Please

Ask questions through the app

Rate Session

Thank you!

Building resilient frontend architecture

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Why do we rewrite software?

Why do we usually rewrite code?

1. Inexperience
2. It's fun
3. Better solution available
4. Technical Debt

Old libraries?

Code I didn't write?

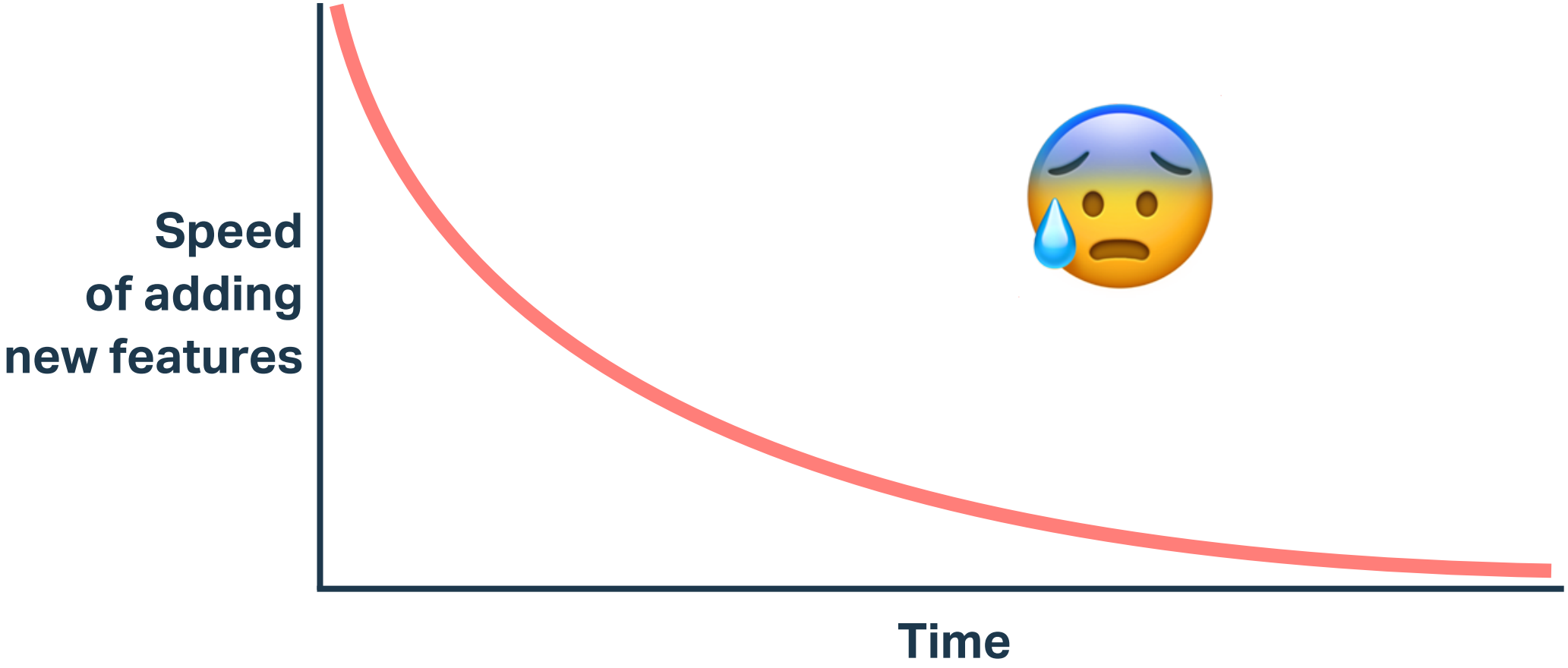
Code that negatively and repeatedly affects the speed or quality of delivery

