

Modulith instead of Monolith

Pragmatically Towards Microservices

Hendrik Lösch



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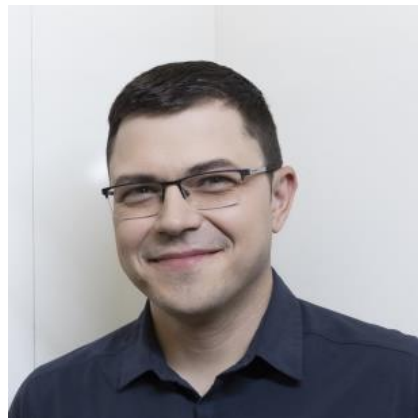
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slideshare.net/HendrikLsch1



Refactoring: Bestehende Architekturen restrukturieren

Von: Hendrik Lösch · Vor 3 Wochen veröffentlicht

3 Std. 5 Min.



Einführung in die Softwarearchitektur 1: Grundlagen, Begriffe und ausgewählte Tools

Von: Hendrik Lösch · Veröffentlicht: 5. Juni 2019

2 Std. 26 Min.



Einführung in die Softwarearchitektur 2: Architekturmuster

Von: Hendrik Lösch · Veröffentlicht: 18. Juni 2019

1 Std. 55 Min.



Grundlagen der Programmierung: Clean Code und SOLID

Von: Hendrik Lösch · Aktualisiert: 17. Juni 2019

3 Std. 18 Min.

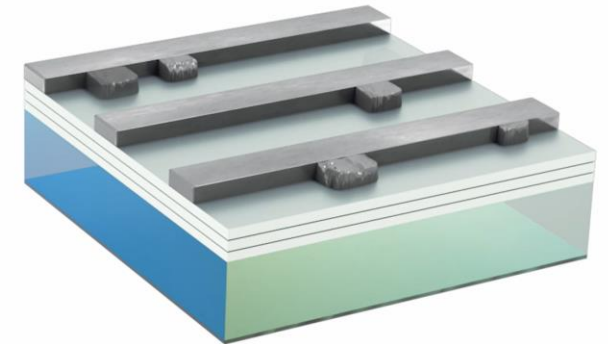
<https://www.linkedin.com/learning/instructors/hendrik-losch>

Example

Mask Repair

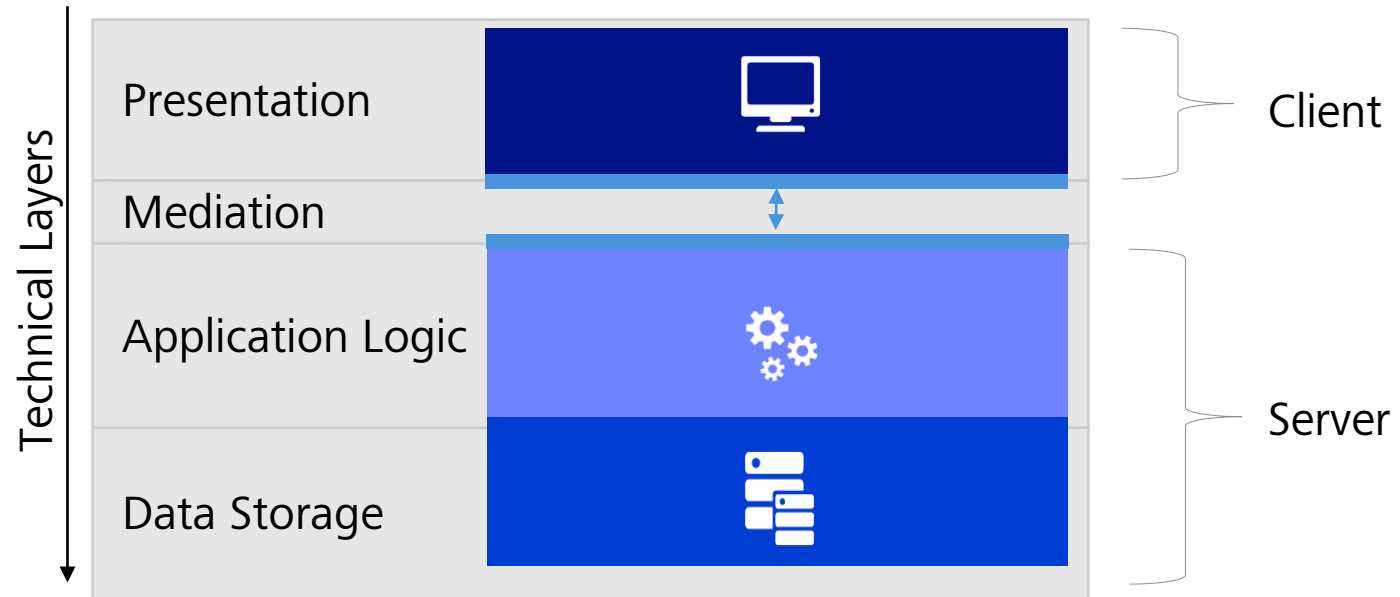


Challenge | Number and complexity of pattern defects on EUV masks are increasing, which raises the necessity for reliable repair of high-end photomasks.



