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CodeDesign

Drive predictability through Software Design

Monolith or Microservices?
Designing Deploy-Time Flexibility for Modular Systems

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Technical Trainer

Founder of Code Design

enjoing playing GO

enjoing traveling

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From Monolith to Micro-services

the MONOLITH

Not good at

Scalability	Maintainability	
Reliability	Testability	Security
Availability	Modernization	High Coupling
Resilience	Extensibility	

REDUNDANCY DECOMPOSITION

From Micro-services back to a Monolith

Not good because

Complex Communication

Performance

Complex Debugging & Diagnostics

Expensive Infrastructure

Maintainability

Testability

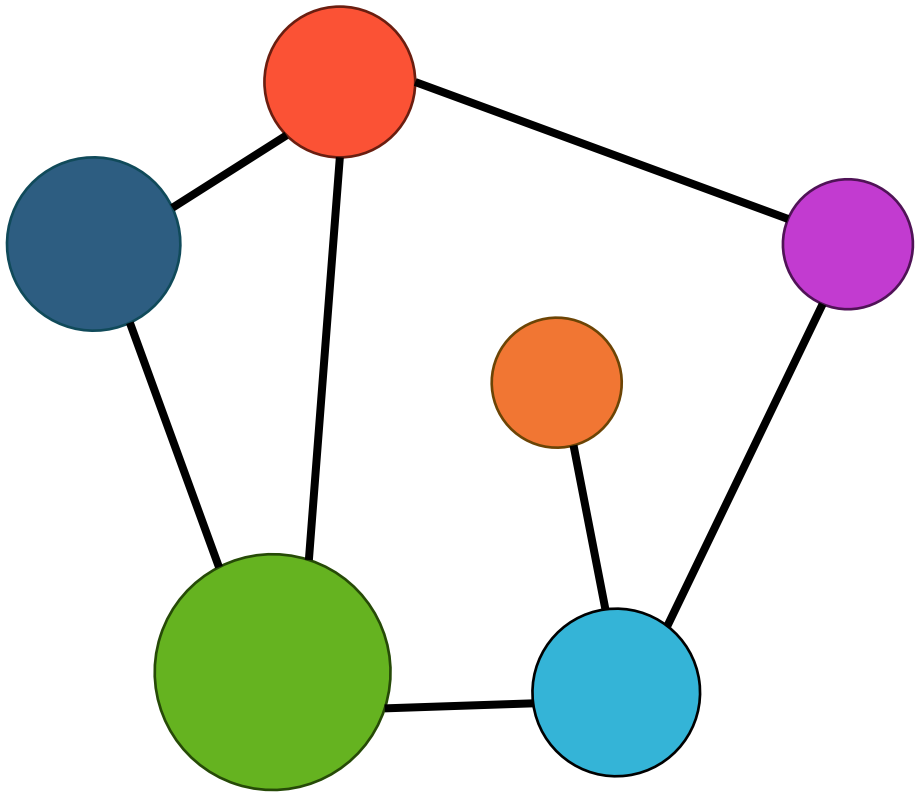
UNNECESARY COMPLEXITY

DECOMPOSITION

Micro-services

History Repeats Itself

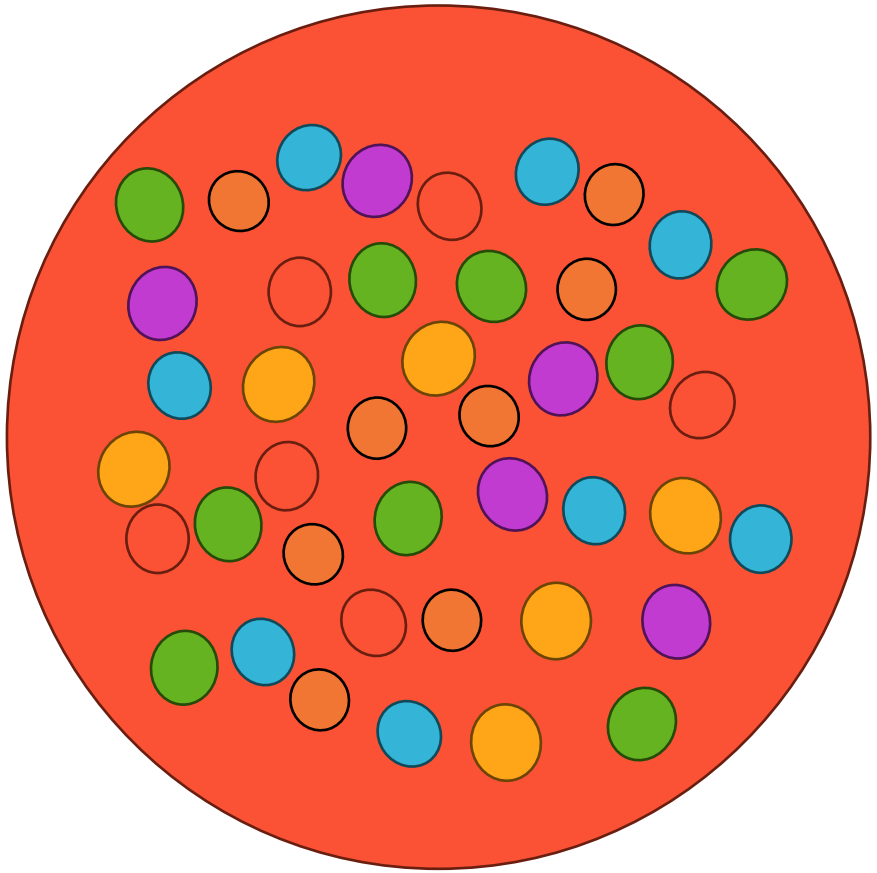
Modular System - Concept

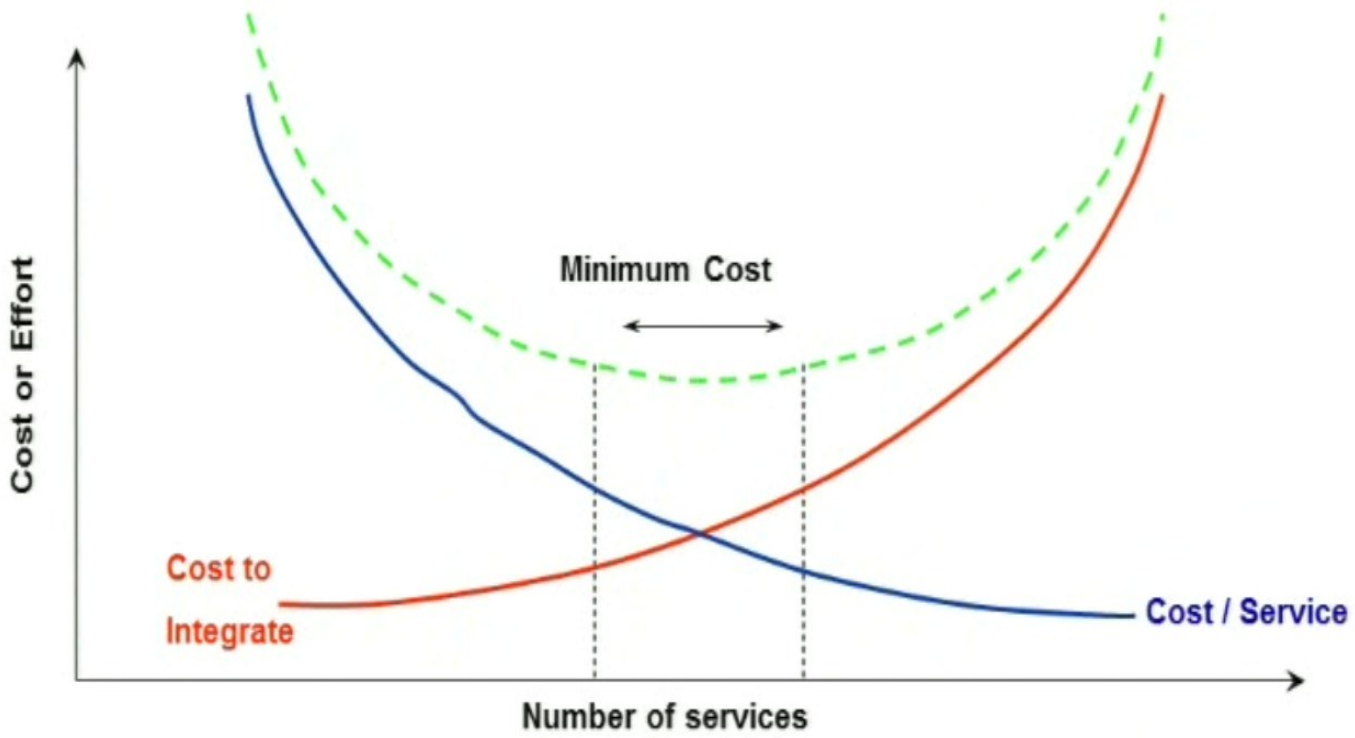


- Maintainability
- Extensibility
- Reusability

Separate the Communication Concern

How many services?





from *Righting Software* by Juval Lowy

Contracts – Are Key in Modular Systems

Services communicate through Explicit Contracts

- Abstract the functions it provides
- Encapsulate (hide) the implementation details

Contracts described with language constructs:

- Operation Contracts – functions the interfaces
- Data Contracts – DTOs (the in/out params)
- Fault Contracts – Exceptions

