currentProduct;  
  }  
  ...  
}
```

## List Component

```
onSelected(product: IProduct) {  
  this.ps.currentProduct = product;  
}
```

Hammer

## Service

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

Hammer



The user  
just picked  
a new value!

I'll notify  
everyone who  
subscribed.

I got your  
notification. I'll  
adjust my display.



Component  
A


Service

Component  
B



# Notifications (Push)

Products	
Leaf Rake (GDN-0011)	
Garden Cart (GDN-0023)	
Hammer (TBX-0048)	
Saw (TBX-0022)	
Video Game Controller (GMG-0042)	

Product Detail: Saw	
Name:	Saw
Code:	tbx-0022
Description:	15-inch steel blade hand saw
Availability:	May 15, 2017
Price:	\$11.55
5 Star Rating:	★★★★
	
<button>Edit</button>	

## List Template

```
<button type='button'
  *ngFor='let product of products'
  (click)='onSelected(product)'>
```

## List Component

```
onSelected(product: IProduct) {
  this.productService.changeSelectedProduct(product);
}
```

## Service

```
changeSelectedProduct(selectedProduct: IProduct) {
  // Broadcast the notification
}
```

## Component or Service

```
// Listen for and respond to the notification
```



# Event Emitter

## Parent Template

```
<pm-criteria  
  [displayDetail]='includeDetail'  
  (valueChange)='onValueChange($event)'>  
</pm-criteria>
```

## Child Component

```
export class CriteriaComponent {  
  
  @Output() valueChange: EventEmitter<string> =  
    new EventEmitter<string>();  
  