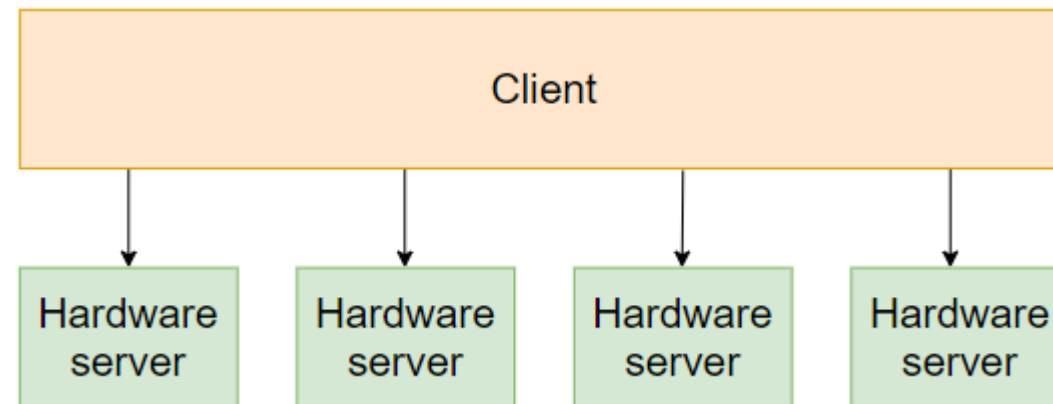
Example

What we first thought we have



Example

Basic structure 2020



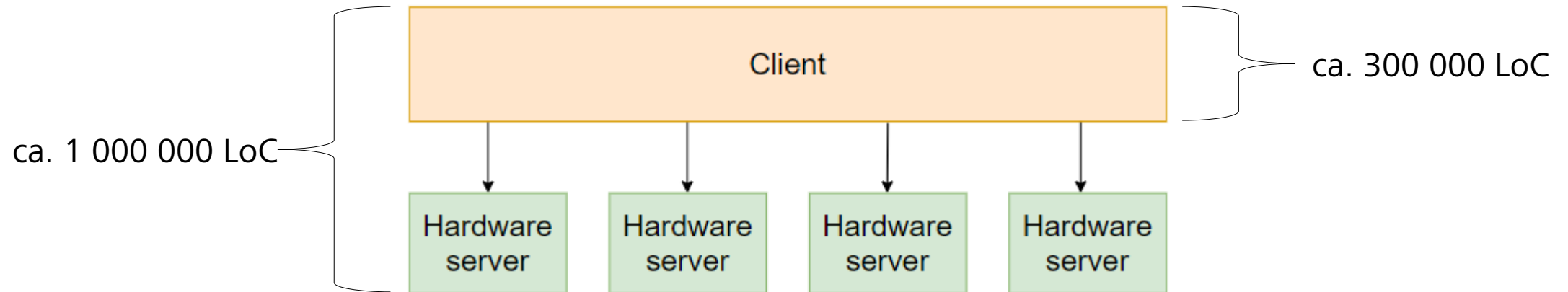
WinForms, C#, .NET 4.8

COM

C++

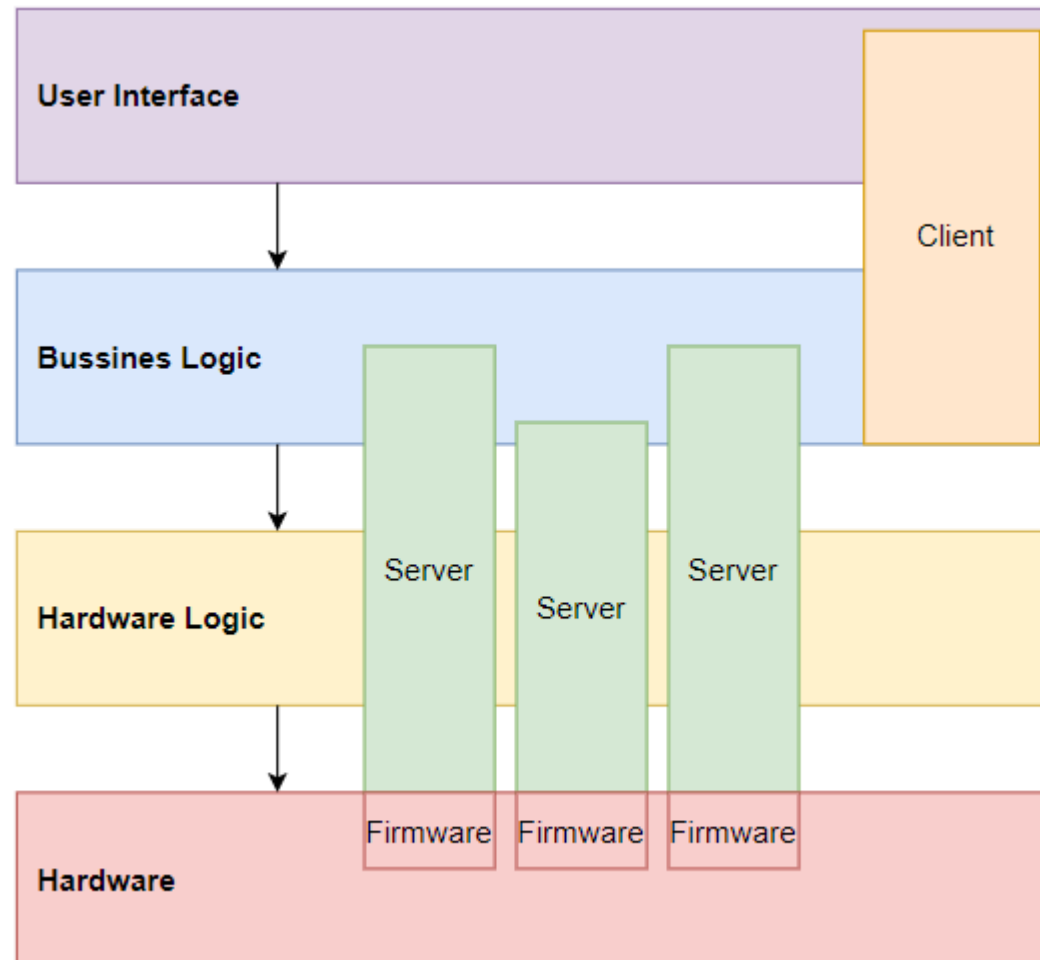
Example

Basic structure 2020



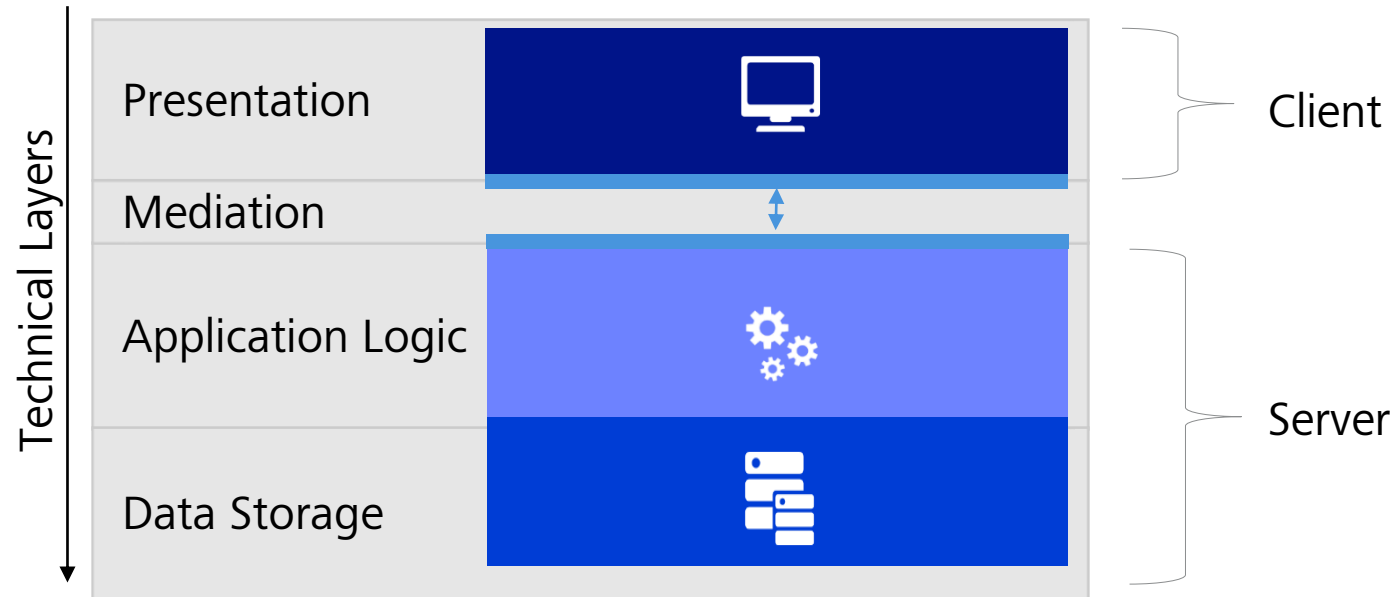
Example

Basic structure 2020

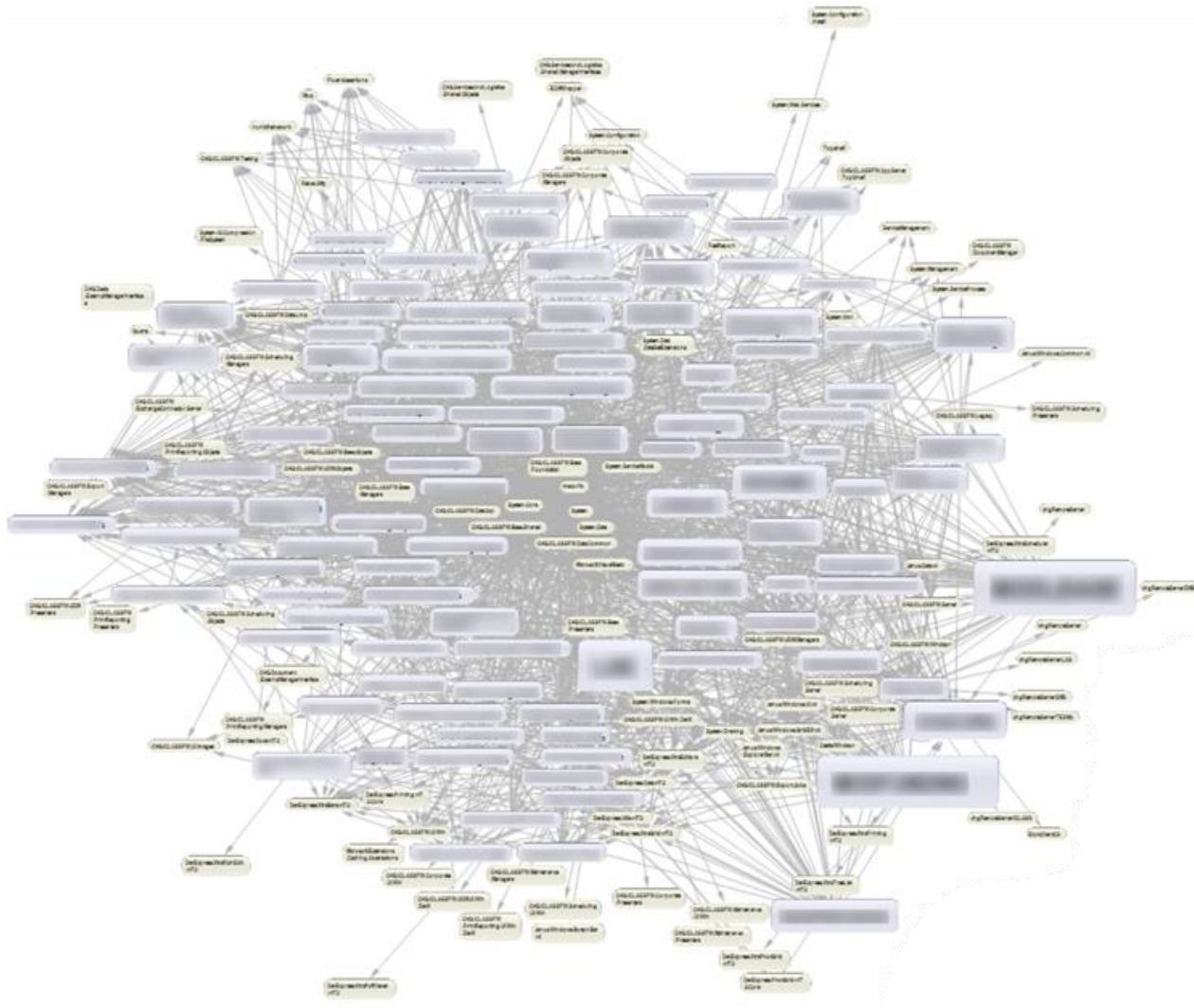


Example

What we first thought we have

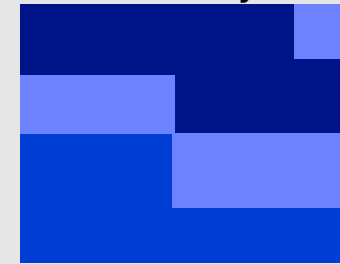


The Monolith



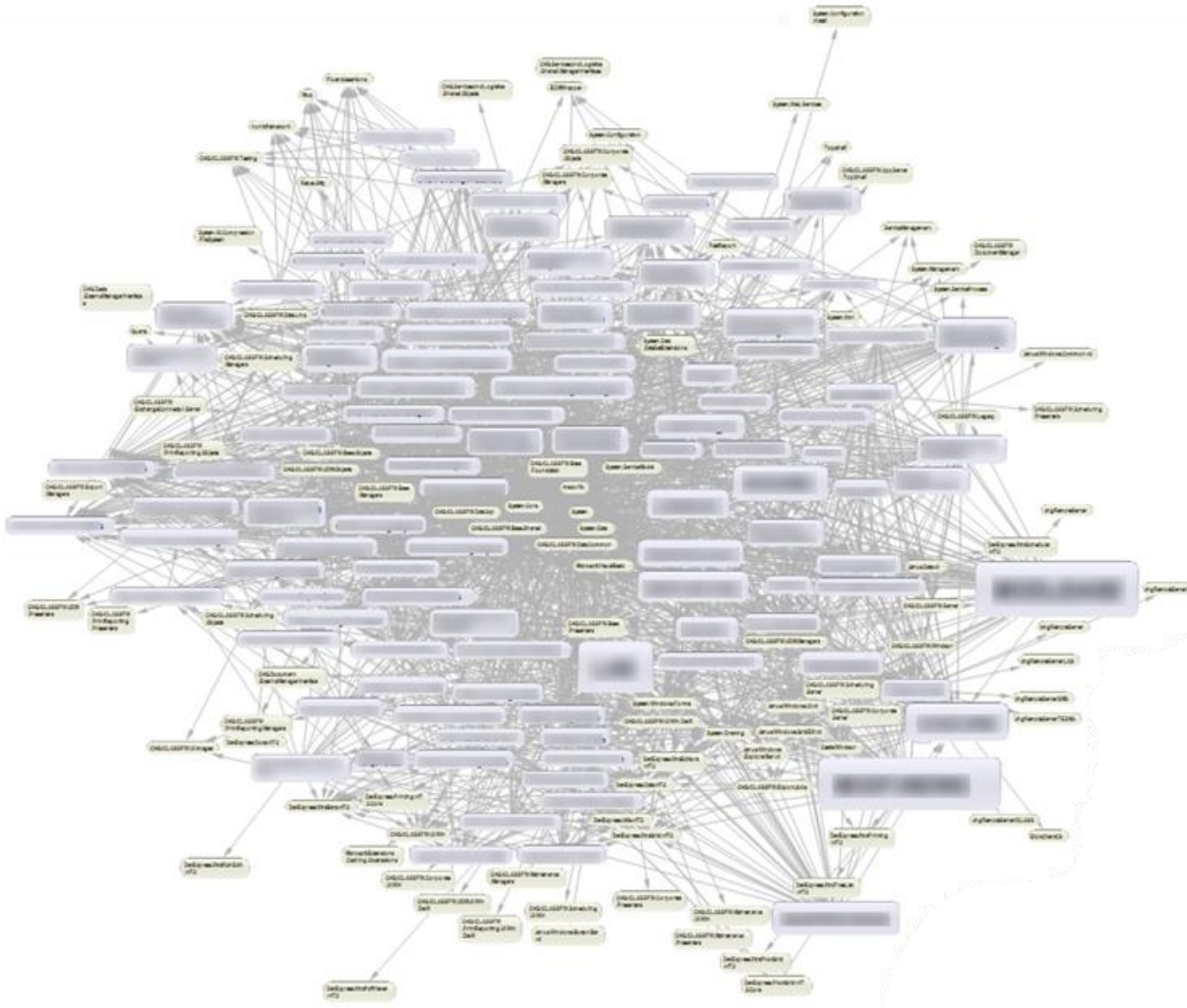
Runtime Environment

Software System



The Monolith