Synchronous Communication – function calls

Asynchronous Communication – message based

Target: Design for Deploy-Time Flexibility

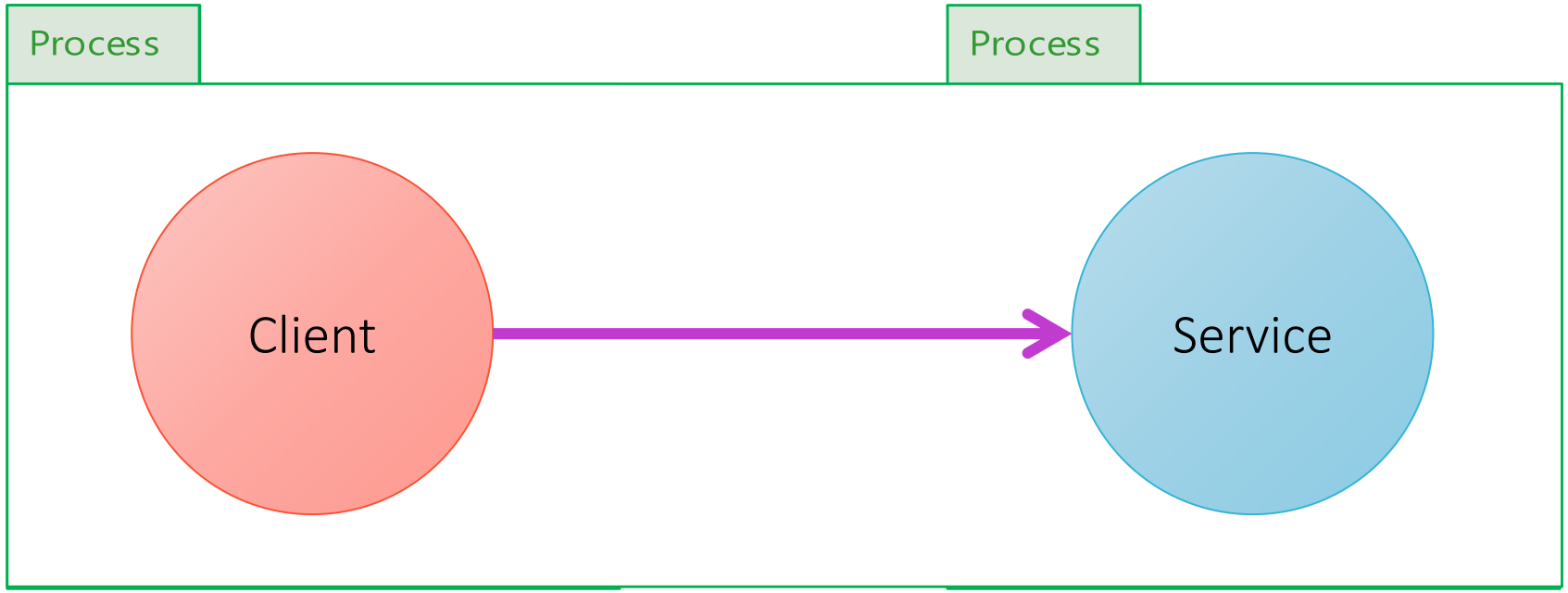
Decide ONLY at Deploy-Time if

deploy as a Monolith or

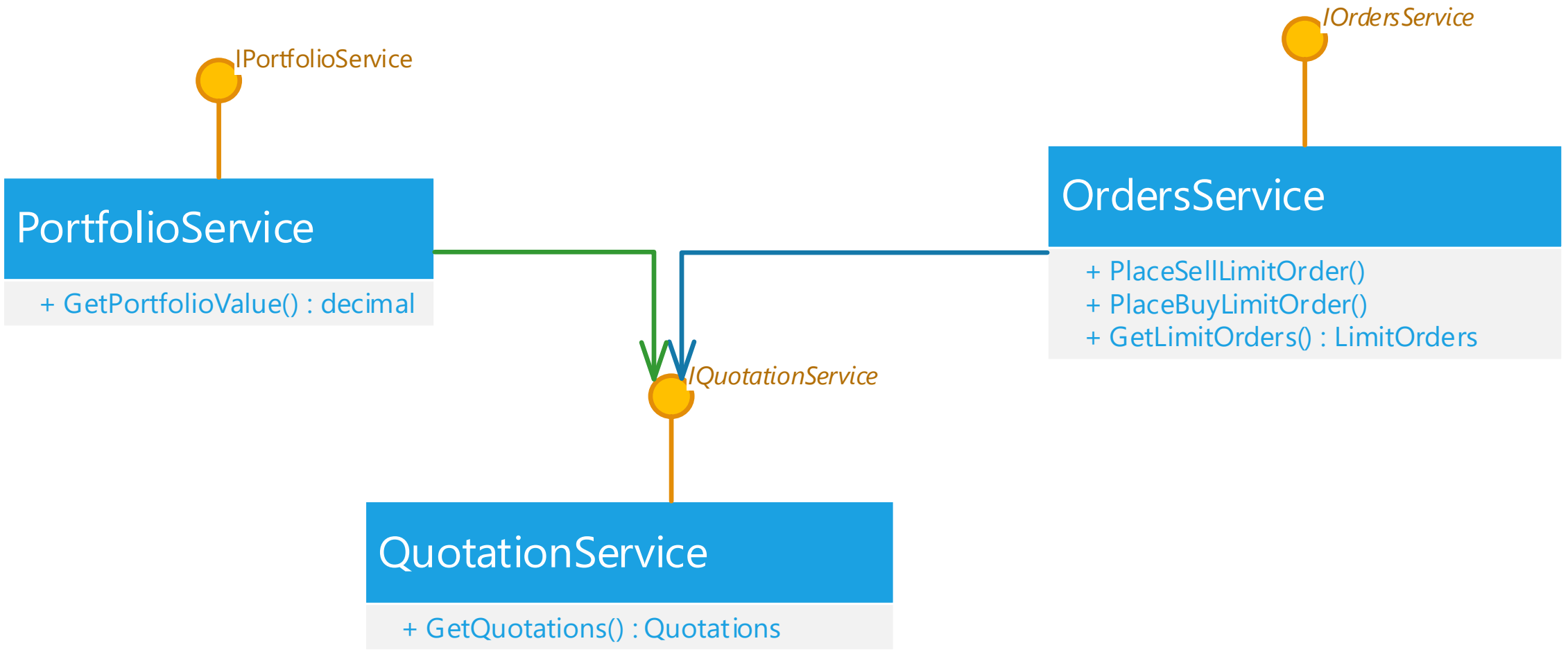
deploy as a Distributed System

without changing the code
without recompile the code

