LIVE! 360
TECH EVENTS WITH PERSPECTIVE

The Ultimate Education Destination
ORLANDO 2023

DI Why?
Getting a Grip on Dependency Injection

Jeremy Clark
Developer Betterer
jeremybytes.com

Level: Introductory / Intermediate

Visual Studio LIVE! EXPERT SOLUTIONS FOR ENTERPRISE DEVELOPERS · SQL Server LIVE! TRAINING FOR DBAs AND IT PROS · TECHMENTOR IN-DEPTH TRAINING FOR IT PROS · Artificial Intelligence LIVE! · Cloud & Containers LIVE! · Cybersecurity & Ransomware LIVE!

Session Survey

- Your feedback is very important to us
- Please take a moment to complete the session survey found in the mobile app
- Use the QR code or search for “Converge360 Events” in your app store
- Find this session on the Agenda tab
- Click “Session Evaluation”
- Thank you!

LIVE! 360
TECH EVENTS WITH PERSPECTIVE

DI Why?

Getting a Grip on Dependency Injection

Jeremy Clark
Developer Betterer
jeremybytes.com

Level: Introductory / Intermediate

Typical Introduction

```
private void BuildMainWindow()
{
    var builder = new ContainerBuilder();

    builder.RegisterType<SQLReader>().As<IPersonReader>()
        .SingleInstance();

    builder.RegisterSource(
        new AnyConcreteTypeNotAlreadyRegisteredSource());

    IContainer Container = builder.Build();

    Application.Current.MainWindow =
        Container.Resolve<PeopleViewerWindow>();
}
```

What Is Dependency Injection?

- Dependency Injection is a software design pattern that allows a choice of component to be made at run-time rather than compile time.
    - Wikipedia 2012

What Is Dependency Injection?

- Dependency injection is a software design pattern that allows the removal of hard-coded dependencies and makes it possible to change them, whether at run-time or compile-time.
  - Wikipedia 2013

What Is Dependency Injection?

- Dependency injection is a software design pattern that implements inversion of control and allows a program design to follow the dependency inversion principle. The term was coined by Martin Fowler.
  - Wikipedia 2014

What Is Dependency Injection?

- In software engineering, dependency injection is a software design pattern that implements inversion of control for software libraries, where the caller delegates to an external framework the control flow of discovering and importing a service or software module. Dependency injection allows a program design to follow the dependency inversion principle where modules are loosely coupled. With dependency injection, the client part of a program which uses a module or service doesn't need to know all its details, and typically the module can be replaced by another one of similar characteristics without altering the client.

  - Wikipedia 2015

What Is Dependency Injection?