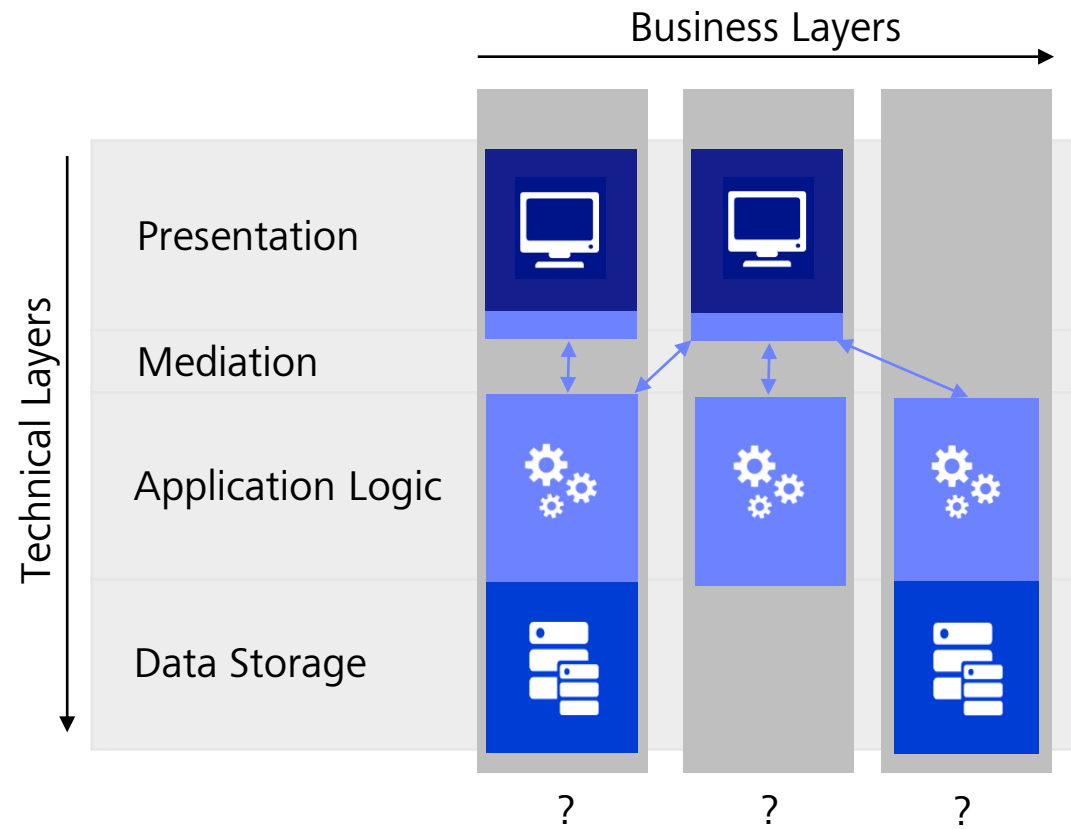
(Some) Disadvantages (if done wrong)



- ✗ „All or Nothing“ - Deployment
- ✗ Limited scalability
- ✗ Compatibility of all components is mandatory
- ✗ Difficult to adopt new technologies
- ✗ Long build-times
- ✗ Large codebase

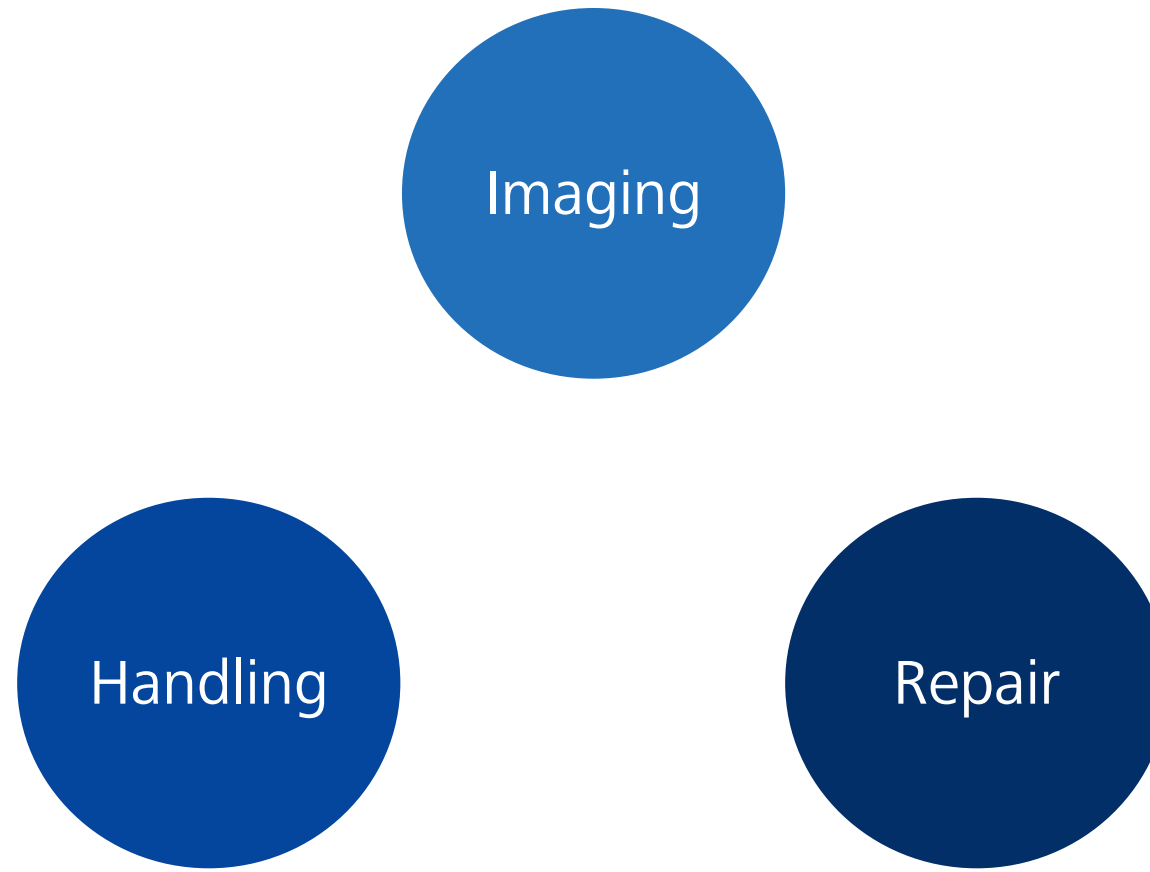
Concept

Business and Technical Layers



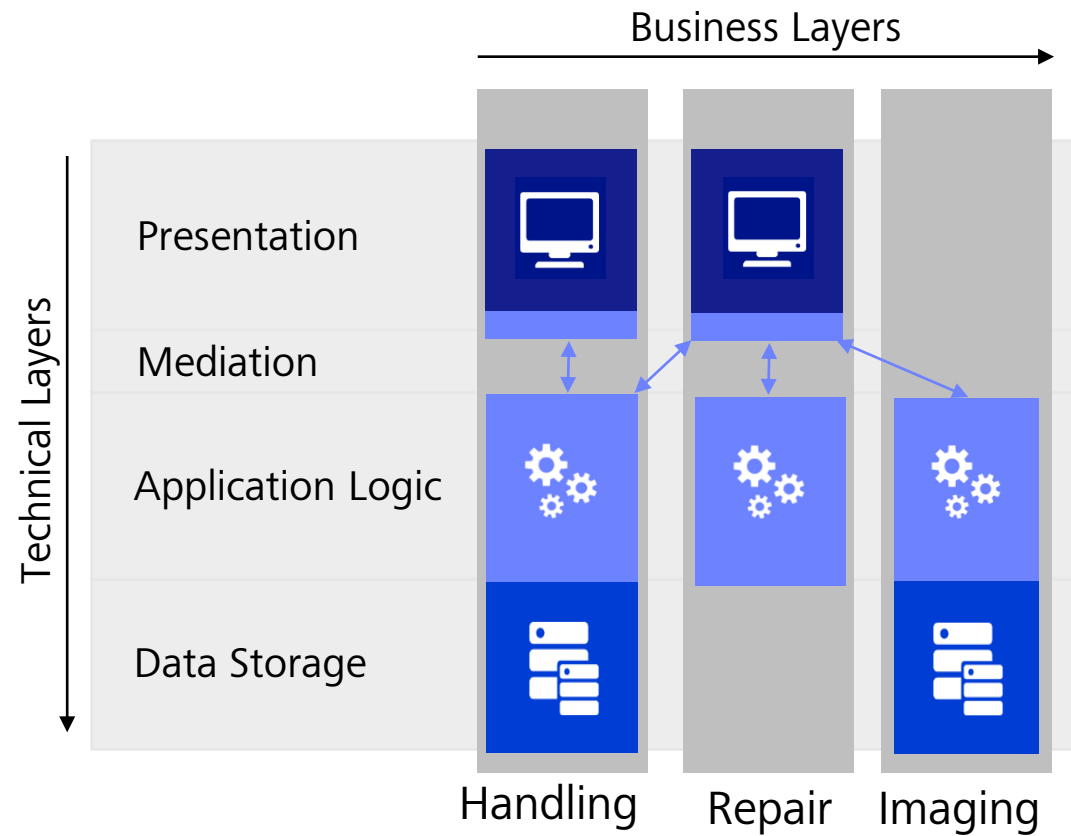
Contexts

Bounded Contexts



Concept

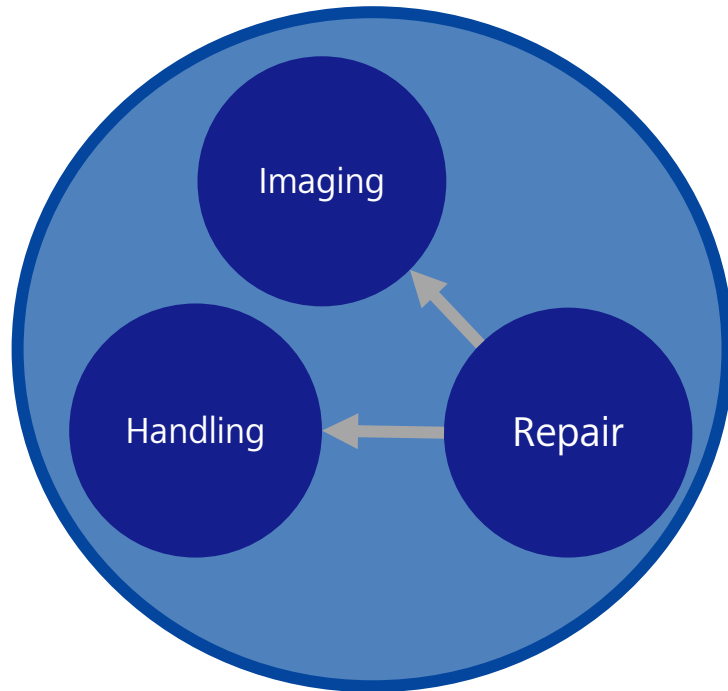
Business and Technical Layers



Concept

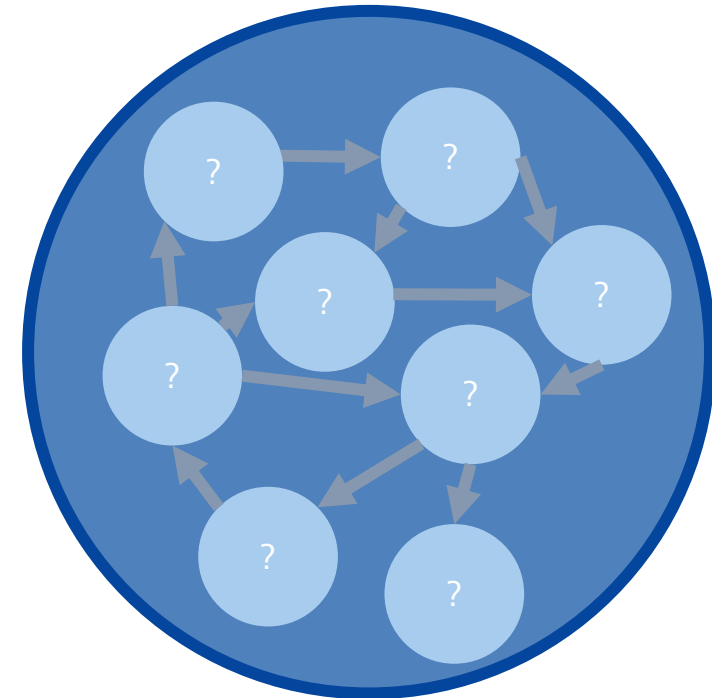
Finding the right architecture

Modulith



vs.

