Control your dependencies

don't let them control you

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What is a dependency?

What is a dependency?

> The types and functions in your application that need to interact with outside systems that you do not control.

Examples of dependencies

Network API clients

```
let users = try await apiClient.fetchUsers()
```

Examples of dependencies

Location managers

```
let manager = CLLocationManager()

await manager.requestWhenInUseAuthorization()

let location = try await manager.requestLocation()
```

Examples of dependencies

File systems

```
var data = try Date(contentsOf: URL(…))

data.append(…)

try data.write(to: URL(…))
```

Examples of dependencies

Firebase

```
import FirebaseDatabase

let ref = Database.database().reference()
self.ref
    .child("users")
    .child(user.uid)
    .setValue(["username": username])
```

Examples of dependencies

Clocks and schedulers

```
try await Task.sleep(for: .seconds(1))

DispatchQueue.main.schedule(after: .now + 1)
{
  …
}
```

Examples of dependencies

`Date()` and `UUID()`

```swift
let user = User(
  id: UUID(),
  name: "Blob",
  createdAt: Date()
)
```

Examples of dependencies

...and a *lot* more

The problem with uncontrolled dependencies

The problem with dependencies

Many are slow to compile

```
import Firebase
```

> *Build succeeded 86.9 seconds*

The problem with dependencies

Some make it annoying to run your code

The problem with dependencies

Some do not work in Xcode previews

The problem with dependencies

Some *break* Xcode previews

The problem with dependencies

Accidental interaction with "live" dependencies

The problem with dependencies

Difficult or impossible to unit test and UI test

Death by 1,000 paper cuts

What can we do about it?

In short:

Don't reach out to code you don't own and can't control

Controlling dependencies

Time

```
let clock: any Clock<Duration>
try await clock.sleep(for: .seconds(1))
```

Controlling dependencies

Analytics

```
let analytics: any Analytics = LiveAnalytics()

analytics.track("Authorization granted")
```

Controlling dependencies

Apple Frameworks

Dependencies controlled

Safety & Ergonomics

Safety

```
init(
  analytics: any Analytics = LiveAnalytics(),
  location: any LocationClient = LiveLocationClient()
) {
  // ...
}
```

Ergonomics

```
init(
  analytics: any Analytics,
  locationClient: any LocationClient
) {
  // ...
}
```

*Defaults are **ergonomic**, but not **safe**. Requirements are **safe**, but not **ergonomic**.*

“Dependency injection” library

- Cleanse
- Factory
- Needle
- Swinject
- Weaver
- ...

github.com/pointfreeco/
swift-dependencies

This is just the beginning

Advanced topics

- Designing dependencies
- Overriding dependencies
- Testing

github.com/pointfreeco/
swift-dependencies

Thank you

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