Aspect-Oriented Programming with Dependency Injection

Mark Seemann
@ploeh
Cross-Cutting Concerns
Objective

- Single Responsibility Principle
- Open/Closed Principle
- Liskov Substitution Principle
- Interface Segregation Principle
- Dependency Inversion Principle

• Don’t Repeat Yourself

SOLID

DRY
Staying SOLID

- Single Responsibility Principle
- Open/Closed Principle
- Liskov Substitution Principle
- Interface Segregation Principle
- Dependency Inversion Principle

DRY

- Don’t Repeat Yourself
Prerequisite

Program to an interface, not an implementation

- Design Patterns, 1995
Conjecture

• It’s always possible to apply a Decorator to an interface
Using Decorators to add aspects

Client

IFoo

ConcreteFoo
Using Decorators to add aspects

Client

AuditingFoo

ConcreteFoo
Using Decorators to add aspects

Client

IFoo

SecureFoo

AuditingFoo

ConcreteFoo
Staying SOLID with Decorators

DEMO
Staying SOLID

- Single Responsibility Principle
- Open/Closed Principle
- Liskov Substitution Principle
- Interface Segregation Principle
- Dependency Inversion Principle

DRY

- Don’t Repeat Yourself
Staying DRY

SOLID

• Single Responsibility Principle
• Open/Closed Principle
• Liskov Substitution Principle
• Interface Segregation Principle
• Dependency Inversion Principle

DRY

• Don’t Repeat Yourself
Dynamic interception

From here on, dynamic interception is required

Commonly supplied by a DI Container
DI Containers with Interception

- Castle Windsor
- Unity
- Spring.NET
- LinFu
Using a DI Container

DEMO
Interception
Interception
Interception

Xyz

emit

IFoo

XyzFoo

emit

Xyz

IBar

XyzBar

Xyz
Interception
Adding interceptors

DEMO
Pointcut

IFoo
ConcreteFoo

IBar
ConcreteBar

IBaz
ConcreteBaz

Xyz

Abc

Æøå
Adding a pointcut

DEMO
Objective

- Single Responsibility Principle
- Open/Closed Principle
- Liskov Substitution Principle
- Interface Segregation Principle
- Dependency Inversion Principle

SOLID

- Don’t Repeat Yourself

DRY
Staying SOLID only requires loose coupling

Staying DRY requires dynamic interception