DEMO: In-Process / Inter-Process Communication

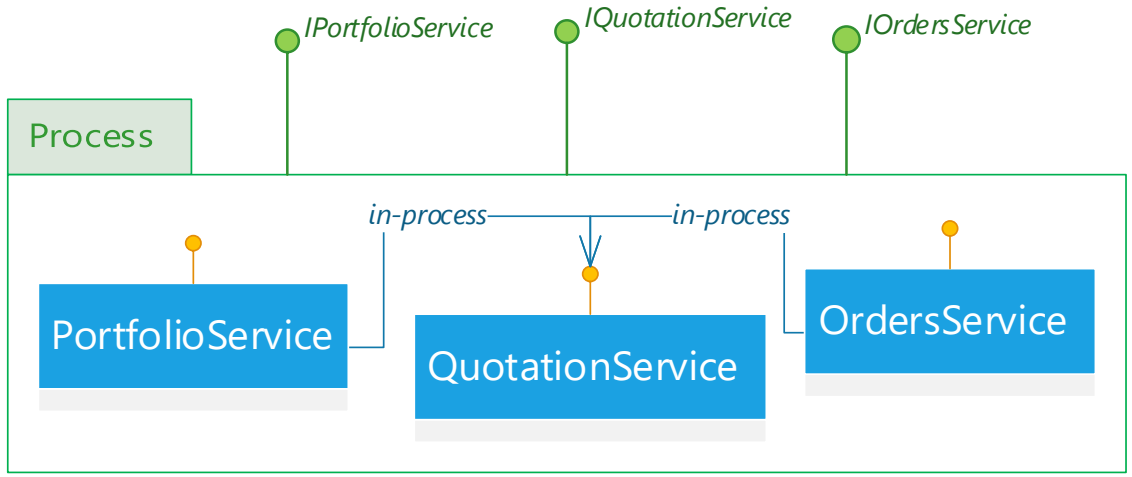


DEMO: Simplified Example of Dependent Services

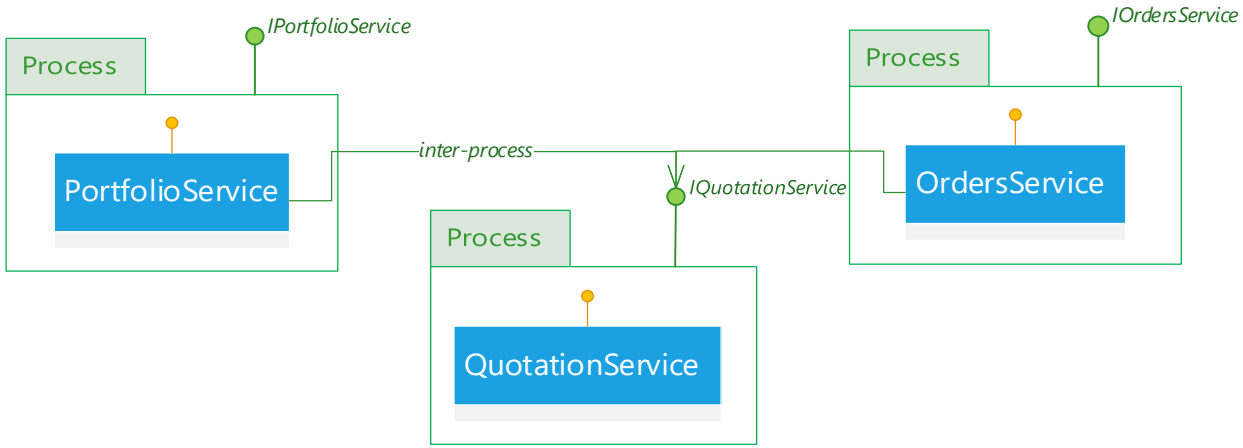


Decide at Deployment between Monolith or Micro-services

Monolith

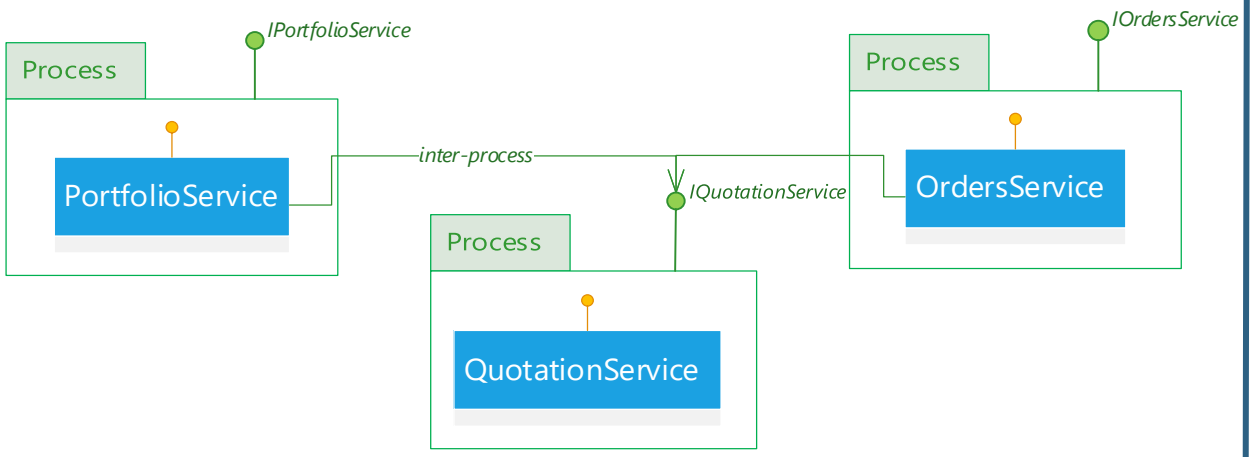


Micro-services

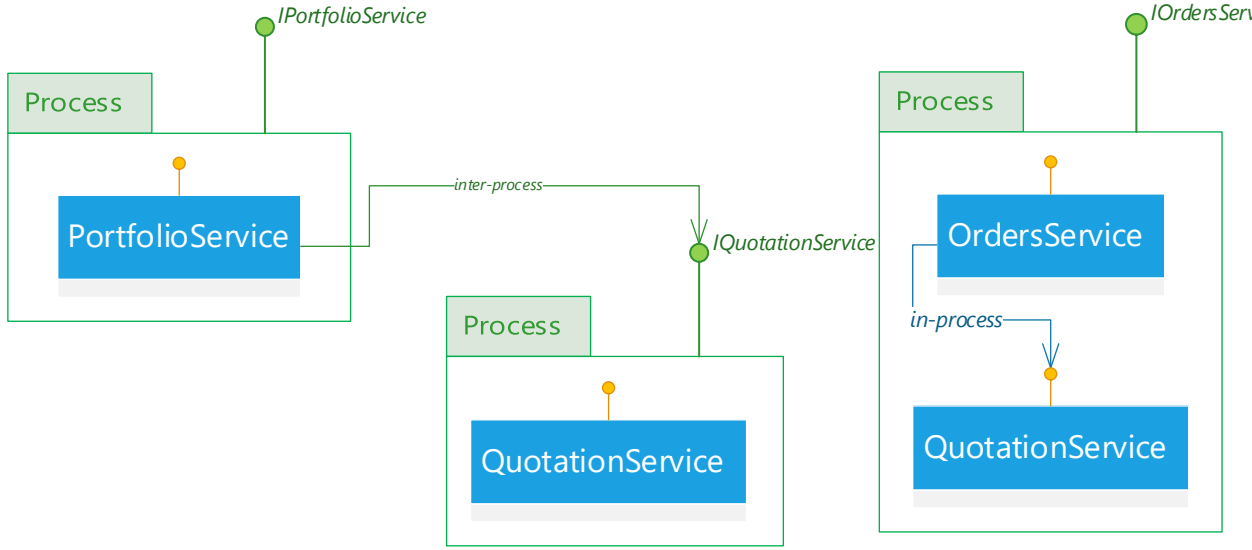


Decide at Deployment between Monolith or Micro-services