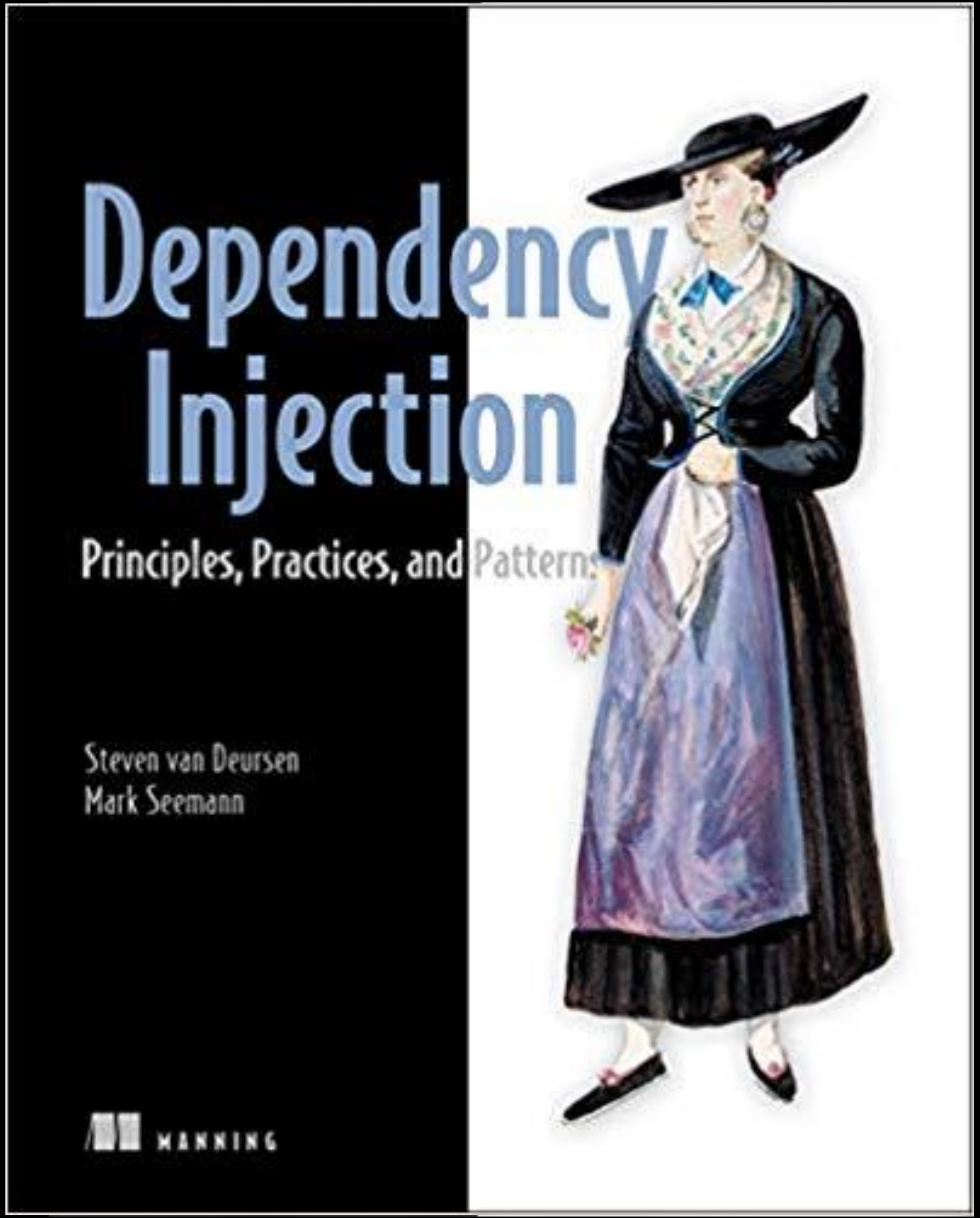
- In software engineering, dependency injection is a software design pattern that implements inversion of control for resolving dependencies. A dependency is an object that can be used (a service). An injection is the passing of a dependency to a dependent object (a client) that would use it. The service is made part of the client's state.[1] Passing the service to the client, rather than allowing a client to build or find the service, is the fundamental requirement of the pattern.
  - Wikipedia 2016

What Is Dependency Injection?

- Dependency Injection is a set of software design principles and patterns that enable us to develop loosely coupled code.
    - Mark Seemann

Dependency Injection
Principles, Practices, and Patterns

- Mark Seemann
- Steven van Deursen



Primary Benefits

- Extensibility
- Parallel Development
- Maintainability
- Testability
- Late Binding

- Adherence to S.O.L.I.D. Design Principles.

Benefits – Extensibility

Code can be extended in ways not explicitly planned for.

Benefits – Parallel Development

Code can be developed in parallel with less chance of merge conflicts.

Benefits – Maintainability

Classes with clearly defined responsibilities are easier to maintain.

Benefits – Testability

Classes can be unit tested,
i.e., easily isolated from other classes
and components for testing.

Benefits – Late Binding

Services can be swapped with other services without recompiling code.