Unplanned Monolith



Internal
Communication

Software
Modules

Process
Memory

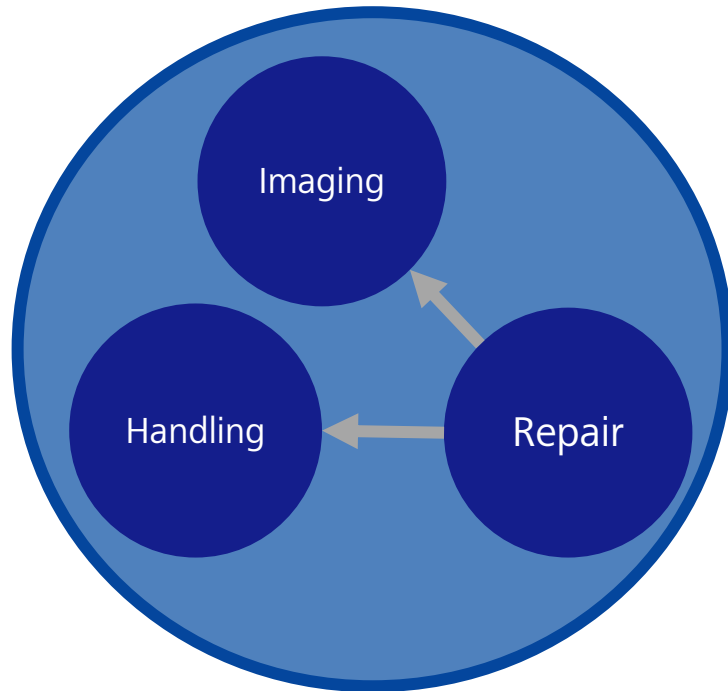
Deployment
Units

Components

Concept

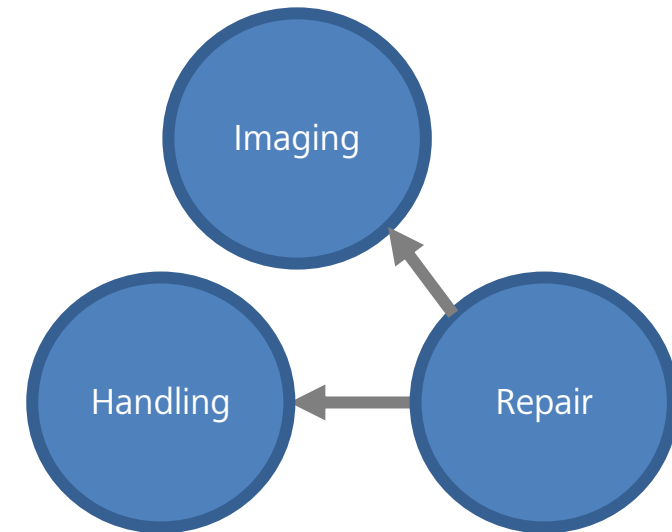
Modulith or Microservices

Modulith



vs.

Microservices



Internal
Communication

Software
Modules

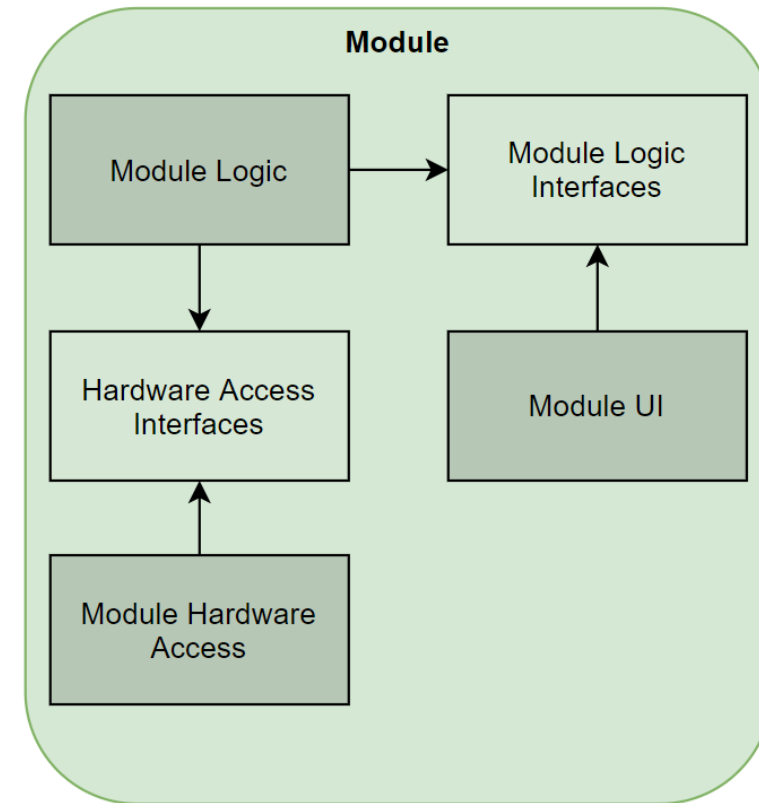
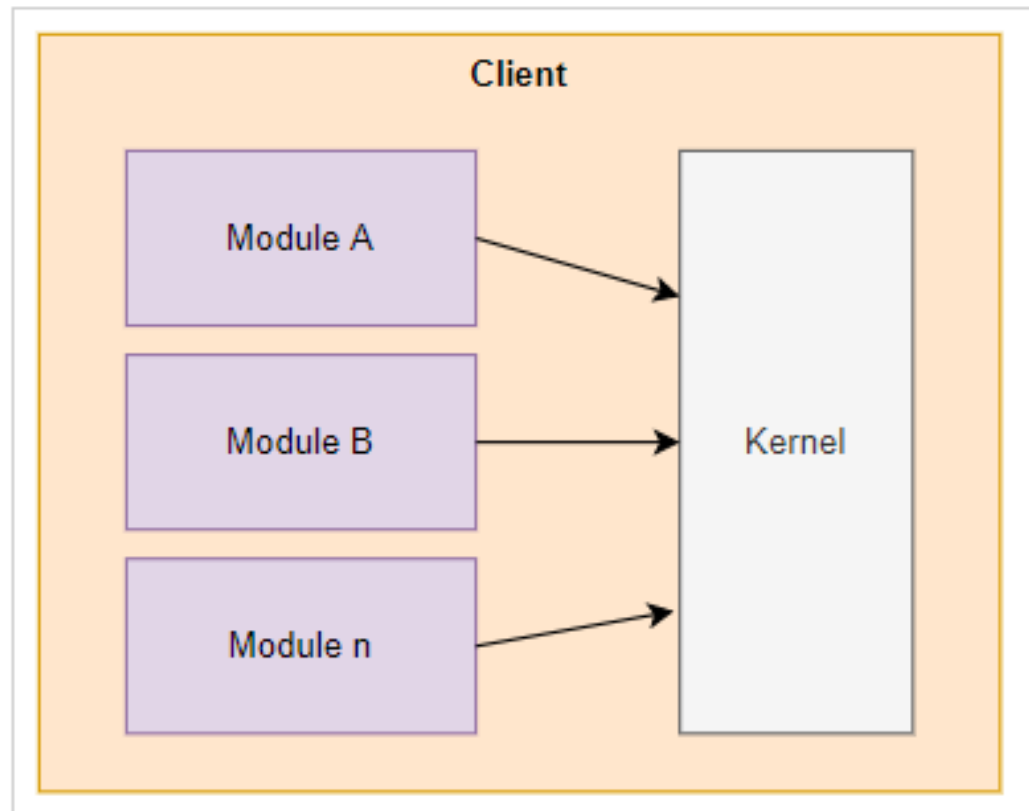
Process
Memory