Micro-services



Micro-services

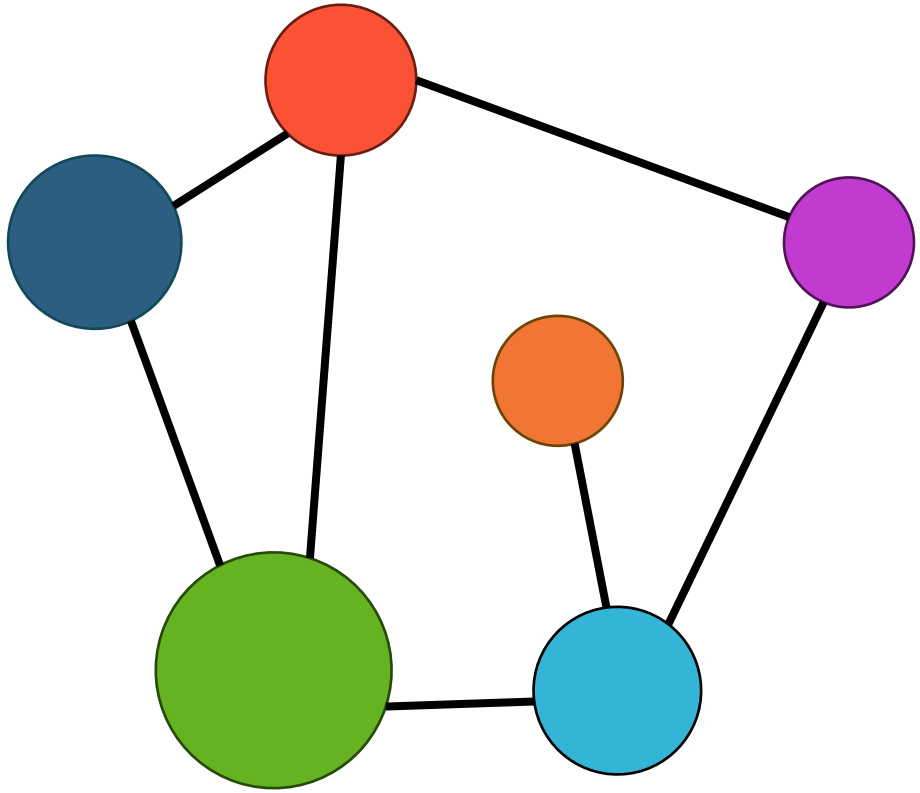


Solution for Design for Deploy-Time Flexibility

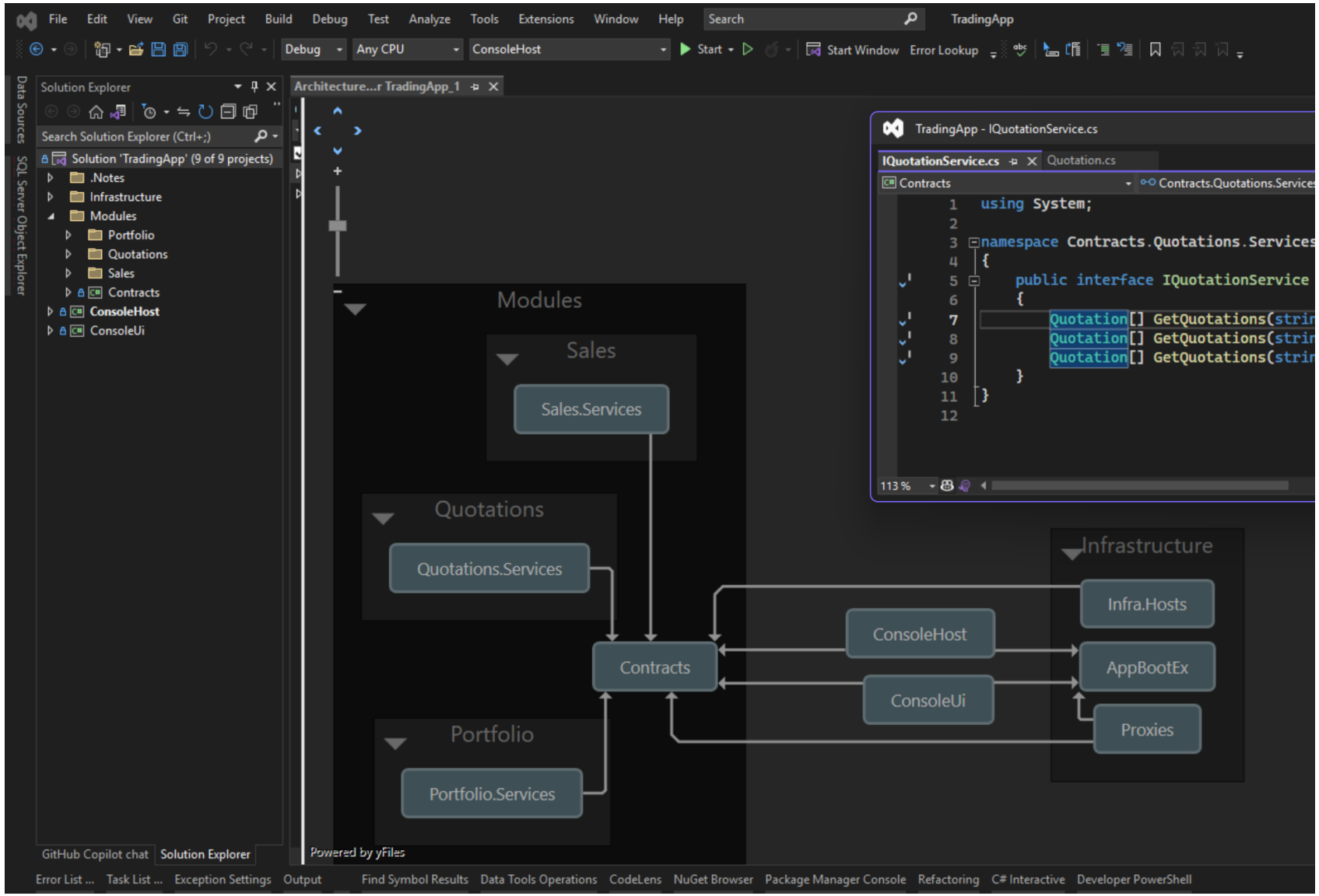
The solution stands on Three Pillars

1. **Depend only on CONTRACTS**
   written with abstract types
2. Use **Proxies** to forward the calls to the actual implementation
3. Generic Hosts with **Type Discovery**