  private _listFilter: string;  
  get listFilter(): string {  
    return this._listFilter;  
  }  
  set listFilter(value: string) {  
    this._listFilter = value;  
    this.valueChange.emit(value);  
  }  
}
```



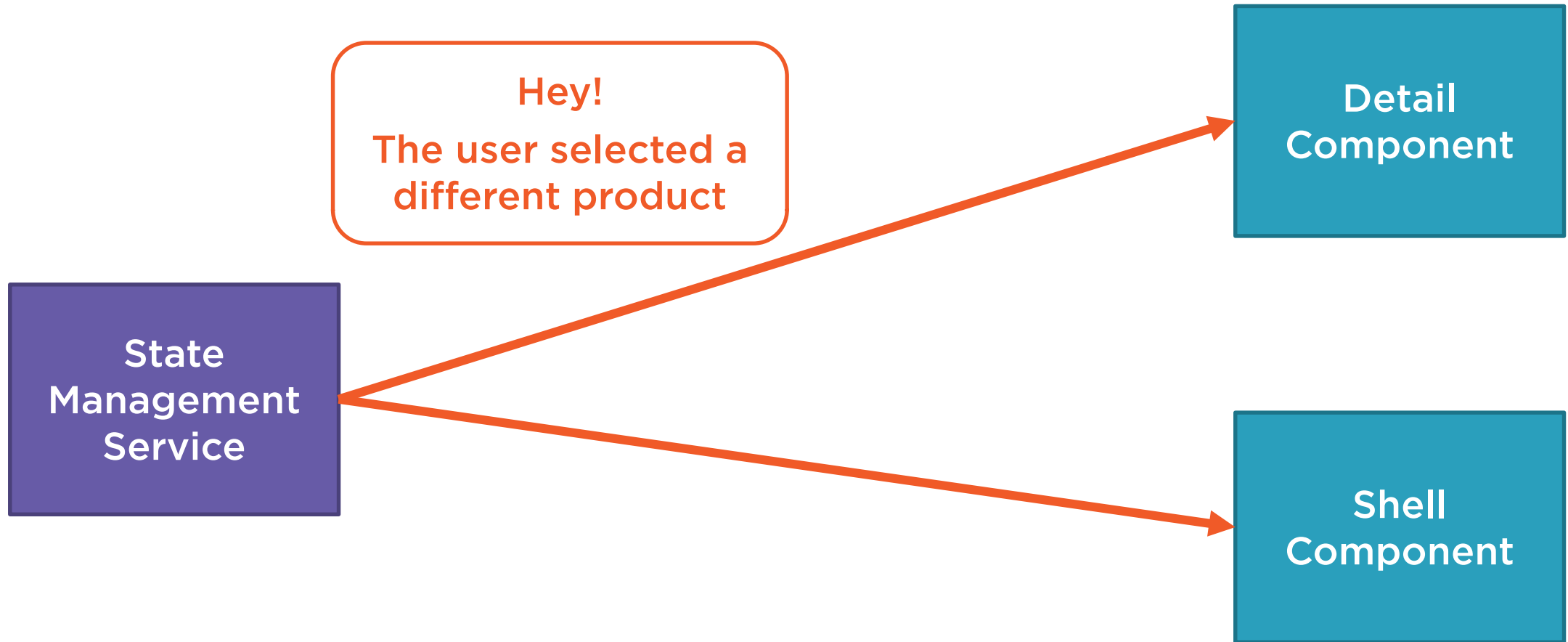
# Service Notifications

**Subject**

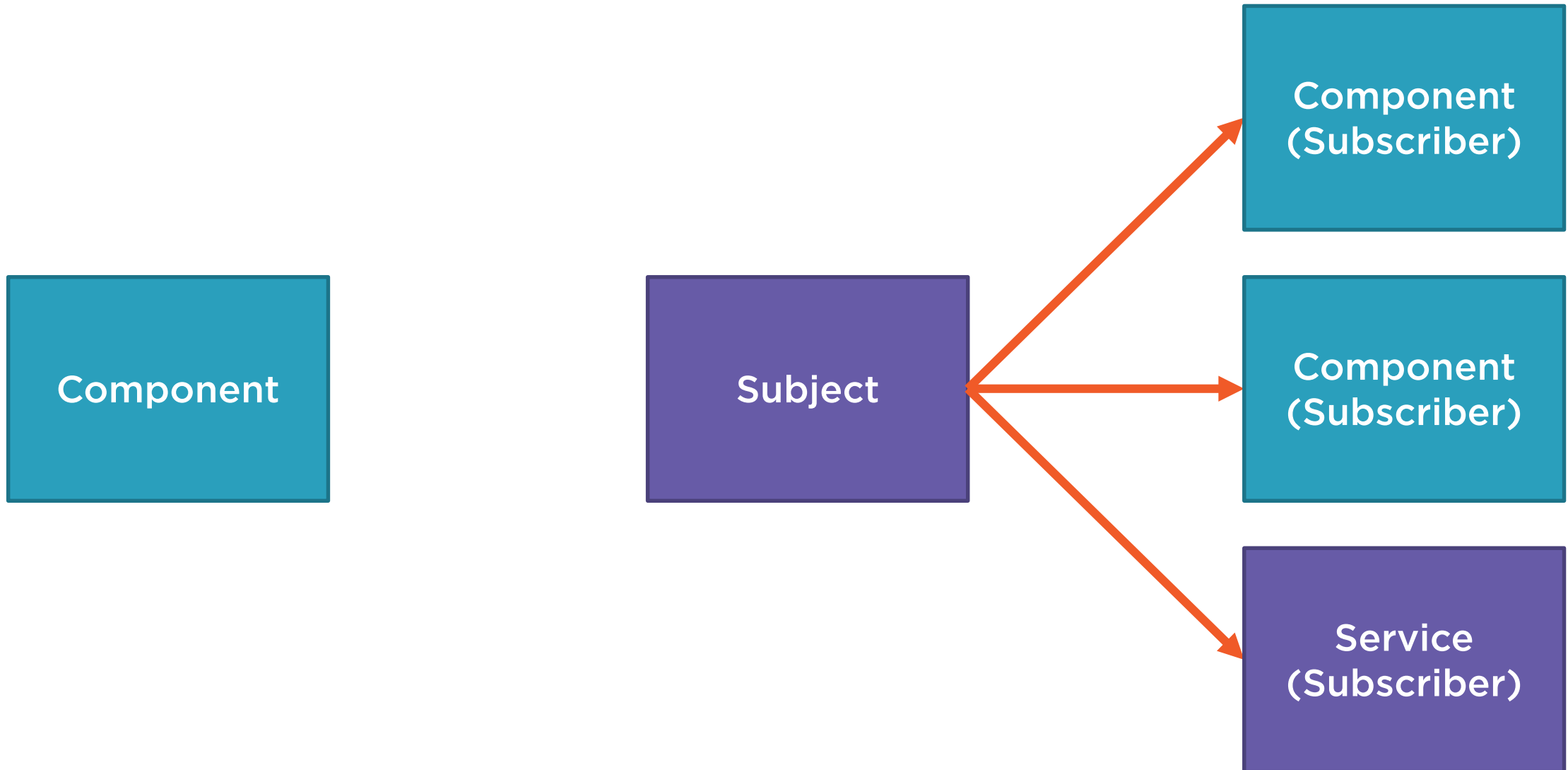
**BehaviorSubject**



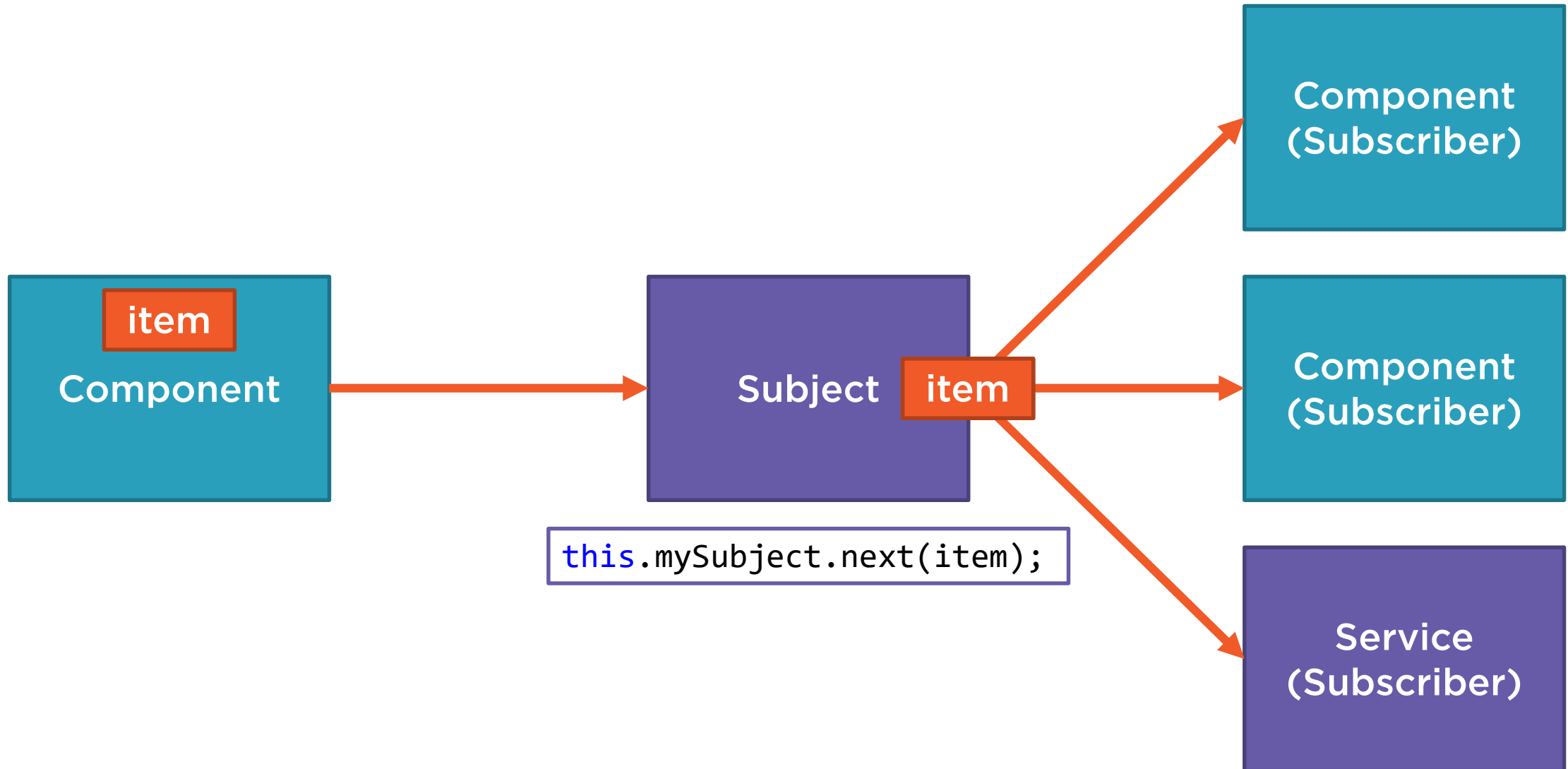
# Subject



# Subject: Observable



# Subject: Observer



## Products

[Garden Cart \(GDN-0023\)](#)[Hammer \(TBX-0048\)](#)[Leaf Rake \(GDN-0011\)](#)[Saw \(TBX-0022\)](#)[Video Game Controller \(GMG-0042\)](#)

## Product Detail: Garden Cart

Name: Garden Cart

Code: gdn-0023

Description: 15 gallon capacity  
rolling garden cart

Availability: March 18, 2017

Price: \$32.99

5 Star ★★★★★


Rating:

[Edit](#)

Products
Leaf Rake (GDN-0011)
Garden Cart (GDN-0023)
Hammer (TBX-0048)
Saw (TBX-0022)
Video Game Controller (GMG-0042)

## List Template