Deployment
Units

External
Communication

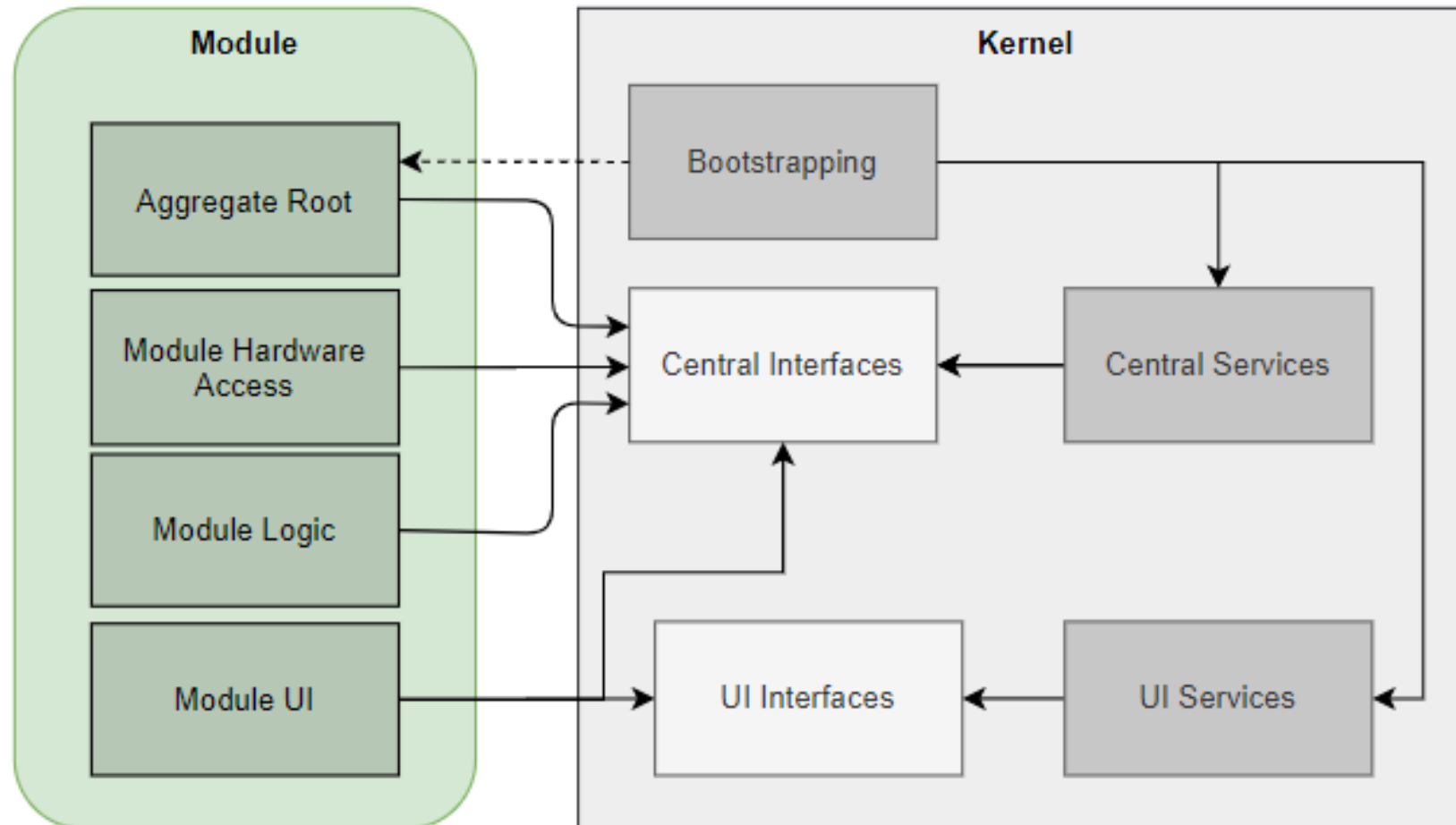
Example

Kernel & Modules



Example

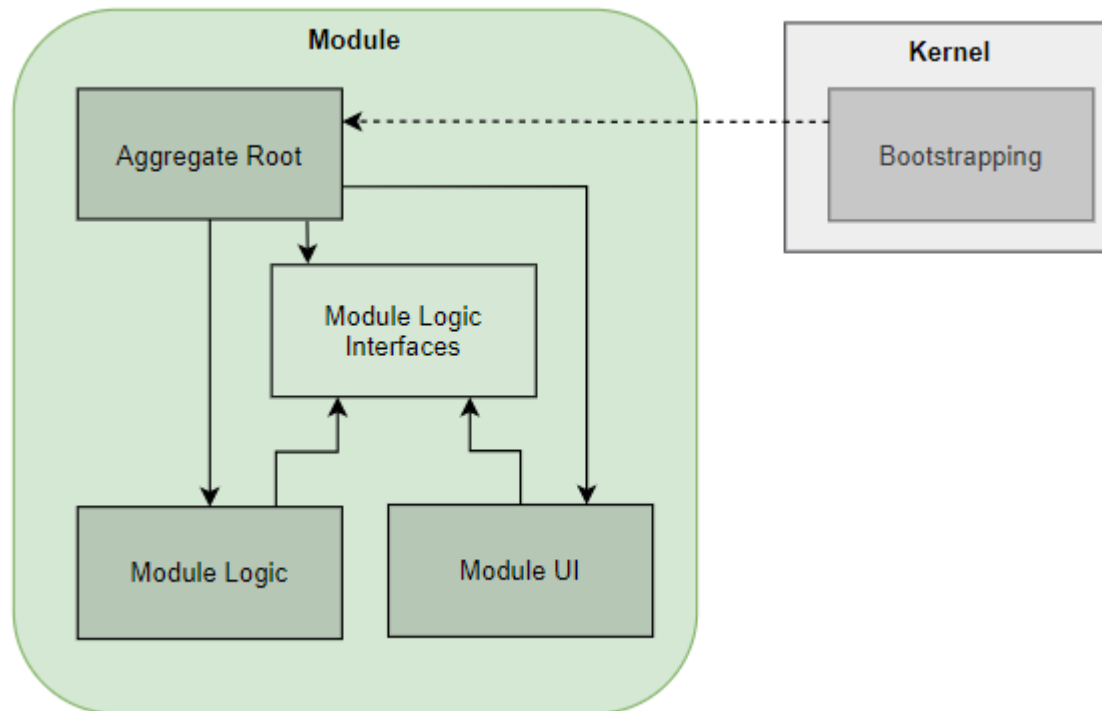
Integrating Modules



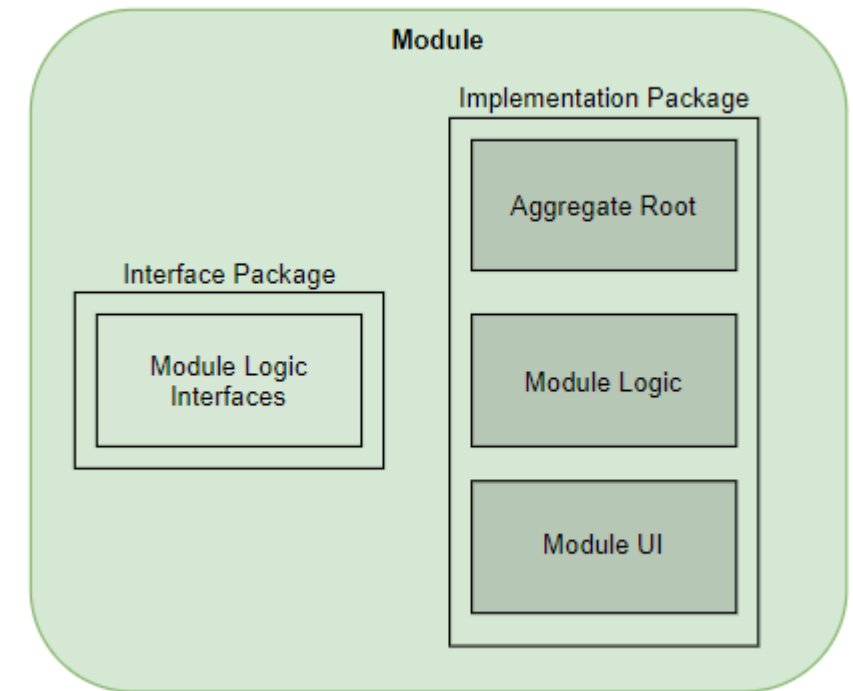
Example

Distribution and Deployment

Logical View

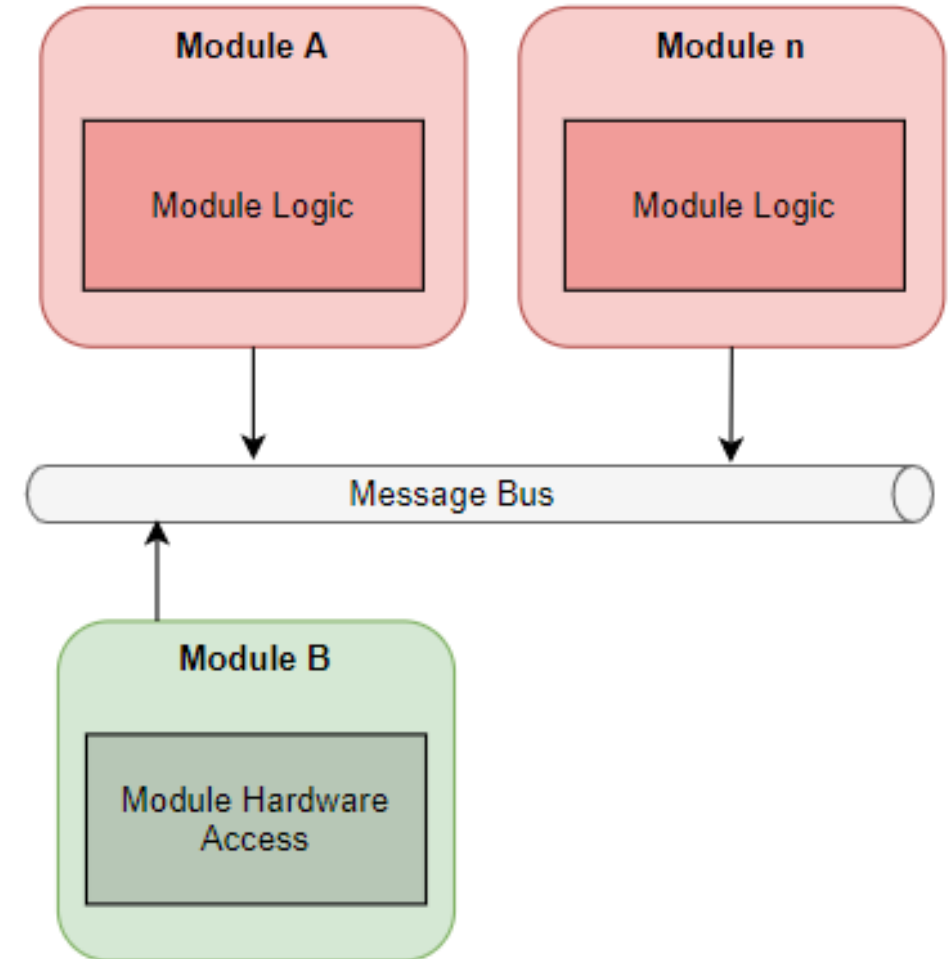
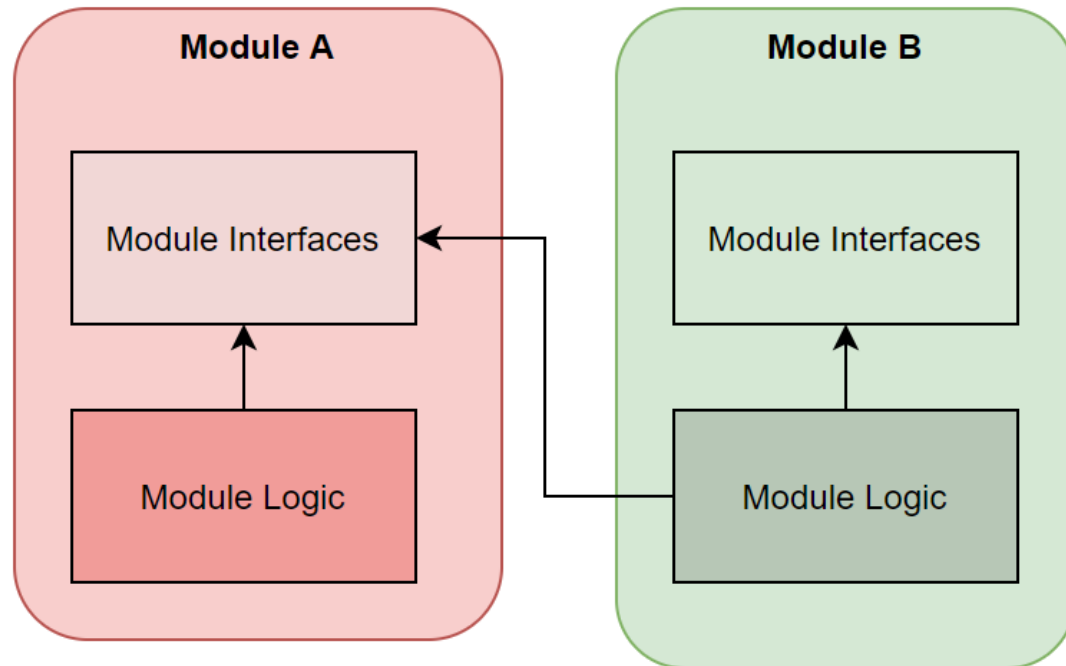