Modular System



Coding Demo



Github Repo:

[Code-Design-Training / InterProcessCommunication / TradingApp]

Demo build up blog posts:

[oncodedesign.com/tag/communication]

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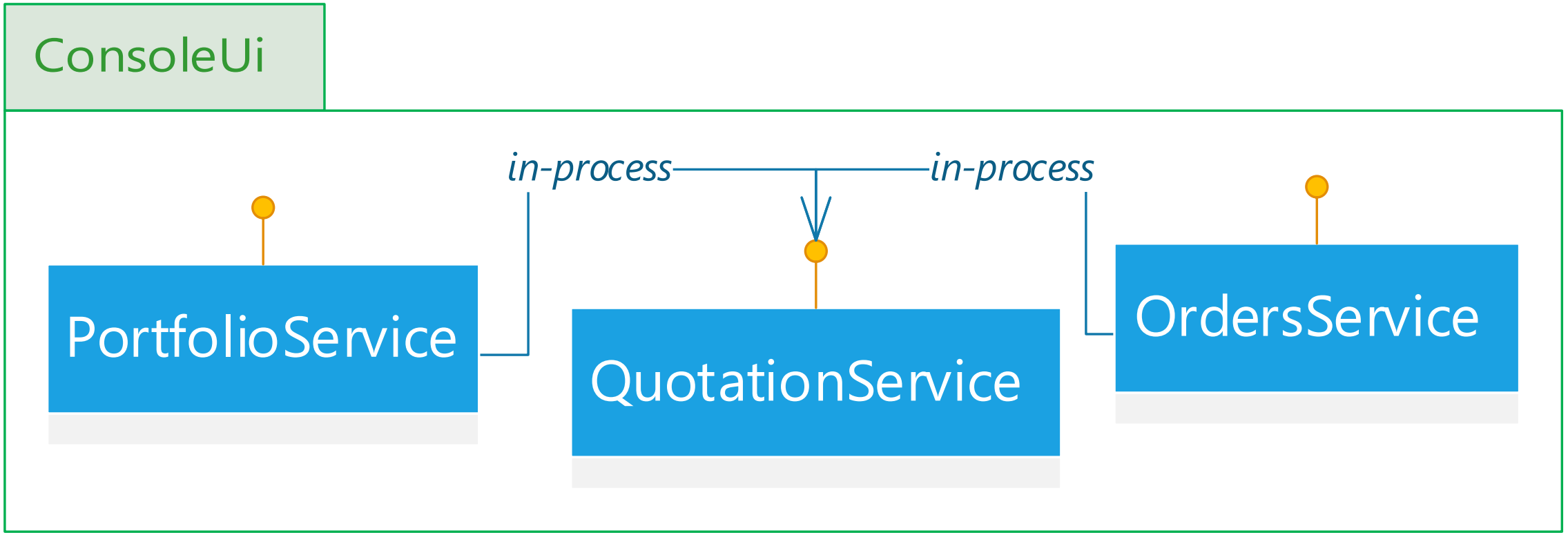
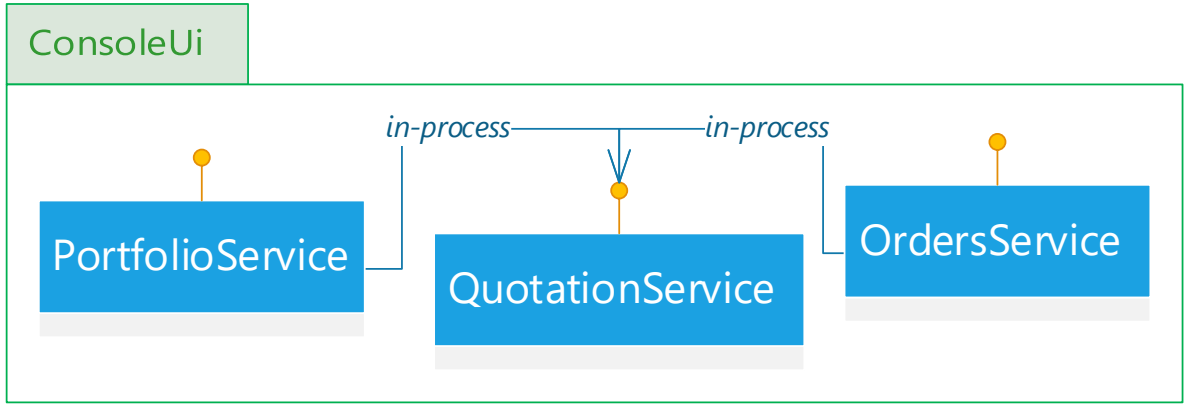
Demo Stage: Build up from Fat Client – ConsoleUI

