Applying Clean Architecture to ASP.NET Core Apps

In under 30 minutes

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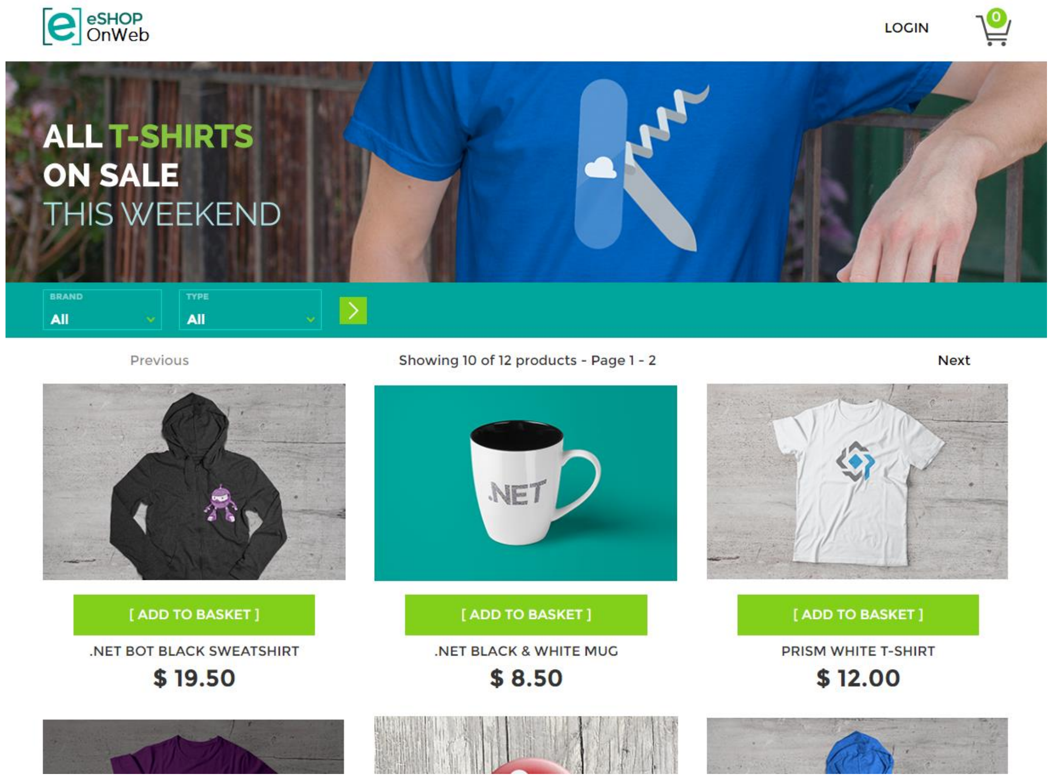
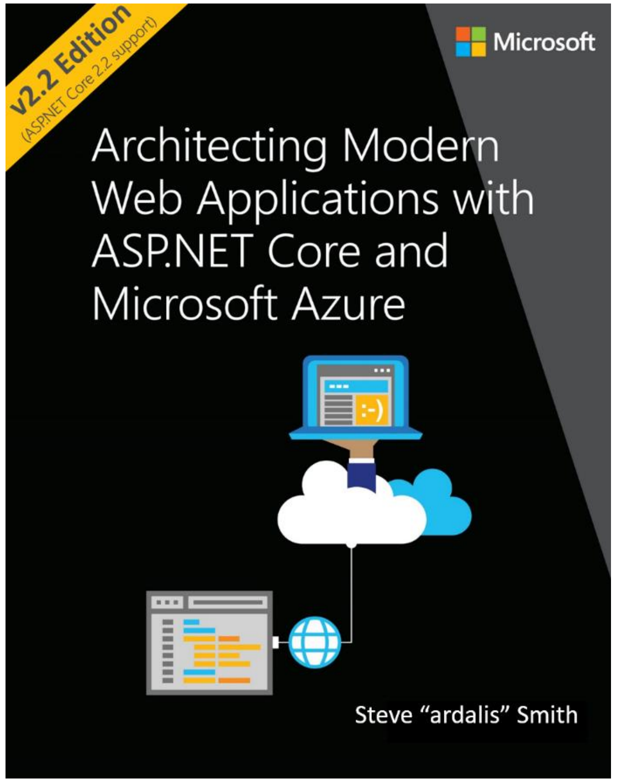
MENTOR | TRAINER | COACH