```
<button type='button'
*ngFor='let product of products'
(click)='onSelected(product)'>
```

Product Detail: Saw	
Name:	Saw
Code:	tbx-0022
Description:	15-inch steel blade hand saw
Availability:	May 15, 2017
Price:	\$11.55
Rating:	★★★★
	
<a href="#">Edit</a>	

## List Component

```
onSelected(product: IProduct) {
  this.productService.changeSelectedProduct(product);
}
```

## Service

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

```
changeSelectedProduct(selectedProduct: IProduct) {
  this.selectedProductSource.next(selectedProduct);
}
```

## Detail Component

```
this.productService.selectedProductChanges$.subscribe(
  selectedProduct => this.product = selectedProduct
)
```



# Demo



## Using a Subject for Explicit Change Notifications

Product  
Shell List

Product  
Service

```
this.mySubject.next(item);
```

Product  
Shell

Product  
Shell  
Detail





# Demo



## Implementing a Second Subscription

Product  
Shell List

Product  
Service

```
this.mySubject.next(item);
```

Product  
Shell

Product  
Shell  
Detail



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### Products

Garden Cart (GDN-0023)

Hammer (TBX-0048)

Leaf Rake (GDN-0011)

Saw (TBX-0022)

Video Game Controller (GMG-0042)

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

### Edit Product: Garden Cart

**Product Name**

Garden Cart

**Product Code**

GDN-0023

**Description**

15 gallon capacity rolling garden cart

Save

Cancel

Delete

## Service

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

Garden  
Cart

```
changeSelectedProduct(selectedProduct: IProduct) {  
    this.selectedProductSource.next(selectedProduct);  
}
```



# Subject vs. BehaviorSubject

**Subject**

**BehaviorSubject**

- Requires an initial value
- Provides the current value on a new subscription



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### Products

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### Edit Product: Garden Cart

**Product Name**

**Product Code**

**Description**

## Service

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

changeSelectedProduct(selectedProduct: IProduct) {
    this.selectedProductSource.next(selectedProduct);
}
```

Garden  
Cart



# Demo



## Using BehaviorSubject

Product  
Shell List

Product  
Service

Product  
Shell

Product  
Shell  
Detail

```
this.myBehaviorSubject.next(item);
```



# Demo



## Cleaning up a Subscription

Product  
Shell List

Product  
Service

Product  
Shell

Product  
Shell  
Detail

```
this.myBehaviorSubject.next(item);
```



# Guidelines & Summary: Communicating Through Service Notifications

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# Does the Service Need a Subject?