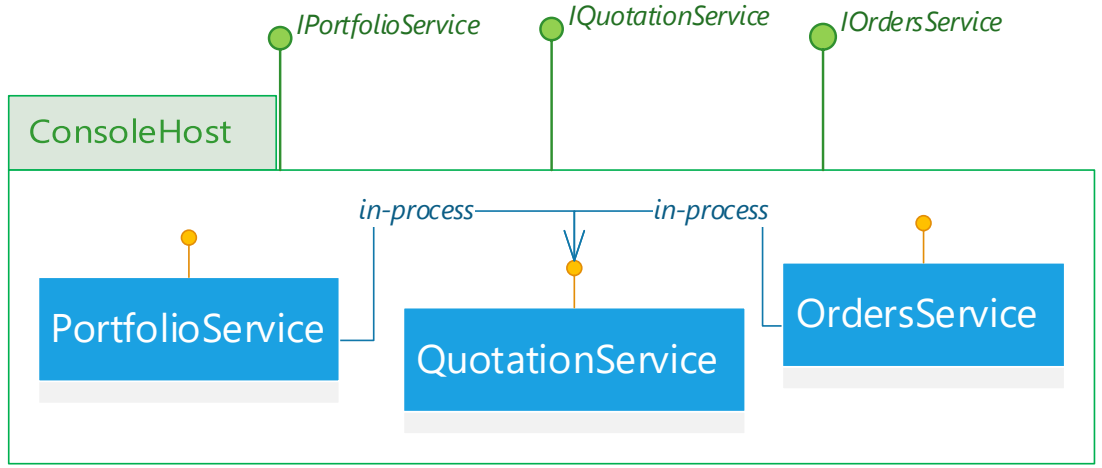


tag: ipc-step06a

Demo Stage: Modular Monolith Deployment

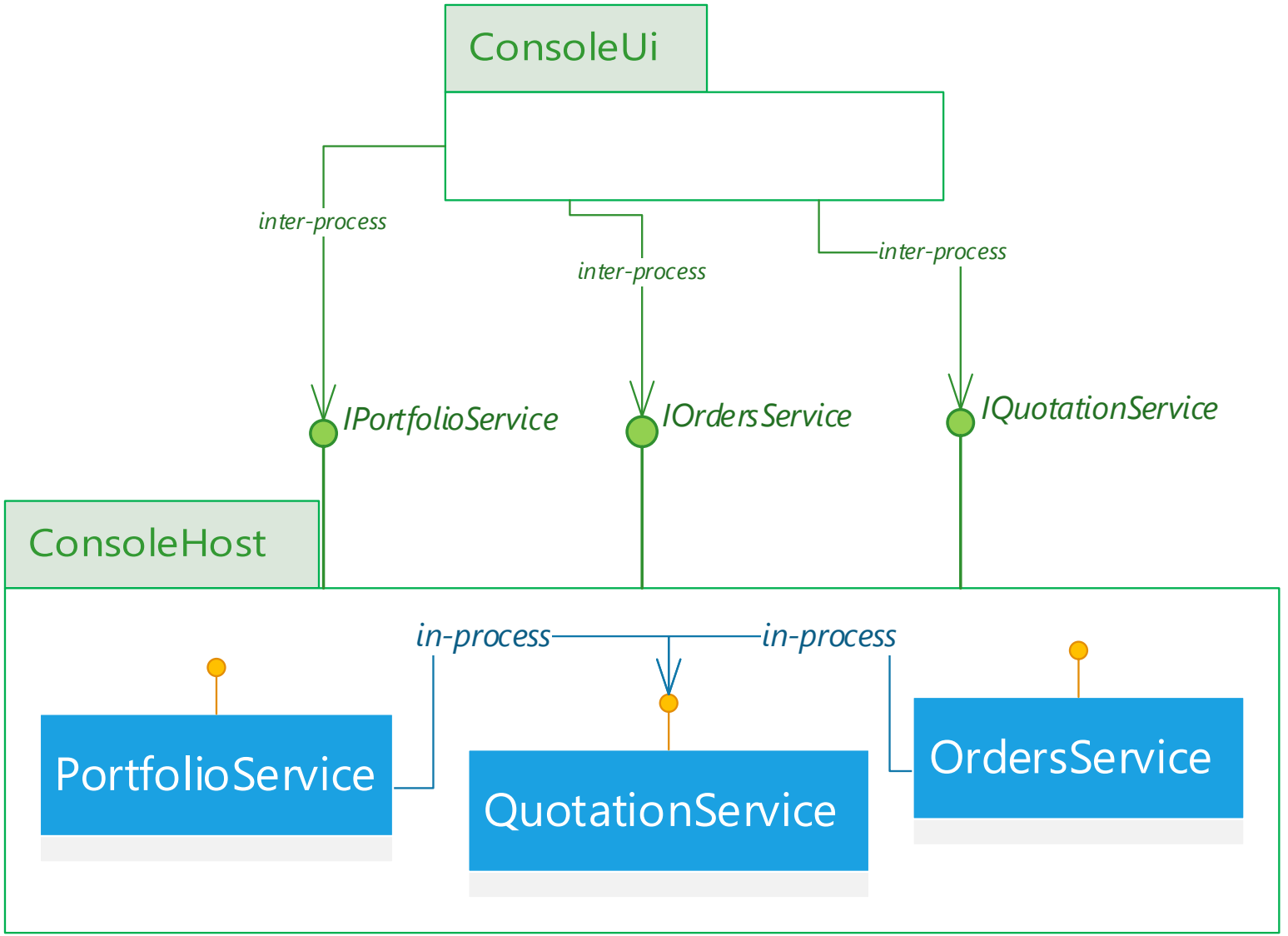
Disconnected Fat Client and Fat Backed





tag: ipc-step07b

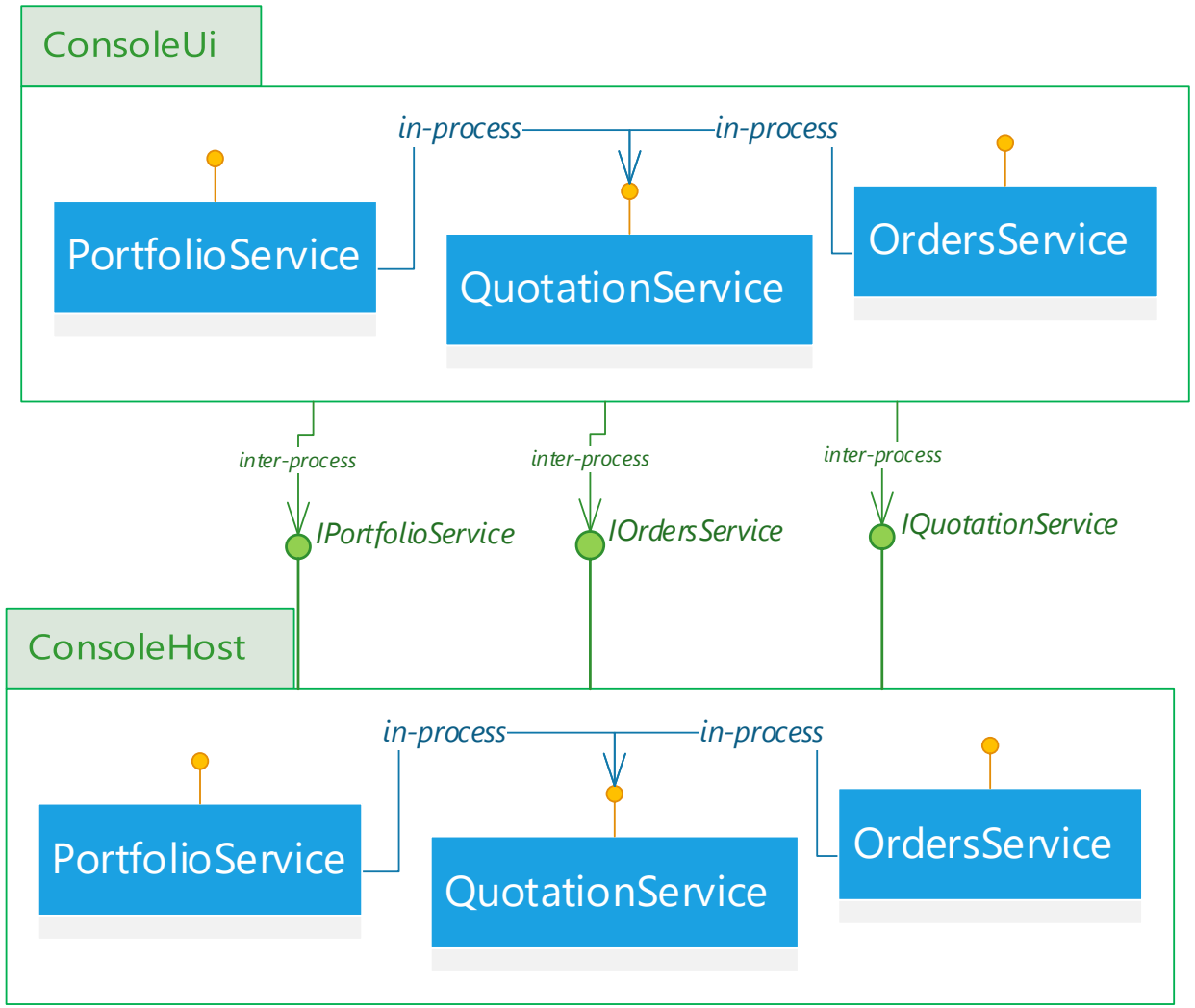
