

Sharing data between child and parent directives and components

A common pattern in Angular is sharing data between a parent component and one or more child components. Implement this pattern with the `@Input()` and `@Output()` decorators.

See the for a working example containing the code snippets in this guide.

Consider the following hierarchy:

```
<parent-component>
  <child-component></child-component>
</parent-component>
```

The `<parent-component>` serves as the context for the `<child-component>`.


`@Input()` and `@Output()` give a child component a way to communicate with its parent component.

`@Input()` lets a parent component update data in the child component. Conversely, `@Output()` lets the child send data to a parent component.

{@a input}

Sending data to a child component

The `@Input()` decorator in a child component or directive signifies that the property can receive its value from its parent component.

 Input data flow diagram of data flowing from parent to child

To use `@Input()`, you must configure the parent and child.

Configuring the child component

To use the `@Input()` decorator in a child component class, first import `Input` and then decorate the property with `@Input()`, as in the following example.

In this case, `@Input()` decorates the property `item`, which has a type of `string`, however, `@Input()` properties can have any type, such as `number`, `string`, `boolean`, or `object`. The value for `item` comes from the parent component.

Next, in the child component template, add the following:

Configuring the parent component


The next step is to bind the property in the parent component's template. In this example, the parent component template is `app.component.html`.

1. Use the child's selector, here `<app-item-detail>`, as a directive within the parent component template.
2. Use [property binding](#) to bind the `item` property in the child to the `currentItem` property of the parent.

3. In the parent component class, designate a value for `currentItem` :

With `@Input()` , Angular passes the value for `currentItem` to the child so that `item` renders as `Television` .

The following diagram shows this structure:

 Property binding diagram of the target, `item`, in square brackets set to the source, `currentItem`, on the right of an equal sign

The target in the square brackets, `[]` , is the property you decorate with `@Input()` in the child component. The binding source, the part to the right of the equal sign, is the data that the parent component passes to the nested component.

Watching for `@Input()` changes

To watch for changes on an `@Input()` property, use `OnChanges` , one of Angular's [lifecycle hooks](#). See the [OnChanges](#) section of the [Lifecycle Hooks](#) guide for more details and examples.

{@a output}

Sending data to a parent component

The `@Output()` decorator in a child component or directive lets data flow from the child to the parent.

 Output diagram of the data flow going from child to parent

`@Output()` marks a property in a child component as a doorway through which data can travel from the child to the parent.

The child component uses the `@Output()` property to raise an event to notify the parent of the change. To raise an event, an `@Output()` must have the type of `EventEmitter` , which is a class in `@angular/core` that you use to emit custom events.

The following example shows how to set up an `@Output()` in a child component that pushes data from an HTML `<input>` to an array in the parent component.

To use `@Output()` , you must configure the parent and child.

Configuring the child component

The following example features an `<input>` where a user can enter a value and click a `<button>` that raises an event. The `EventEmitter` then relays the data to the parent component.

1. Import `Output` and `EventEmitter` in the child component class:

```
import { Output, EventEmitter } from '@angular/core';
```

1. In the component class, decorate a property with `@Output()` . The following example `newItemEvent` `@Output()` has a type of `EventEmitter` , which means it's an event.

The different parts of the preceding declaration are as follows:

```
* `@Output()`&mdash;a decorator function marking the property as a way for data to go
from the child to the parent
* `newItemEvent`&mdash;the name of the `@Output()`
* `EventEmitter<string>`&mdash;the `@Output()`'s type
* `new EventEmitter<string>()`&mdash;tells Angular to create a new event emitter and
that the data it emits is of type string.
```

For more information on `EventEmitter` , see the [EventEmitter API documentation](#).

1. Create an `addNewItem()` method in the same component class:

The `addNewItem()` function uses the `@Output()` , `newItemEvent` , to raise an event with the value the user types into the `<input>` .

Configuring the child's template

The child's template has two controls. The first is an HTML `<input>` with a [template reference variable](#) , `#newItem` , where the user types in an item name. The `value` property of the `#newItem` variable stores what the user types into the `<input>` .

The second element is a `<button>` with a `click` [event binding](#).

The `(click)` event is bound to the `addNewItem()` method in the child component class. The `addNewItem()` method takes as its argument the value of the `#newItem.value` property.

Configuring the parent component

The `AppComponent` in this example features a list of `items` in an array and a method for adding more items to the array.

The `addItem()` method takes an argument in the form of a string and then adds that string to the `items` array.

Configuring the parent's template

1. In the parent's template, bind the parent's method to the child's event.
2. Put the child selector, here `<app-item-output>` , within the parent component's template, `app.component.html` .

The event binding, `(newItemEvent)='addItem($event)'` , connects the event in the child, `newItemEvent` , to the method in the parent, `addItem()` .

The `$event` contains the data that the user types into the `<input>` in the child template UI.

To see the `@Output()` working, add the following to the parent's template:

```
<ul>
  <li *ngFor="let item of items">{{item}}</li>
</ul>
```

The `*ngFor` iterates over the items in the `items` array. When you enter a value in the child's `<input>` and click the button, the child emits the event and the parent's `addItem()` method pushes the value to the `items` array and new item renders in the list.

Using `@Input()` and `@Output()` together

Use `@Input()` and `@Output()` on the same child component as follows:

The target, `item`, which is an `@Input()` property in the child component class, receives its value from the parent's property, `currentItem`. When you click delete, the child component raises an event, `deleteRequest`, which is the argument for the parent's `crossOffItem()` method.

The following diagram shows the different parts of the `@Input()` and `@Output()` on the `<app-input-output>` child component.



Diagram of an input target and an output target each bound to a source.

The child selector is `<app-input-output>` with `item` and `deleteRequest` being `@Input()` and `@Output()` properties in the child component class. The property `currentItem` and the method `crossOffItem()` are both in the parent component class.

To combine property and event bindings using the banana-in-a-box syntax, `[()]`, see [Two-way Binding](#).

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