## Yes:

- Notifications are required
- Those notification are more than just changes to bound properties

## No:

- Notifications are not required
- The only notifications are for changes to bound properties





## Which Subject to Use?

### Subject

- Requires no initial value
- Broadcasts items as they are pushed

### BehaviorSubject

- Requires an initial value
- Provides the current value and then broadcasts items as they are pushed

<http://reactivex.io/documentation/subject.html>



# Summary

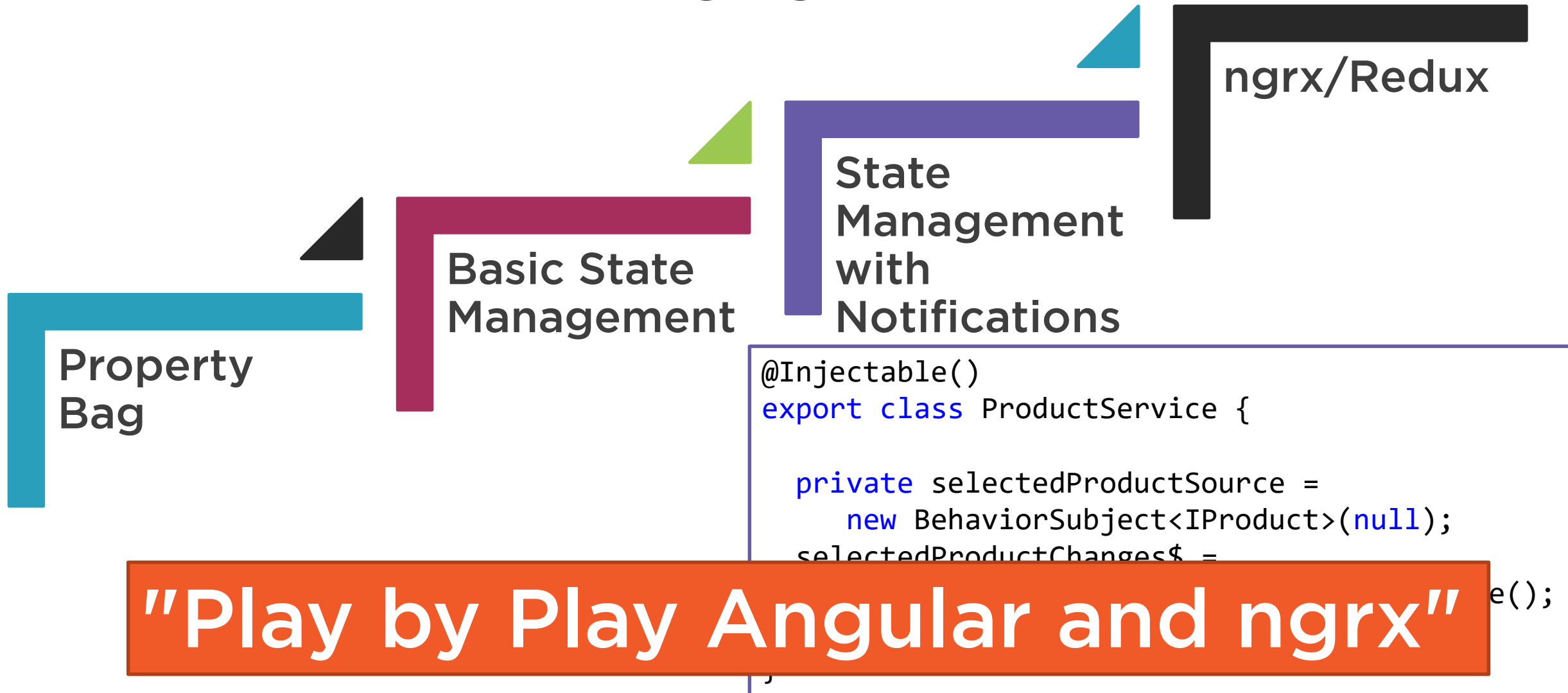


## Broadcasting Service Notifications

- EventEmitter
- Subject
- BehaviorSubject



# Managing State



**"Play by Play Angular and ngrx"**



# Component Communication