Technical debt

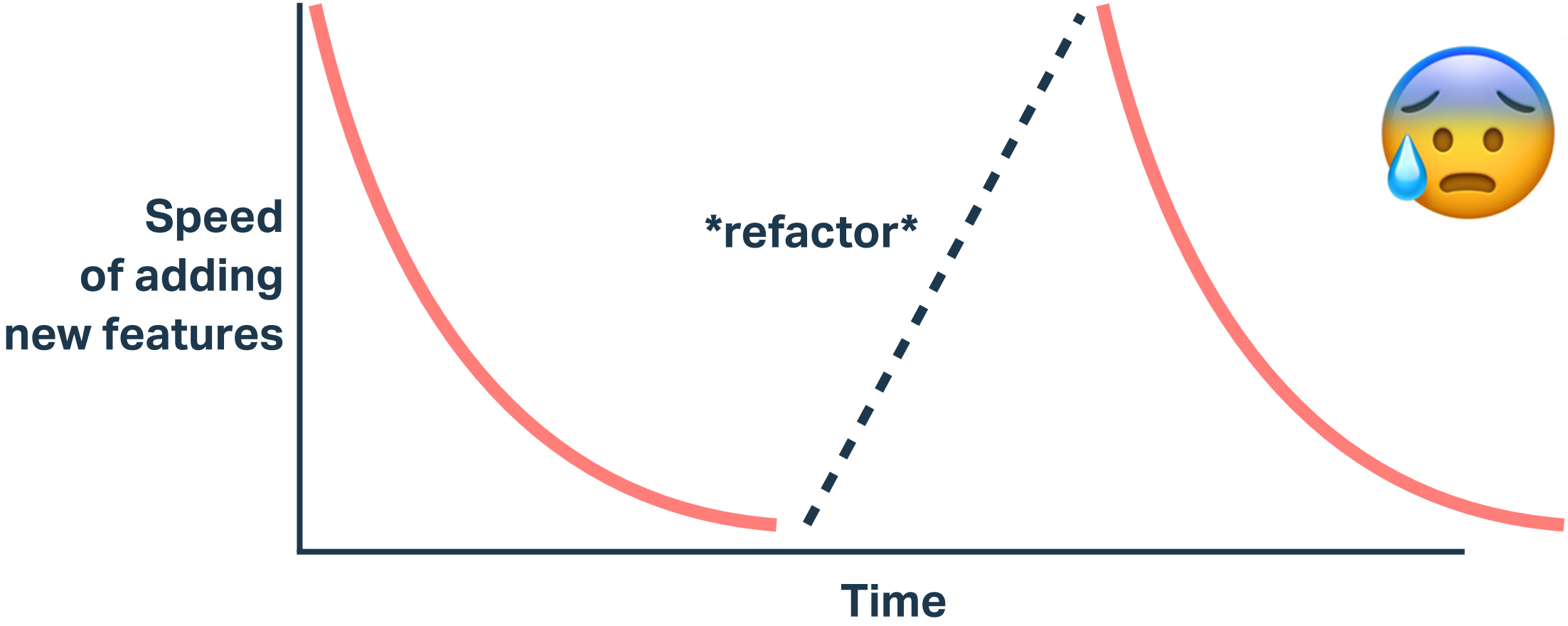
Code I wrote before I knew what I was doing?

Features that no one uses

Technical debt



Recurring technical debt



Second system effect

The tendency of small, elegant, and successful systems to be succeeded by over-engineered, bloated systems due to inflated expectations and overconfidence.

"The Mythical Man Month: Essays on Software Engineering" - Frederick P. Brooks Jr.

"Legacy code" often differs from its suggested alternative by actually **working and scaling**."

- Bjarne Stroustrup, Inventor of C++

Rewrite

Is this my destiny?

https://www.vectorstock.com/royalty-free-vector/ouroboros-snake-eating-its-own-tail-eternity-or-vector-12076546