eShopOnWeb Reference App

http://aka.ms/WebAppArchitecture




v2.2 Edition
(ASP.NET Core 2.2 support)
Microsoft
Architecting Modern Web Applications with ASP.NET Core and Microsoft Azure
Steve "ardalis" Smith

Free Cloud Native eBook

https://dotnet.microsoft.com/learn/azure/architecture

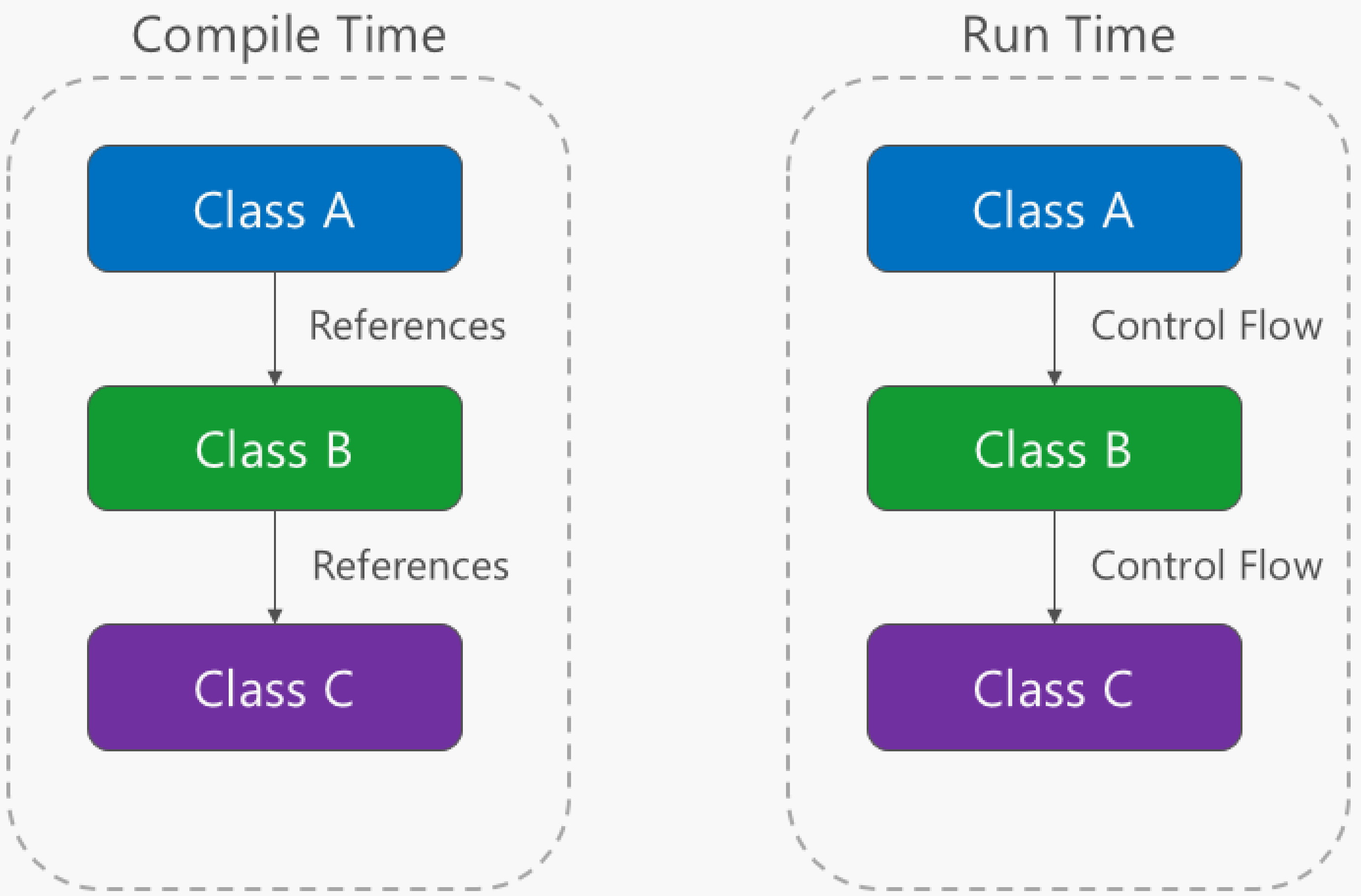
Resources

Clean Architecture Solution Template
https://github.com/ardalis/cleanarchitecture

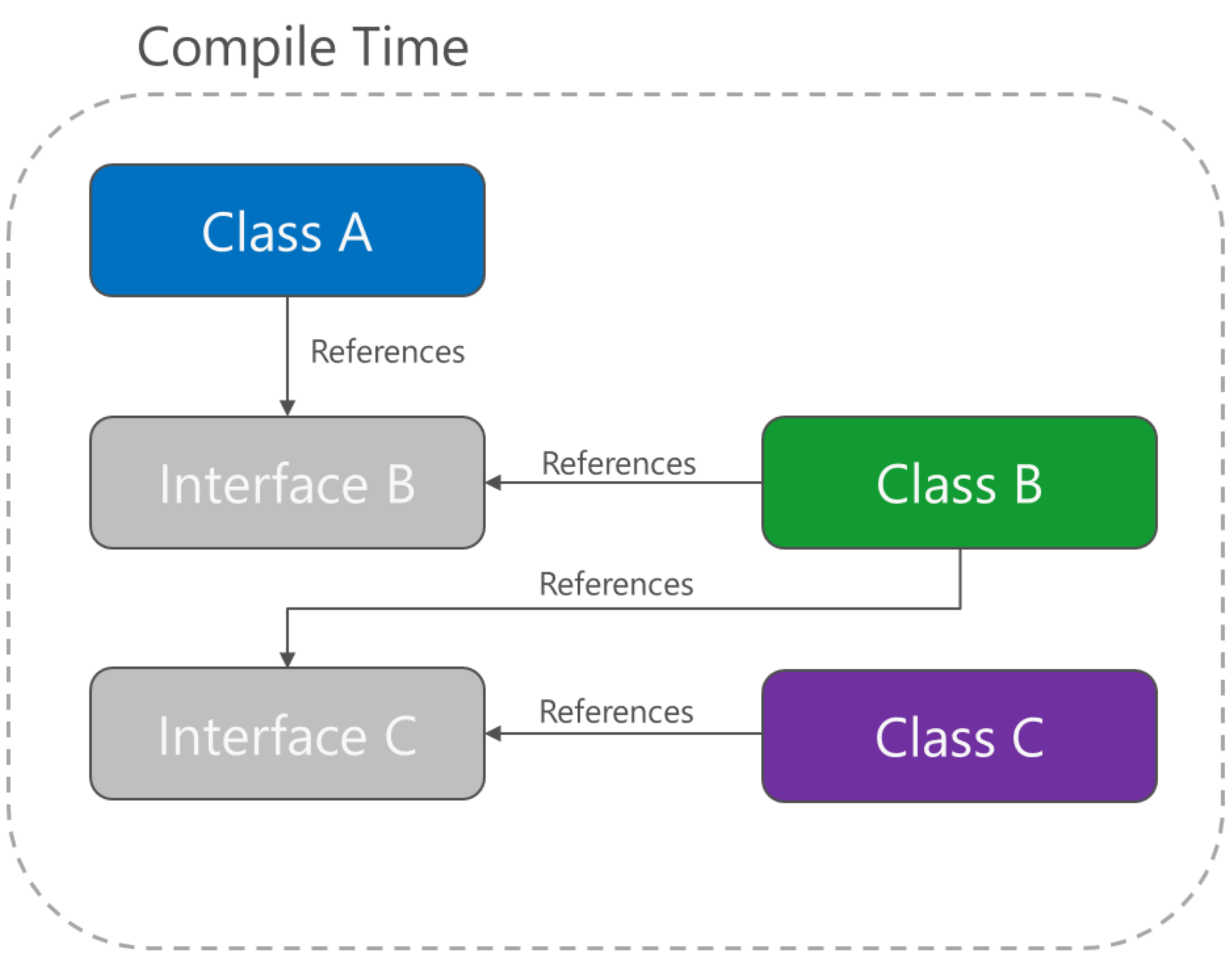
Online Courses (Pluralsight and DevIQ)