Demo Stage: Backend Monolith Deployment



tag: ipc-step08b

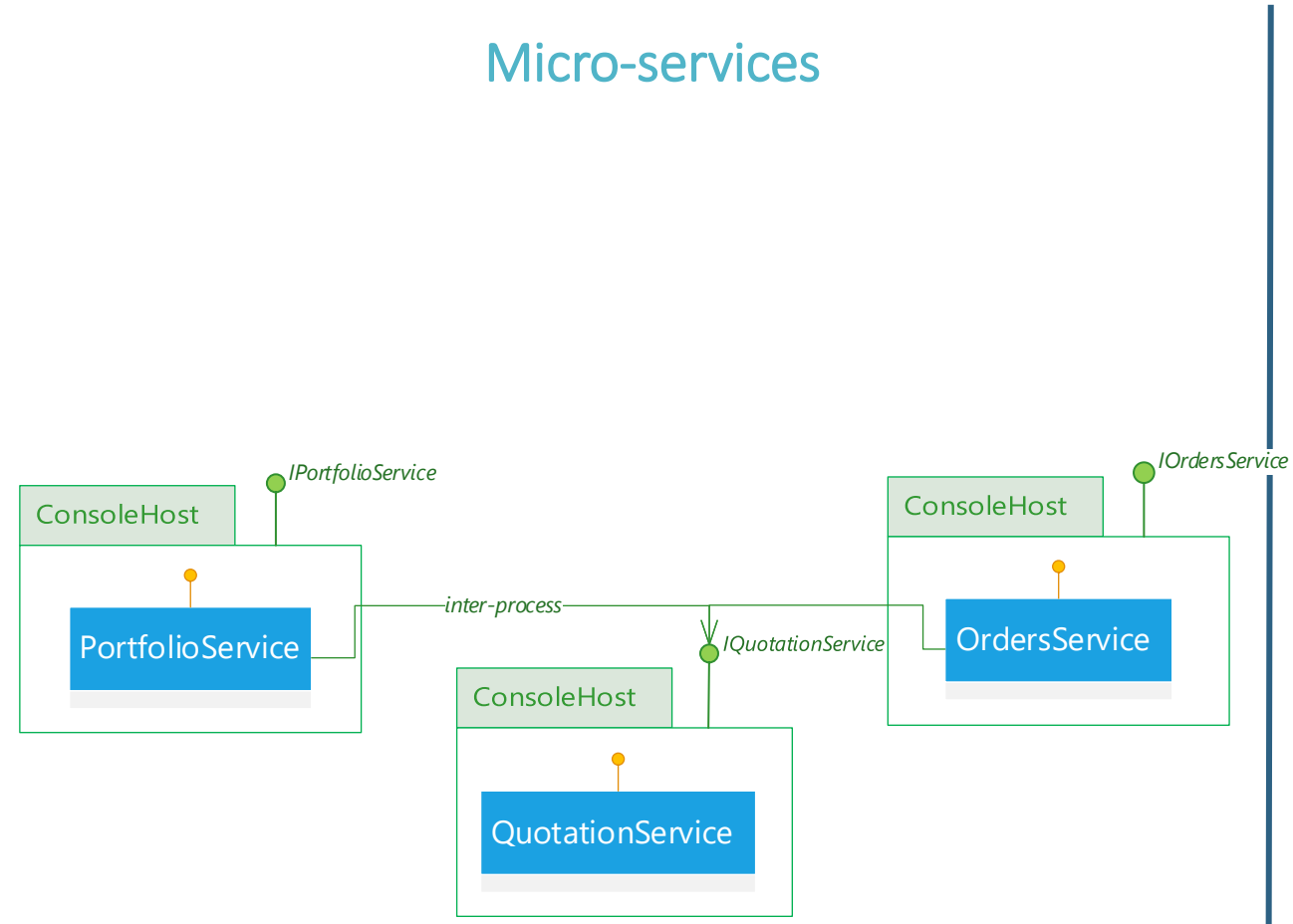
Demo Stage: Modular Monolith Deployment

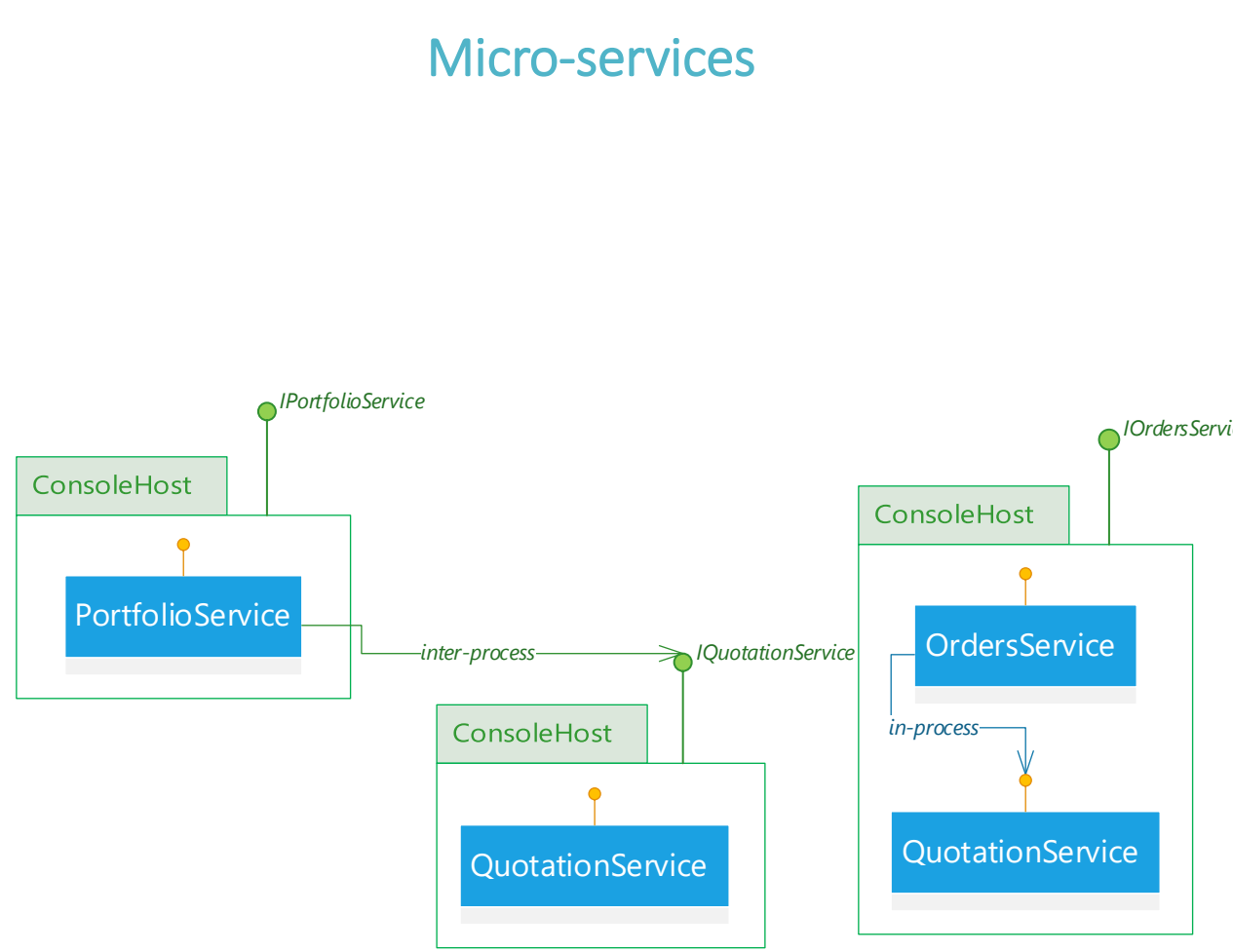
Connected Fat Client and Fat Backed