Packaging View



Example

Module Communication

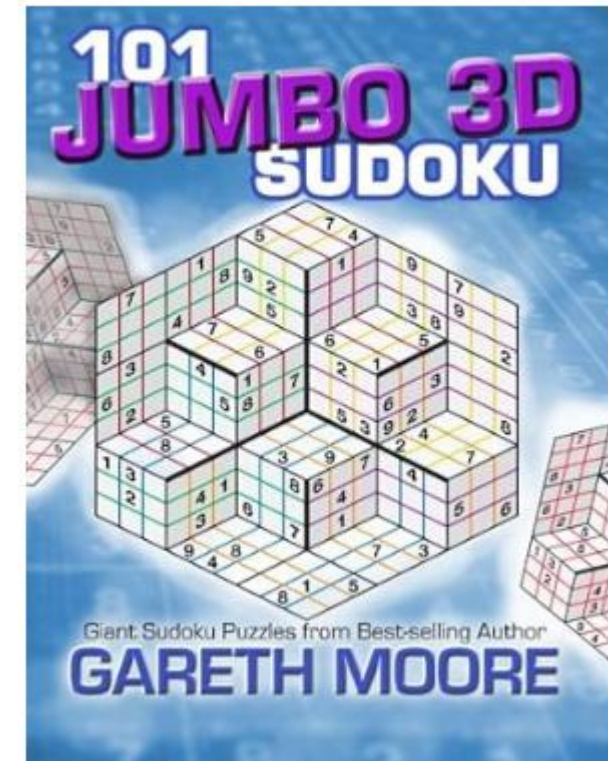
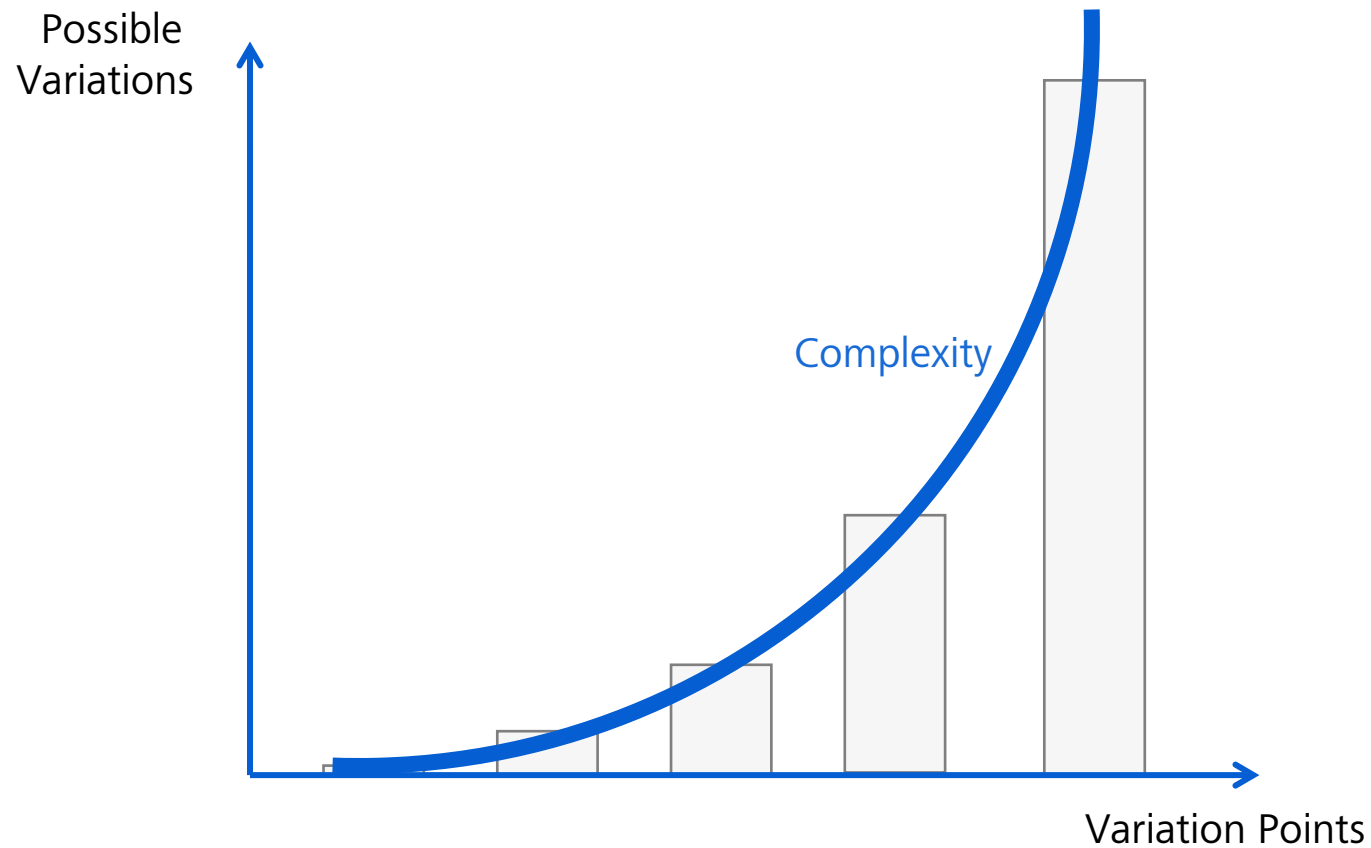


Example Productlines



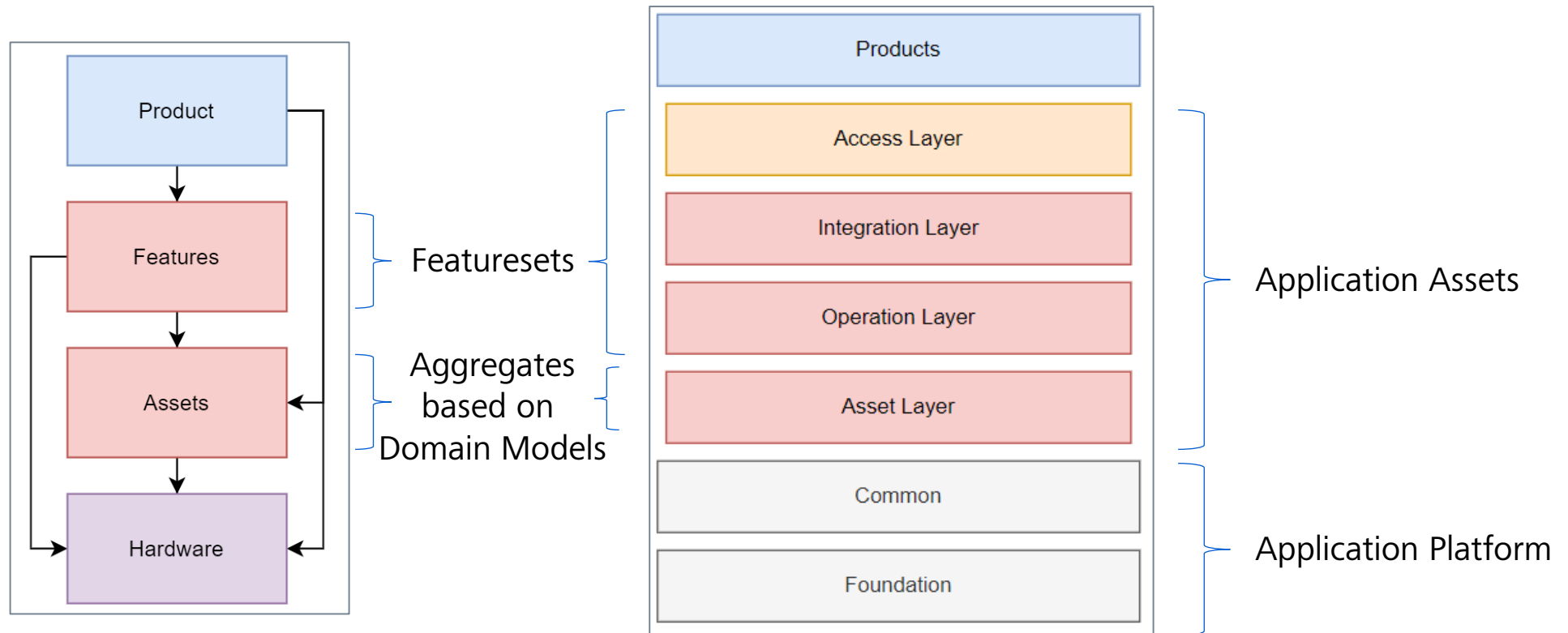
Product Line Engineering

Exploding Complexity



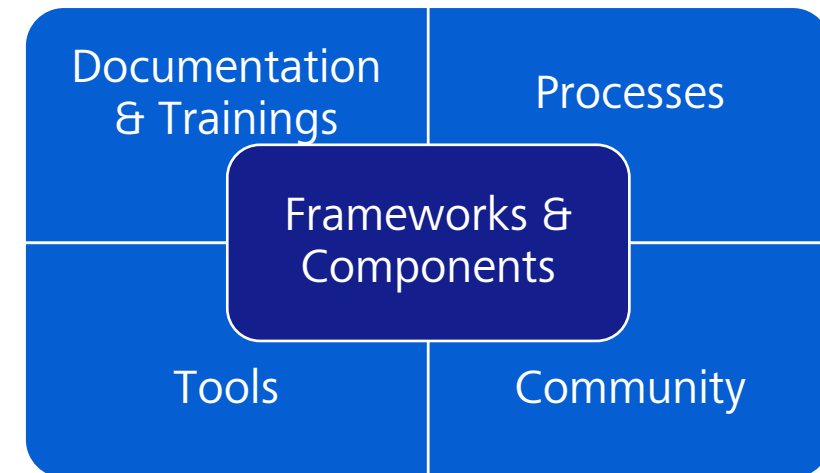
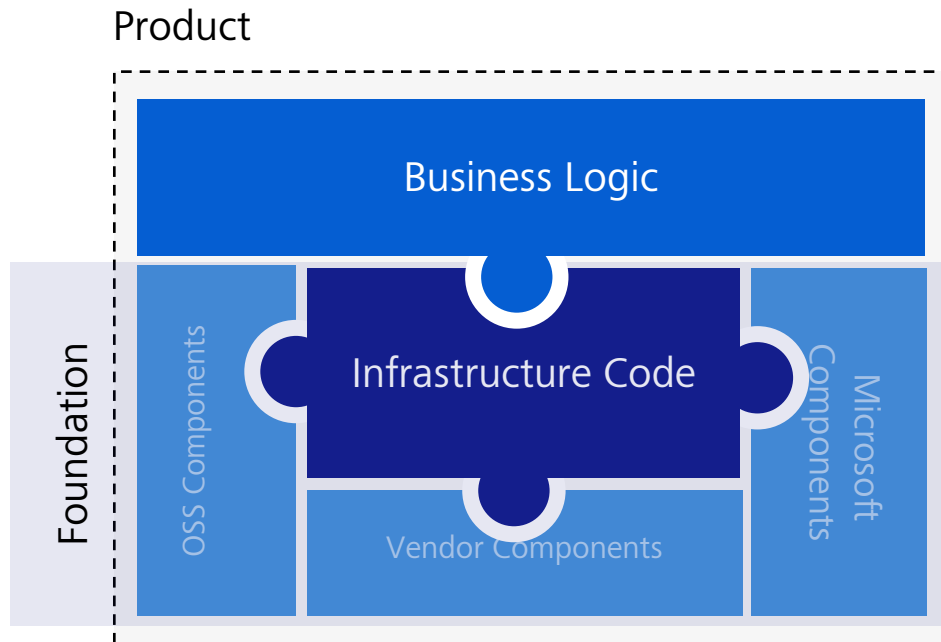
Example