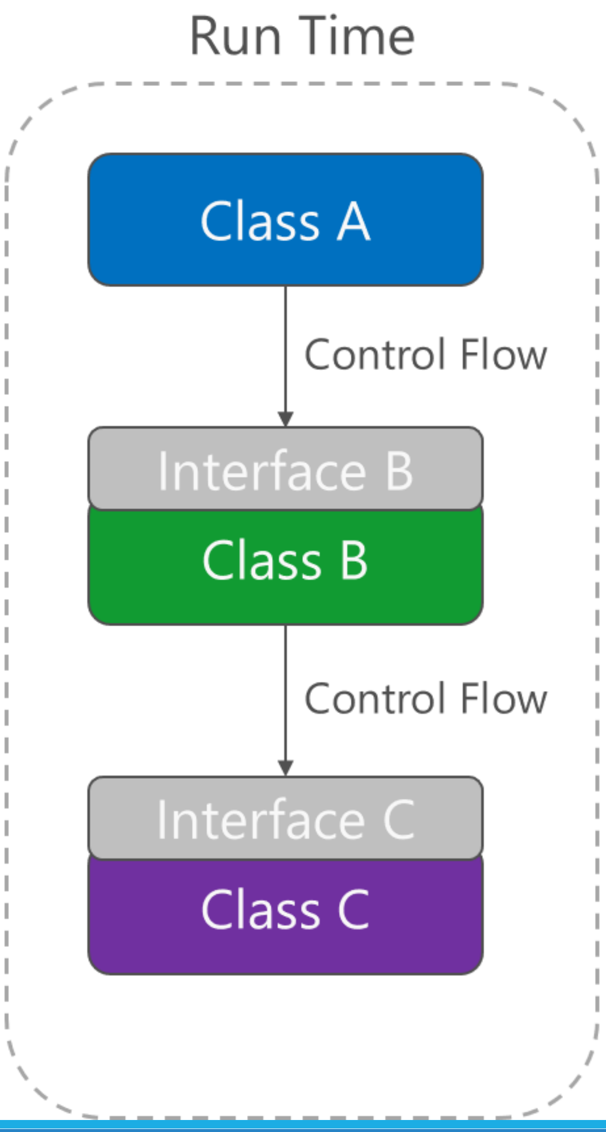
• SOLID Principles of OO Design	https://ardalis.com/ps-stevesmith
• N-Tier Architecture in C#	https://ardalis.com/ps-stevesmith
• DDD Fundamentals	https://ardalis.com/ps-stevesmith
• ASP.NET Core Quick Start	http://aspnetcorequickstart.com/
Weekly Dev Tips Podcast	http://weeklydevtips.com/
Microsoft Architecture eBook/sample	http://aka.ms/WebAppArchitecture
Group Coaching for Developers	https://devbetter.com/

Direct Dependency Graph



Inverted Dependency Graph





Make the right thing easy and the wrong thing hard

FORCE DEVELOPERS INTO A “PIT OF SUCCESS”

Make the right thing easy and the wrong thing hard.

UI classes shouldn’t depend directly on infrastructure classes

- How can we structure our solution to help enforce this?

Make the right thing easy and the wrong thing hard.

