Combine

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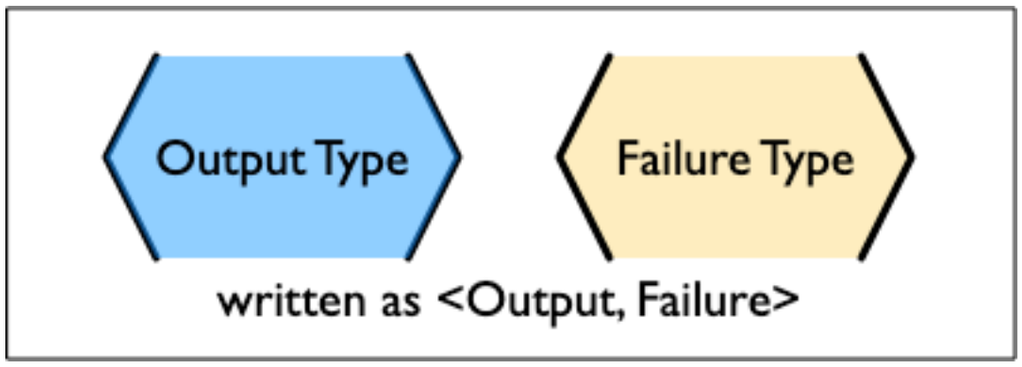
67-443: Mobile App Development

Publishers

- Provides data when available and upon request.
- A publisher that has not had any subscription requests will not provide any data.
- Describe publishers with two associated types: one for Output and one for Failure.



Subscribers

- Subscribers are responsible for requesting data and accepting the data (and possible failures) provided by a publisher.

- A subscriber is described with two associated types, one for Input and one for Failure.

- The subscriber initiates the request for data, and controls the amount of data it receives.

- It can be thought of as "driving the action" within Combine, as without a subscriber, the other components stay idle.

The Sink Subscriber

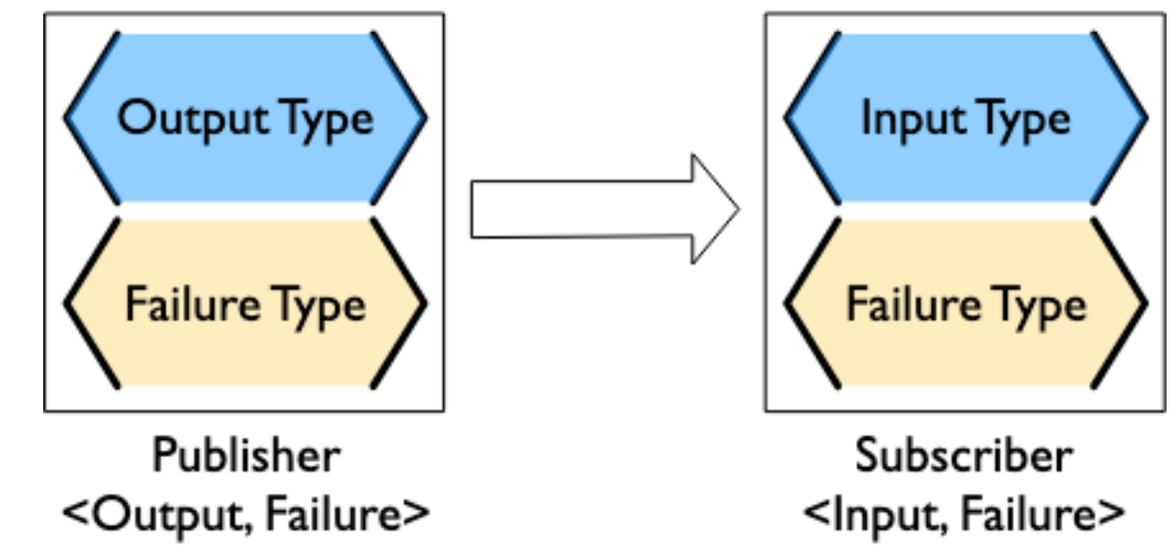
- Most common way to create a subscriber in Combine is with the `sink()` method.

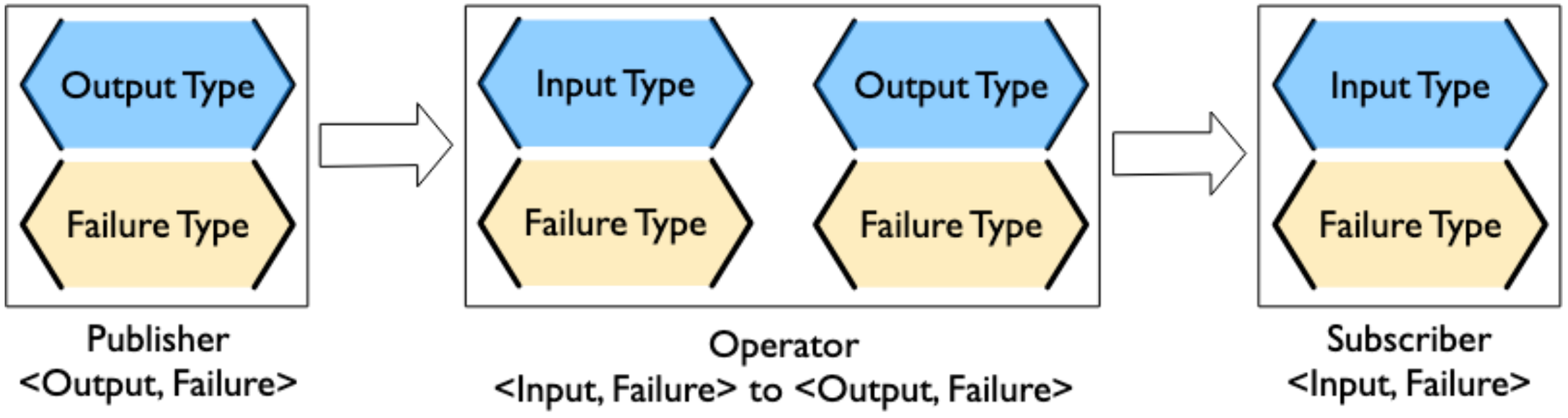
- If the error type is `Never` then the sink method will provide one simple closure to handle emitted values.

- In cases where the publisher can fail or complete, sink provides another closure called `receiveCompletion`. It allows you to process completion and failure events.

- Of course, you also have to handle the actual processing of values with another closure `receiveValue`.

Pipelines & Operators





Apple Foundation Publishers

- There is a generic Publisher protocol so you can create customized publishers

- Apple provides 3 popular Publishers in Foundation
  - `DataTaskPublisher`
  - `NotificationCenter.Publisher`
  - `Timer.Publisher`

DataTaskPublisher

- The `URLSession` class provides the convenient `dataTaskPublisher(for:)` method, which returns a DataTaskPublisher based on a URL. This is most useful for basic API calls.

- The dataTaskPublisher emits a tuple of `(data: Data, response: URLResponse)`, much like the existing closure-based handler. The error is handled by the publisher's failure event.

- In a typical API call that returns some JSON, we map to the received data, decode to a matching type and handle errors.

DataTaskPublisher

```
let url = URL(string: "https://
jsonplaceholder.typicode.com/posts/1")!

let cancellable = URLSession.shared
    .dataTaskPublisher(for: url)
    .retry(1)
    .map(\.data)
    .decode(type: Post.self, decoder: JSONDecoder())
    .replaceError(with: .empty)
    .sink { it in
        print(it)
    }
```