Benefits – SOLID Principles

- Single Responsibility Principle (SRP)
- Open/Closed Principle (OCP)
- Liskov Substitution Principle (LSP)
- Interface Segregation Principle (ISP)
- Dependency Inversion Principle (DIP)

Dependency Injection Concepts

- DI Design Patterns
  - Constructor Injection
  - Property Injection
  - Method Injection
  - Ambient Context
  - Service Locator
- Dimensions of DI
  - Object Composition
  - Interception
  - Lifetime Management

Dependency Injection Containers

- C# Containers
  - Autofac
  - Ninject

- Frameworks w/ Containers
  - ASP.NET Core
  - Angular
  - Prism

  and many others

Application Layers

View

- PeopleViewerWindow

View Model

- PeopleViewModel

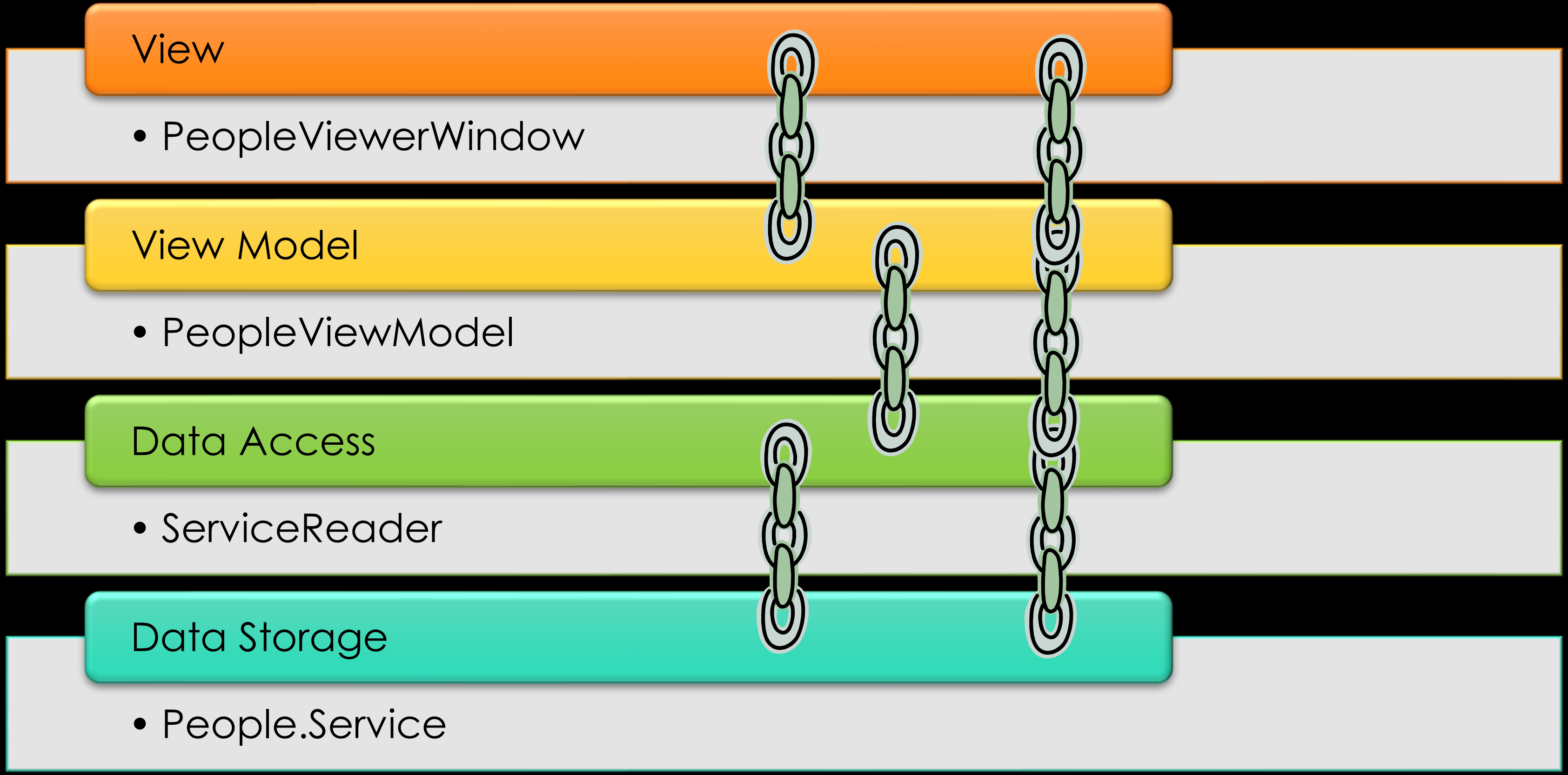
Data Access

- ServiceReader

Data Storage

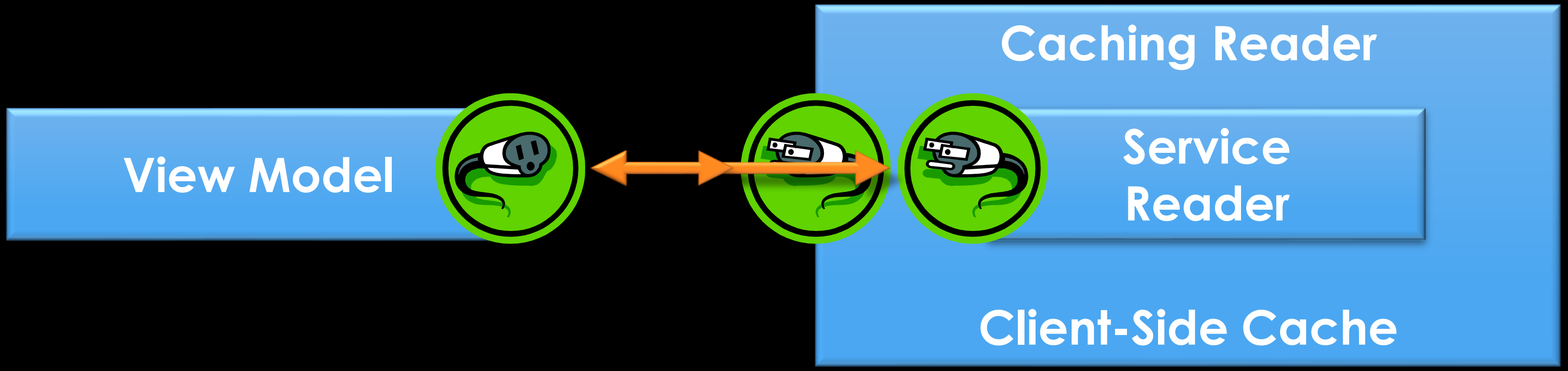
- People.Service

Tight Coupling

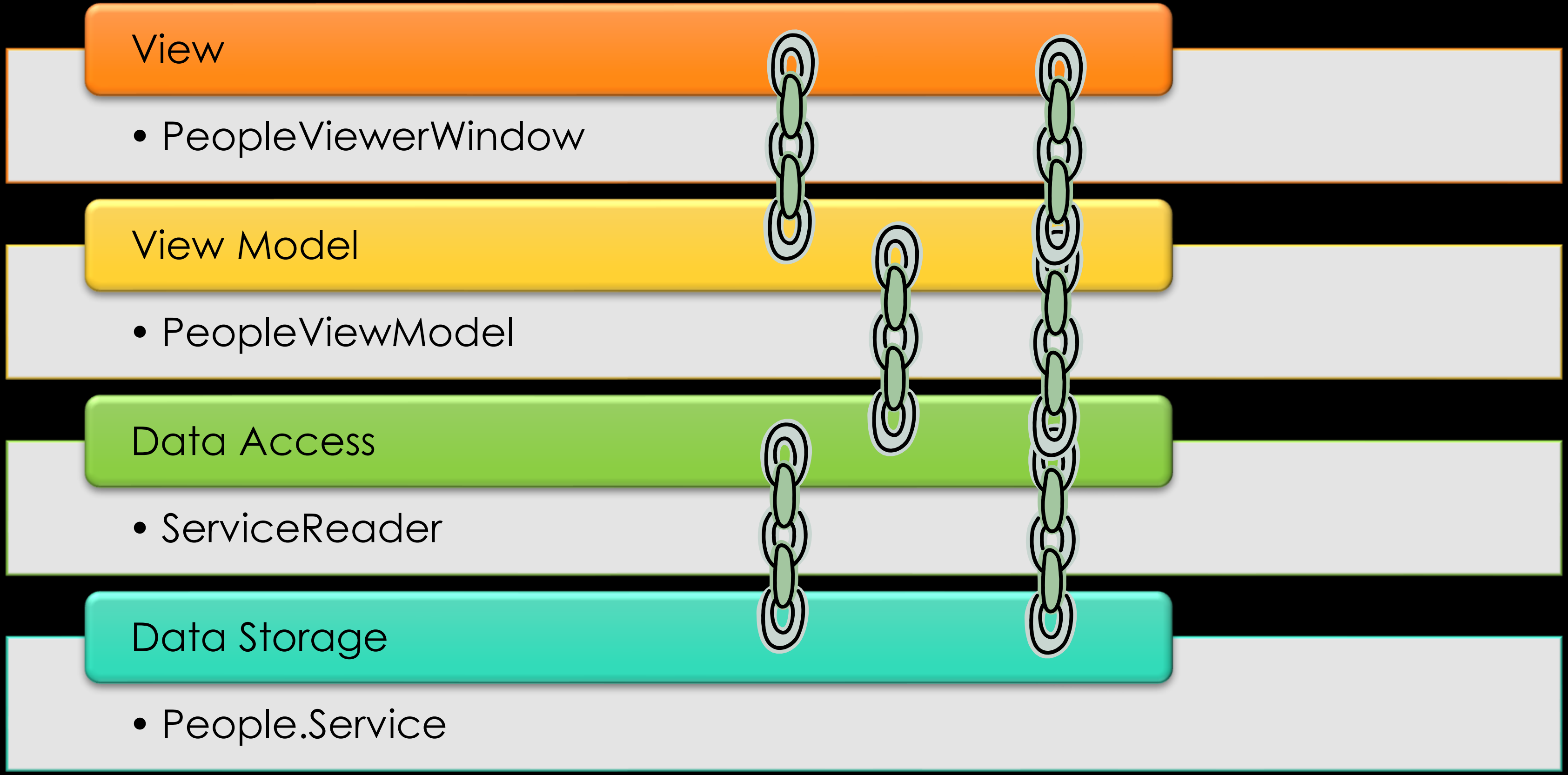


Creating a Caching Reader

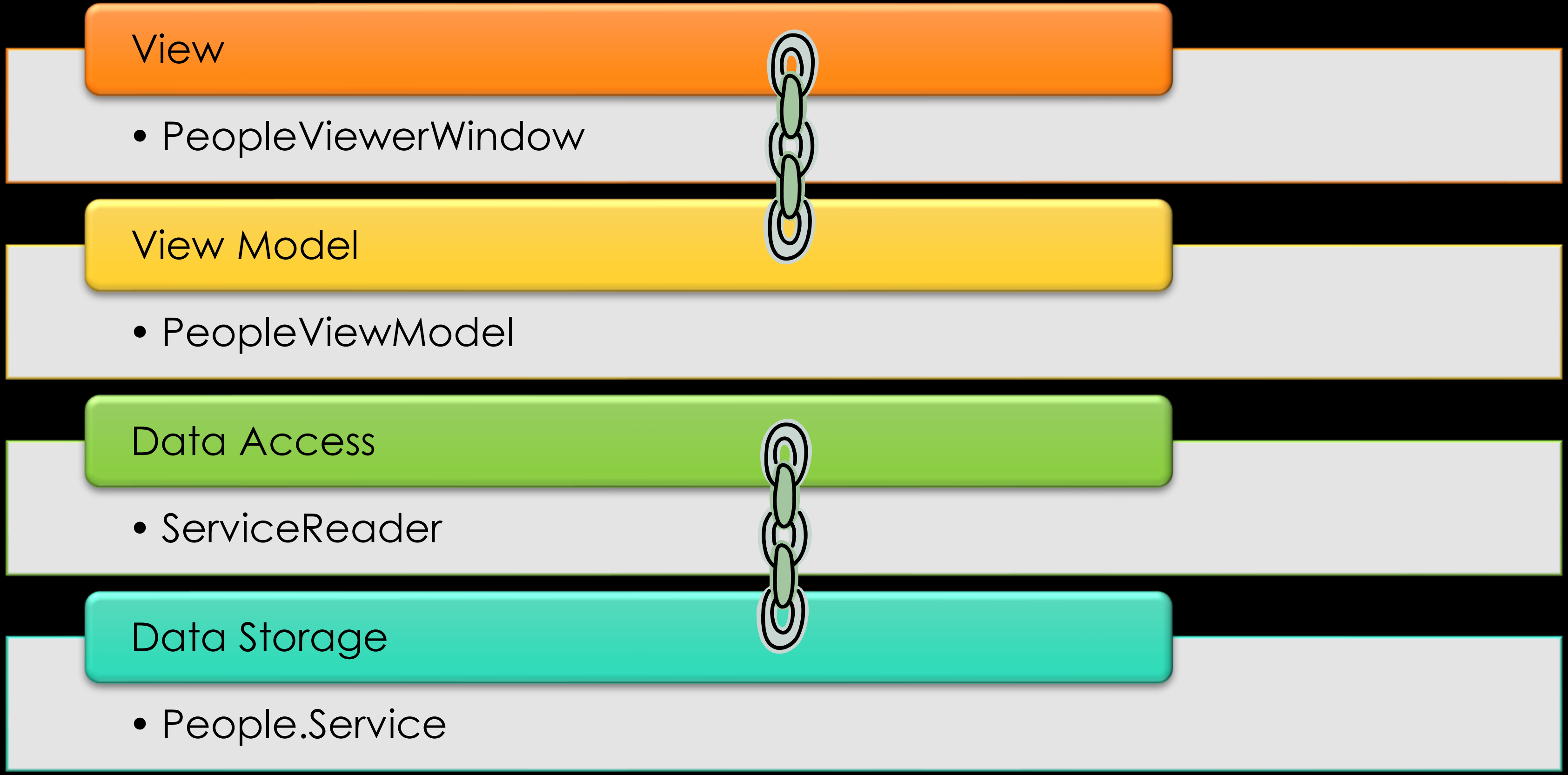
The Decorator Pattern



Loose(r) Coupling



Loose(r) Coupling



Primary Benefits

- Extensibility
- Parallel Development
- Maintainability
- Testability
- Late Binding

- Adherence to S.O.L.I.D. Design Principles.

Dependency Injection Concepts

- DI Design Patterns
  - Constructor Injection
  - Property Injection
  - Method Injection
  - Ambient Context
  - Service Locator

- Dimensions of DI
  - Object Composition
  - Interception
  - Lifetime Management

Session Survey

- Your feedback is very important to us
- Please take a moment to complete the session survey found in the mobile app
- Use the QR code or search for “Converge360 Events” in your app store
- Find this session on the Agenda tab
- Click “Session Evaluation”
- Thank you!

LIVE! 360

TECH EVENTS WITH PERSPECTIVE

Thank You!

Jeremy Clark

- www.jeremybytes.com
- github.com/jeremybytes
- youtube.com/jeremybytes
- @jeremybytes

https://github.com/jeremybytes/vslive2023-orlando