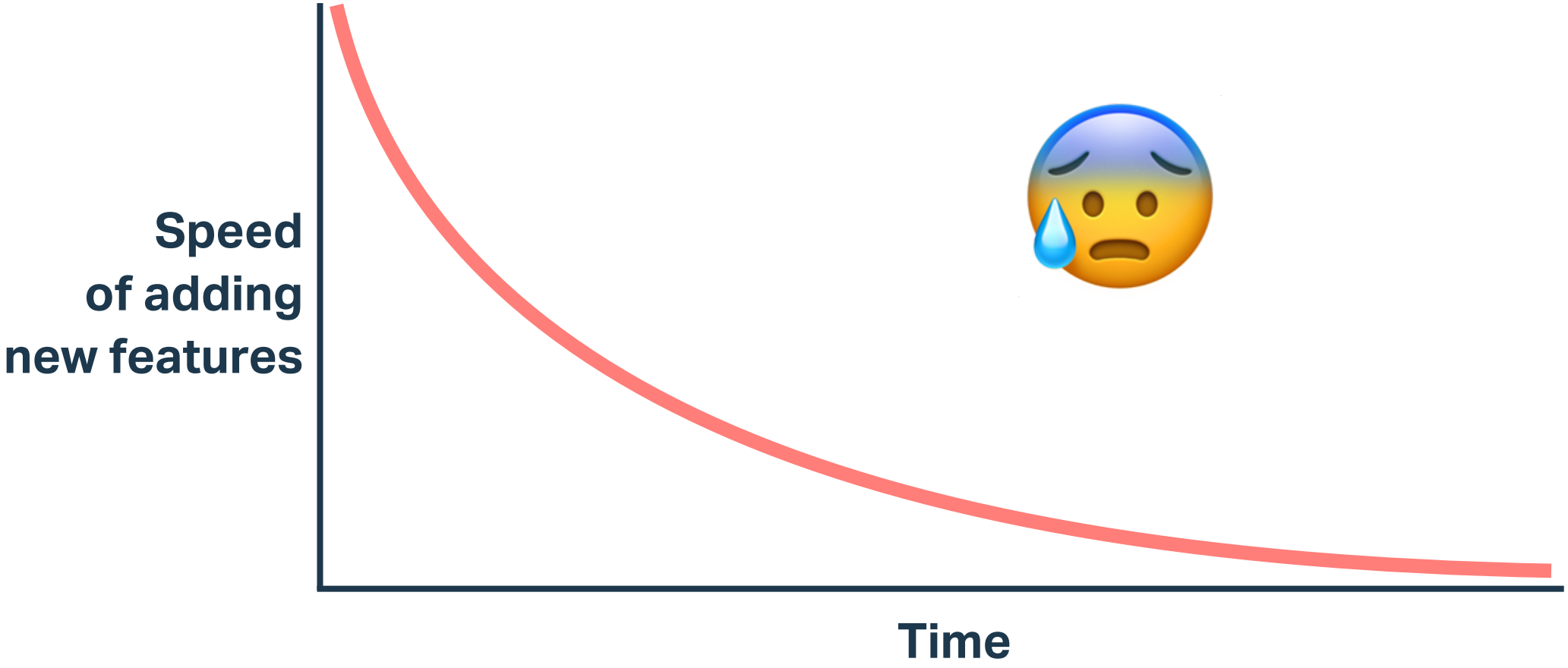
HARD FACT

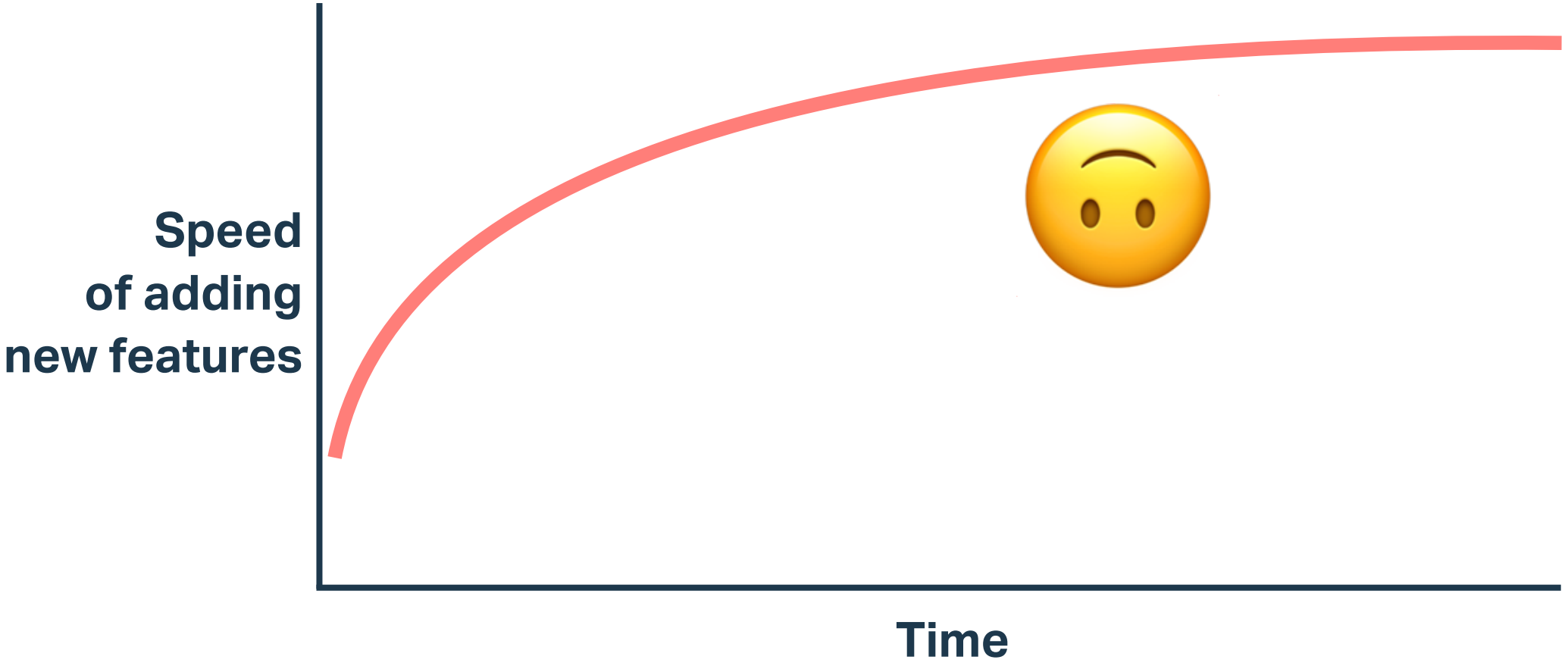
The **real cost** of software
is not the initial development,
but **maintenance over time**