Business/domain classes shouldn't depend on infrastructure classes

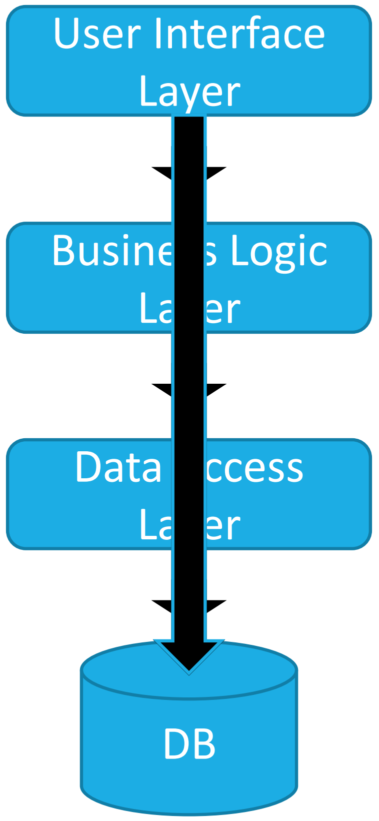
- How can our solution design help?

Make the right thing easy and the wrong thing hard.

Repetition of (query logic, validation logic, policies, error handling, anything) is a problem

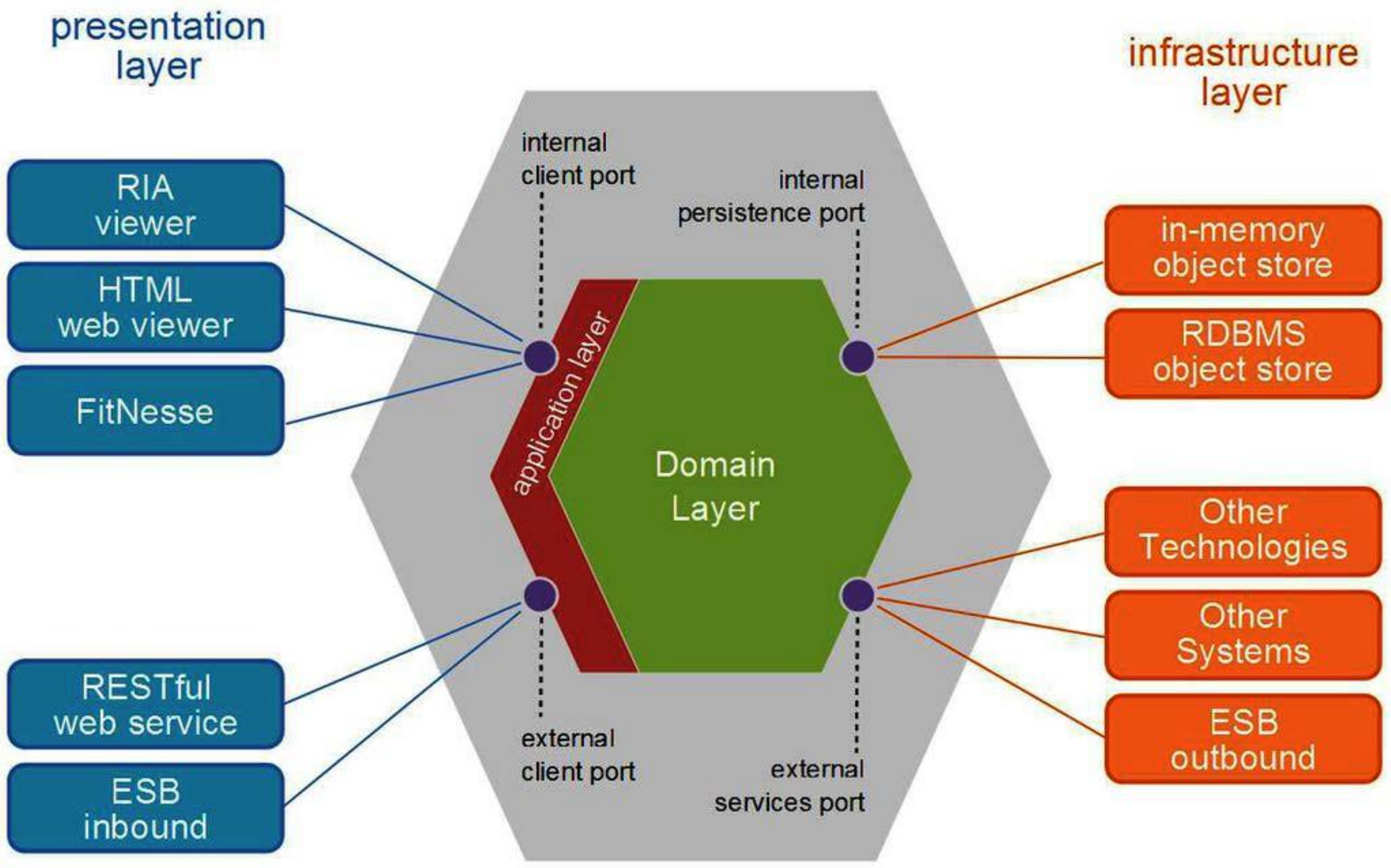
- What patterns can we apply to make avoiding repetition easier than copy/pasting?