Architecture Layers



Example

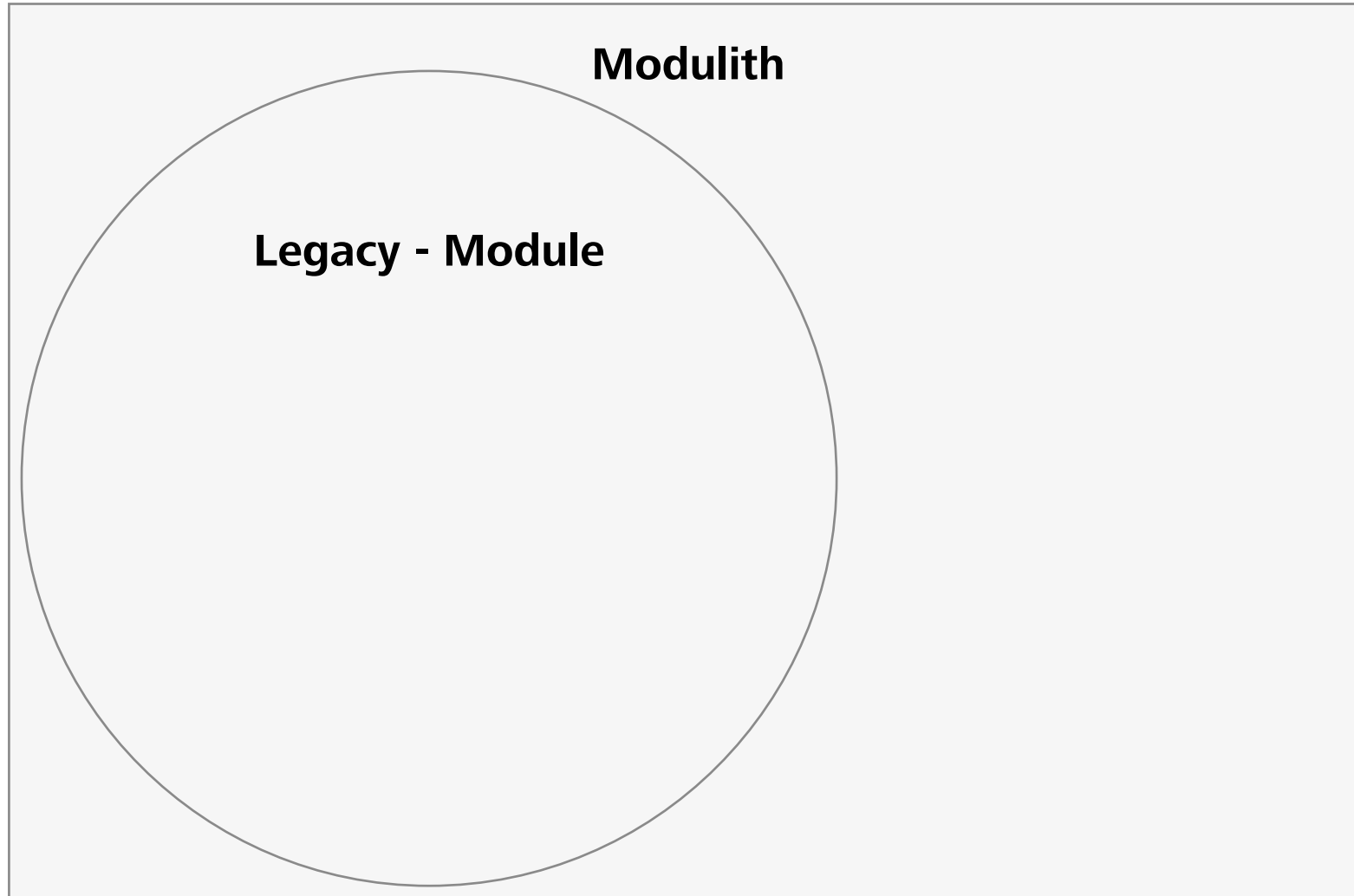
Software Foundation



Monolith

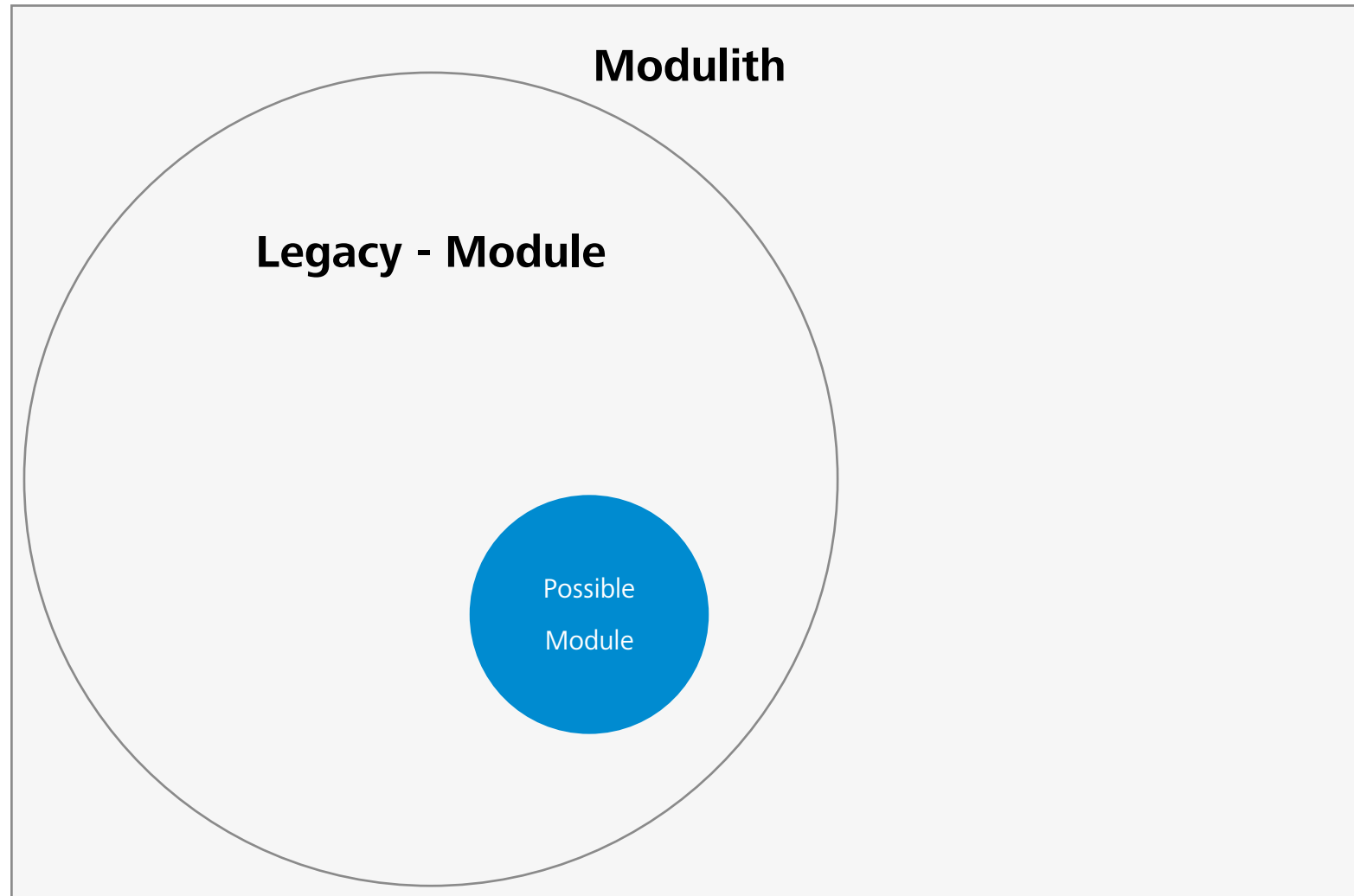
Restructuring Strategy

Change the legacy code into a module



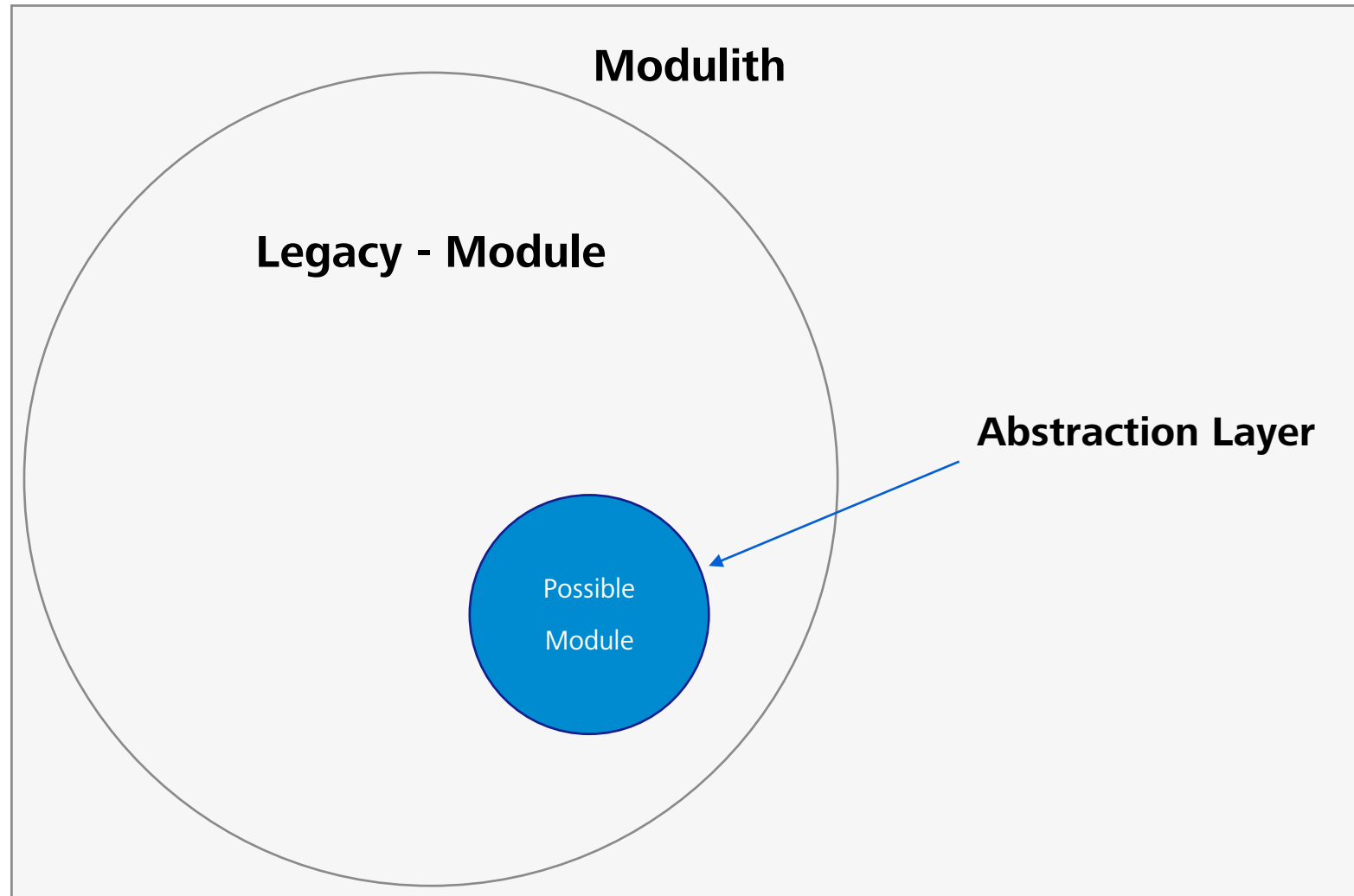
Restructuring Strategy

Identify possible module



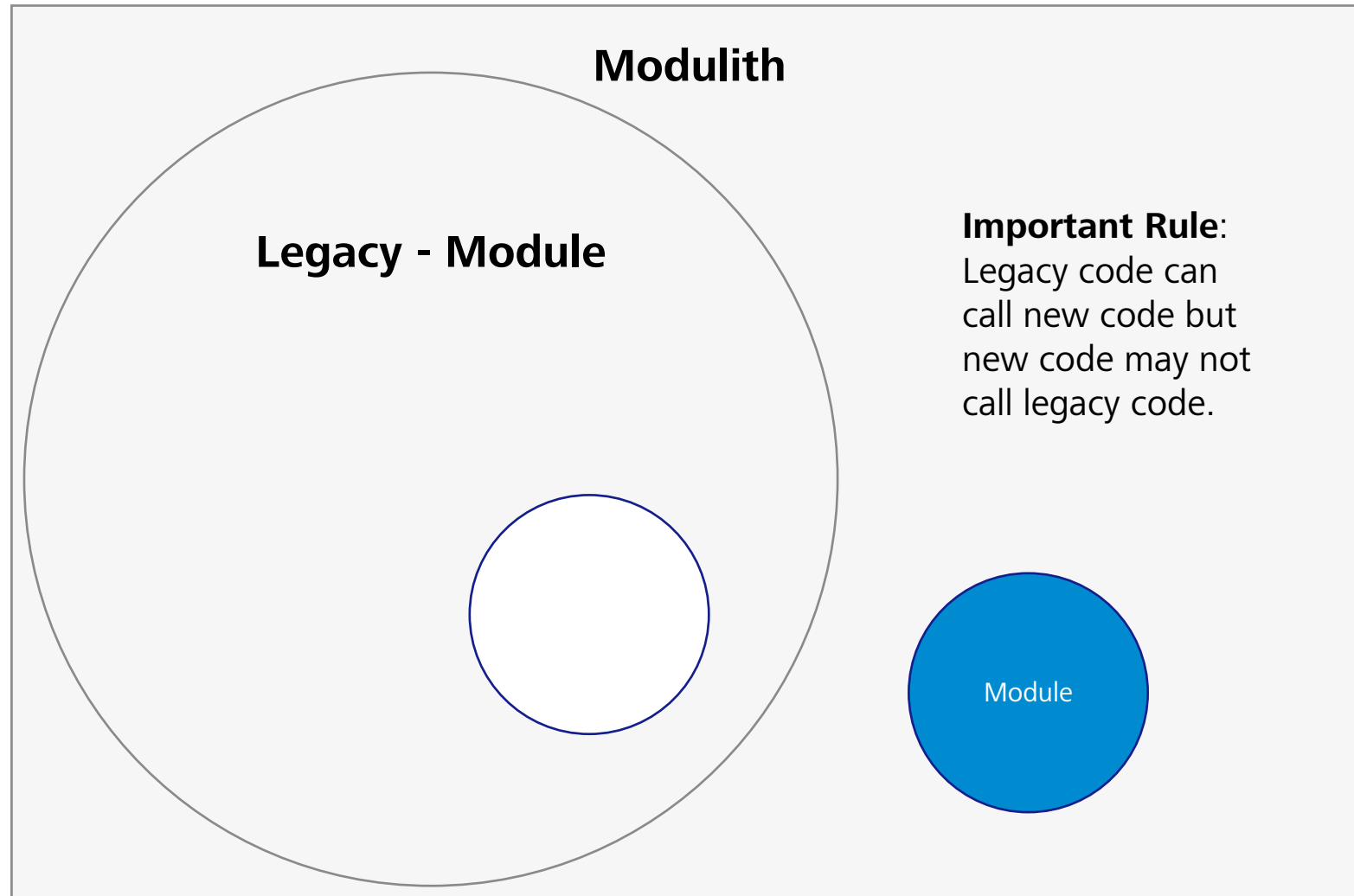
Restructuring Strategy