tag: ipc-step08b

Demo Stage: Flexible Deployment





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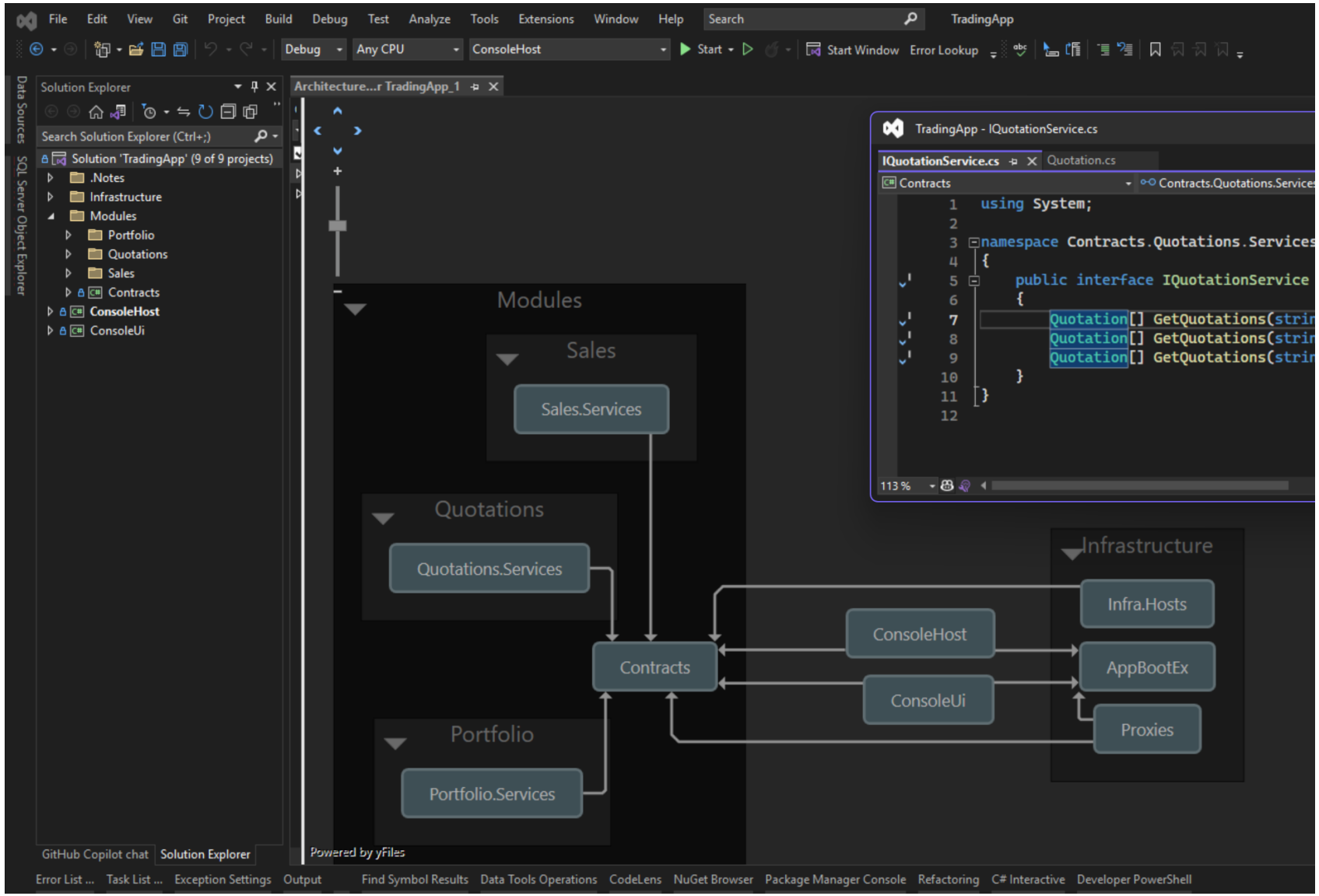
Coding Demo



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