Transitive Dependencies



Everything

Depends on the *database*


presentation layer
infrastructure layer
RIA viewer
HTML web viewer
FitNesse
RESTful web service
ESB inbound
internal client port
internal persistence port
application layer
Domain Layer
external client port
external services port
in-memory object store
RDBMS object store
Other Technologies
Other Systems
ESB outbound

The Core Project (domain model)

Minimal dependencies – none on *Infrastructure*.

What Goes in Core:

Interfaces

Entities

Value Objects

Aggregates

Domain Services

Exceptions

Domain Events

Event Handlers

Specifications

The Infrastructure Project

All dependencies on out-of-process resources.

What Goes in Infrastructure:

Repositories

EF (Core) DbContext

Cached Repositories

System Clock

Web API Clients

File System Accessors

Logging Adapters

Email/SMS Sending

Other Services

Interfaces

The Web Project

All dependencies on out-of-process resources.

What Goes in Web:

Controllers | Views | Or | Razor Pages

ViewModels | ApiModels | BindingModels

Filters | Binders | Tag/Html Helpers

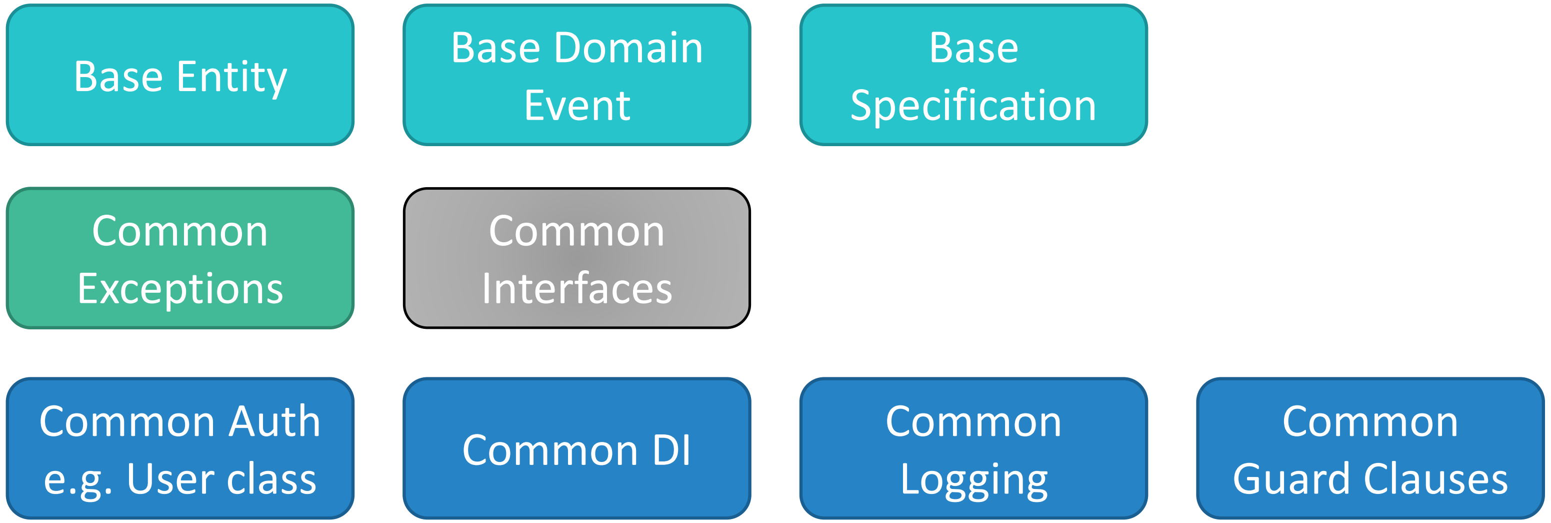
Other Services | Interfaces

Sharing Between Solutions:
Shared Kernel

Common Types May Be Shared Between Solutions. Will be referenced by Core project(s).

Ideally distributed as **Nuget Packages**.

What Goes in Shared Kernel:



Guard Clauses?

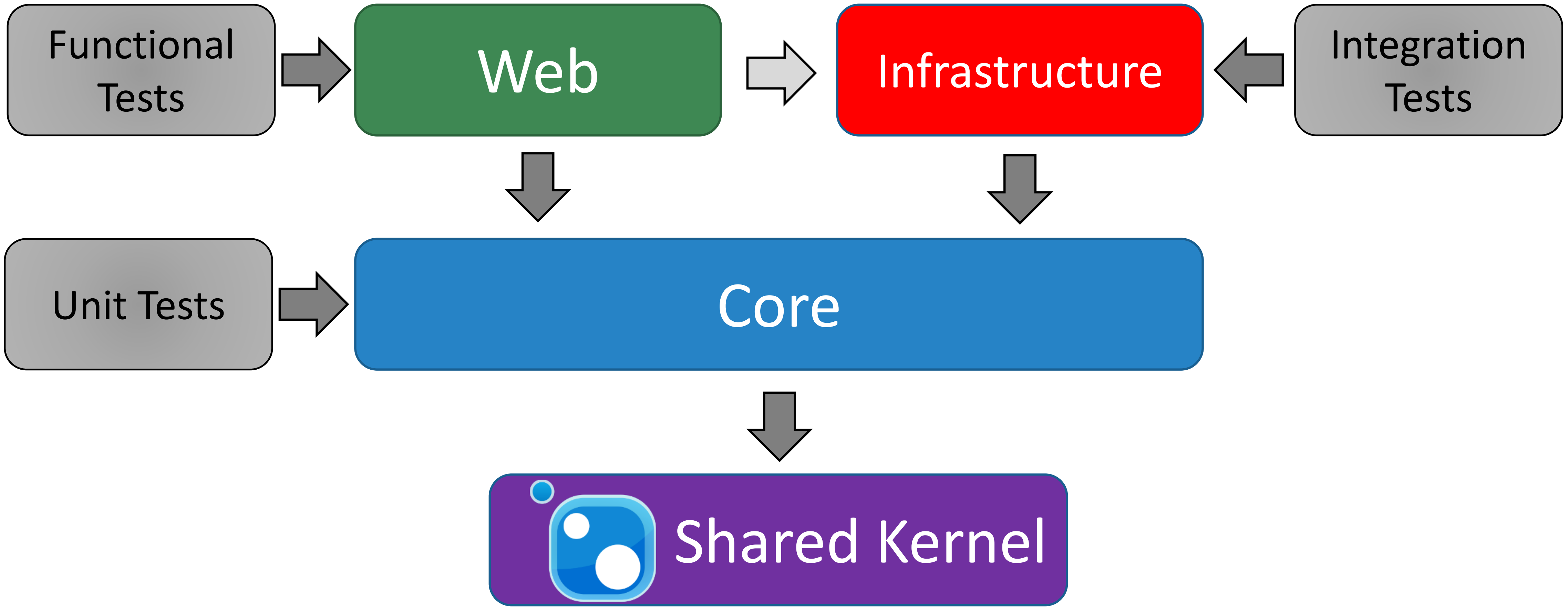
Simple checks for input that use common rules and exceptions.