THE QUESTION IS NOT

Why do we rewrite software?

How can we
make our systems
more resilient to
inevitable change
?


Speed
of adding
new features
Time


Speed
of adding
new features
Time

How do we reach this nirvana?

"Good architecture"

Hard to spell

Feels detached from daily problems

No clear definition

What does a software architect even do?

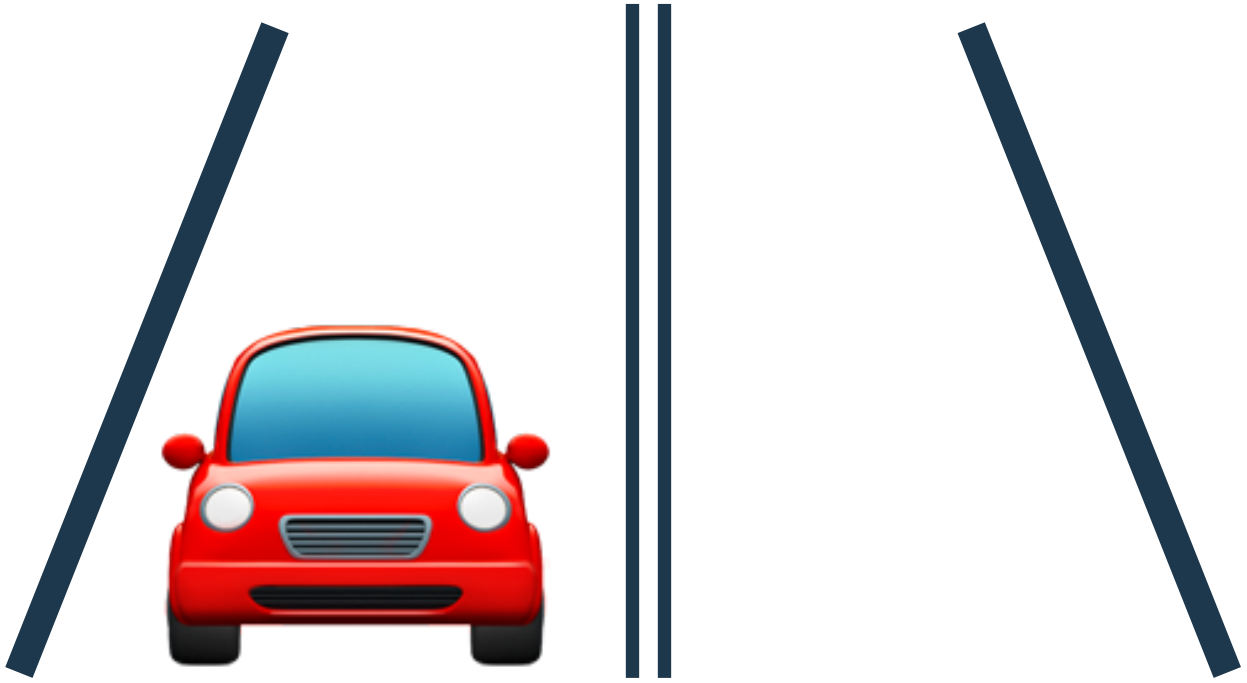
Sounds elite

"Architecture" has become a dirty word

Architecture as **enabling constraints**

Constraints about how we use data and code that help us move faster over time

Enabling constraints in real life



Enabling constraints in **Programming paradigms**

Paradigm	Constraint & Enablement
OOP	From function pointers to classes → **Independently deployable subcomponents**
Functional	From mutable to immutable data → **Eliminate race conditions and concurrency problems**

Enabling constraints in **Frontend development**

Paradigm	Constraint & Enablement
var → const	No more reassignment → **Predictable data**
jQuery → React	No more DOM manipulation → **Predictable UI**
CSS → CSS-in-JS	No more naming / side-effects → **Safety and fewer global clashes**

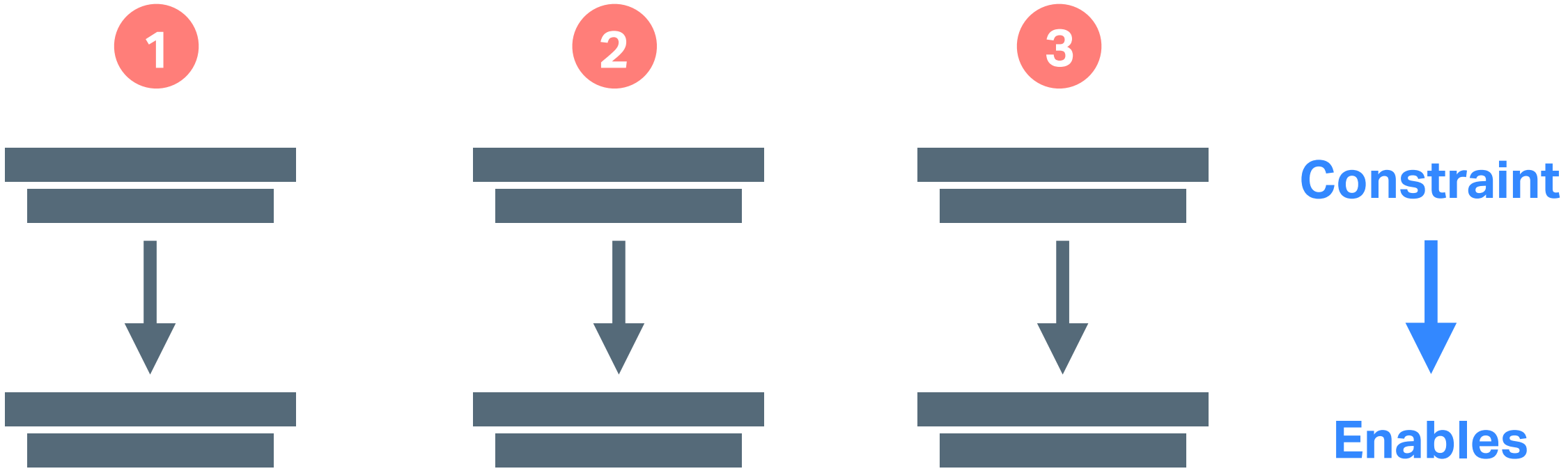
We are constraining ourselves **all the time**