Identify possible module



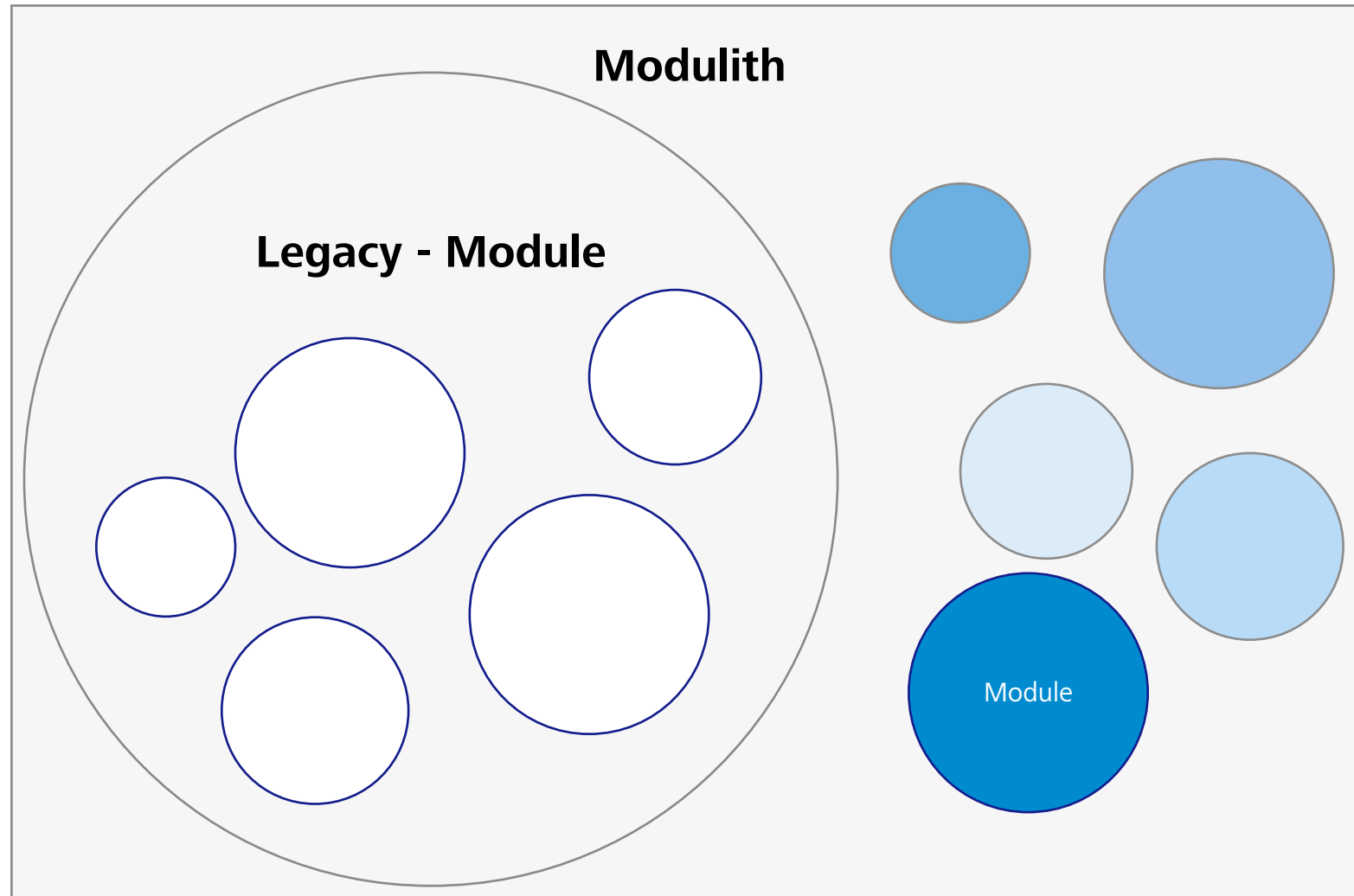
Restructuring Strategy

Extract Module



Restructuring Strategy

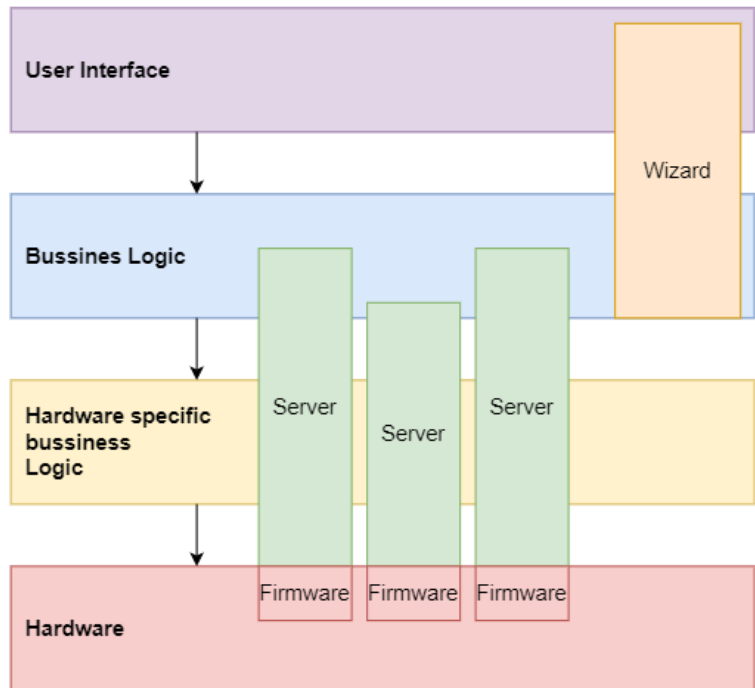
Continue



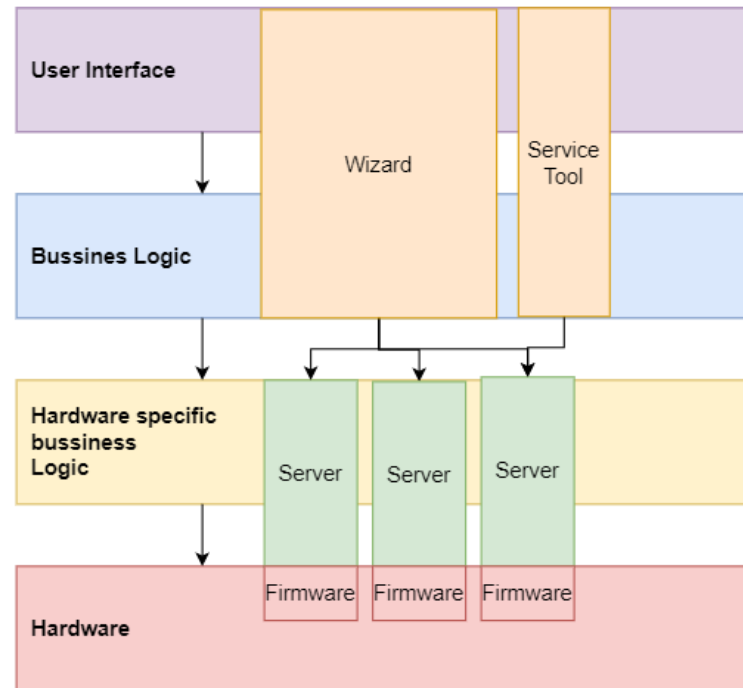
Example

Migration with Moduliths and (Micro) Services

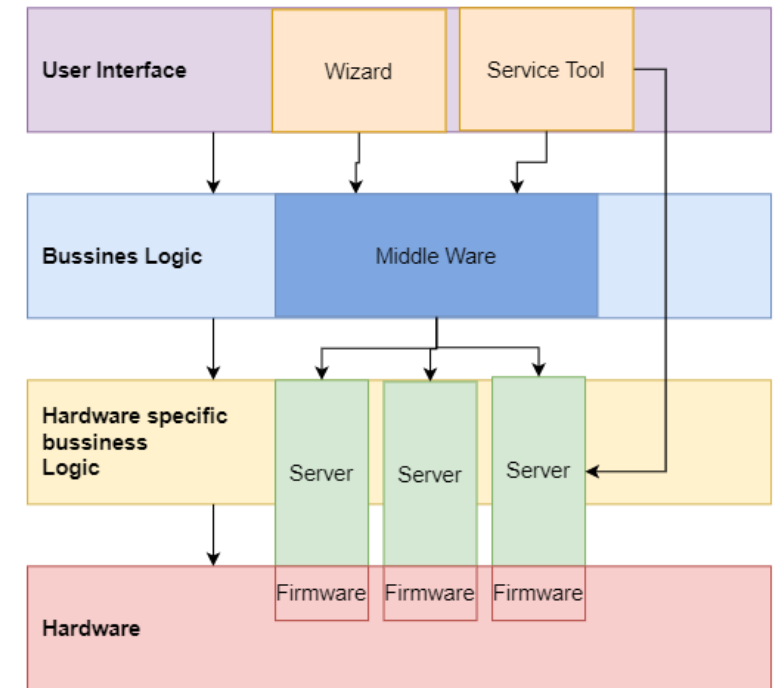
Starting Point



Step 2



Step 3





Seeing beyond