Nuget Package: Ardalis.GuardClauses (https://github.com/ardalis/GuardClauses)

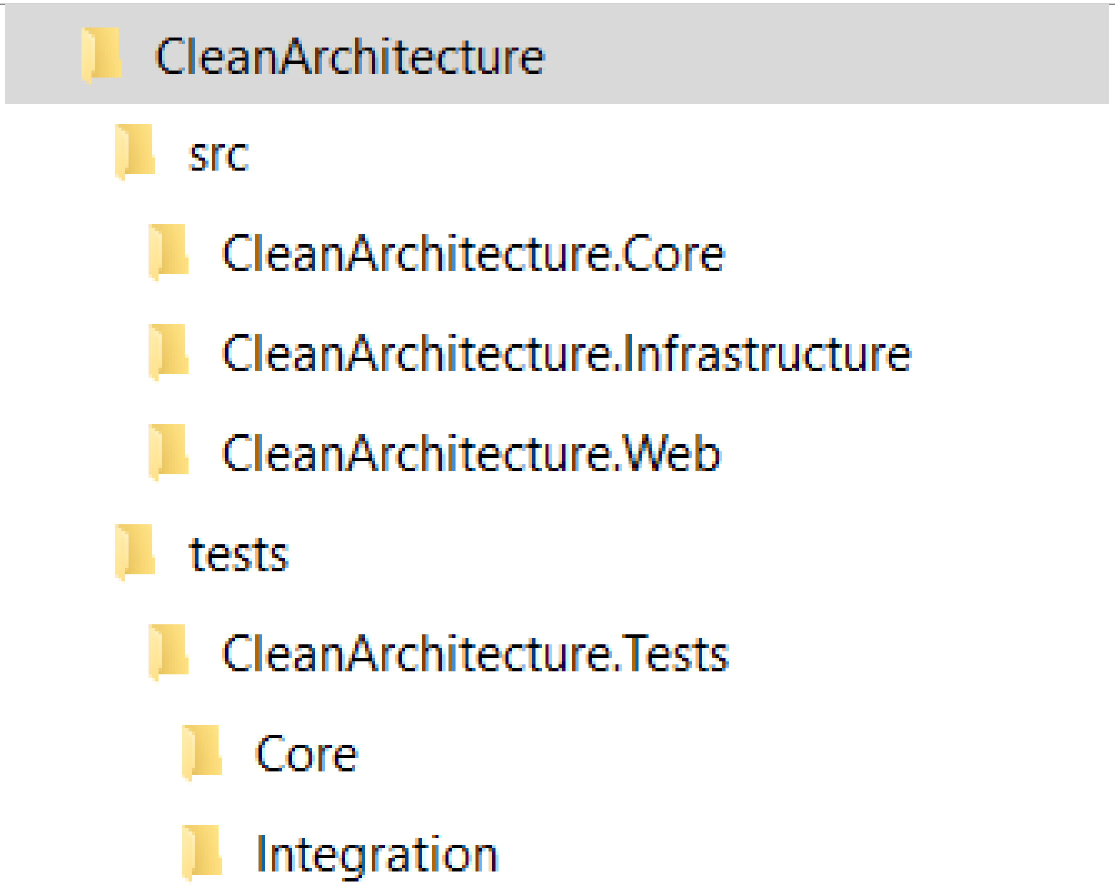
Example:

```
public void ProcessOrder(Order order)
{
    Guard.Against.Null(order, nameof(order));
    // process order here
}
```

Solution Structure – Clean Architecture



Typical (Basic) Folder Structure



```
CleanArchitecture
  src
    CleanArchitecture.Core
    CleanArchitecture.Infrastructure
    CleanArchitecture.Web
  tests
    CleanArchitecture.Tests
      Core
      Integration
```

Code Walkthrough

GITHUB.COM/ARDALIS/CLEANARCHITECTURE

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Thanks!

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