We trade constraints for
safety and speed

NOT EXHAUSTIVE

3 constraints
you can use today
for more resilient frontend architecture

Constraints for more resilient frontend architecture

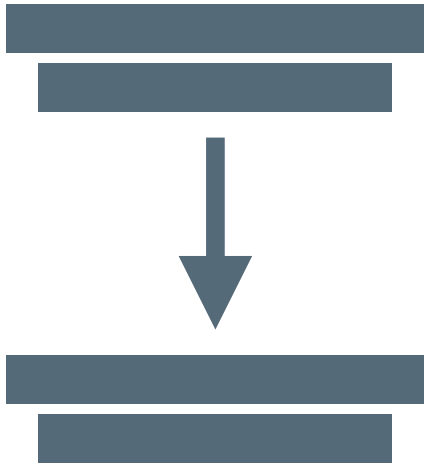


Constraints for more resilient frontend architecture

1

Source code dependencies must point inward

2



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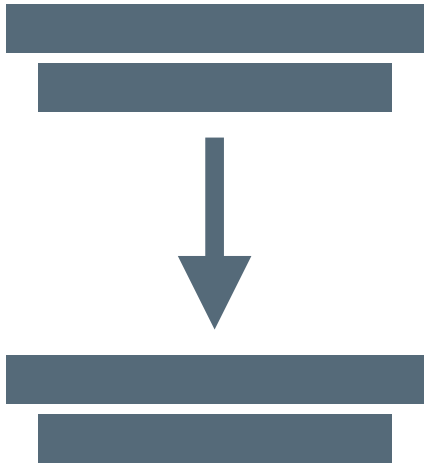
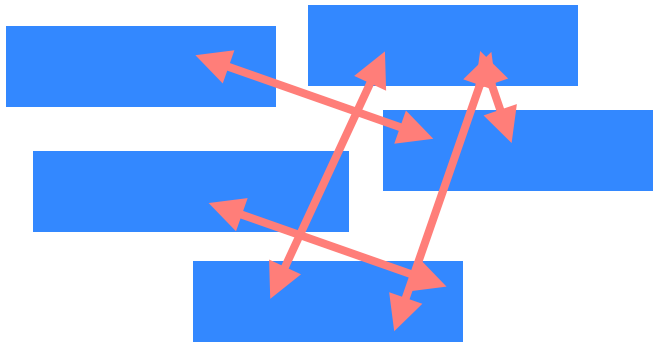


Constraint

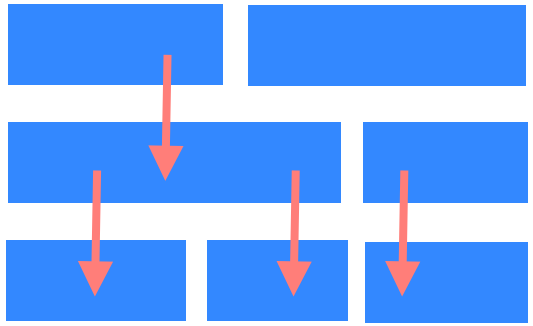
Enables

A few ways of organizing our dependencies

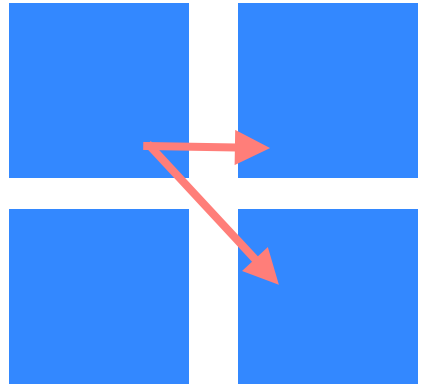
Big Ball of Mud



Layered



Modular

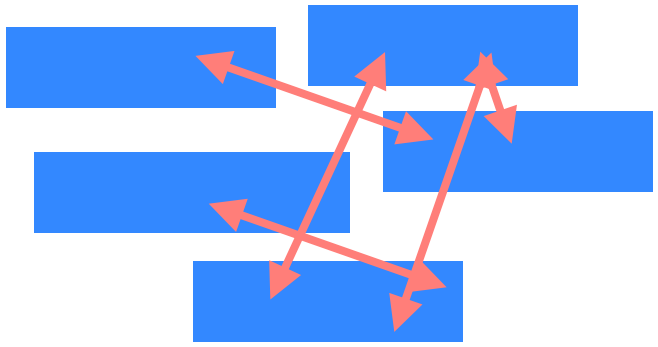


What's the difference?

Constraint

Source code dependencies must point inwards

Big Ball of Mud



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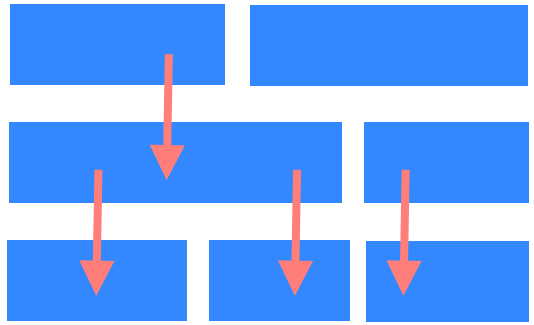
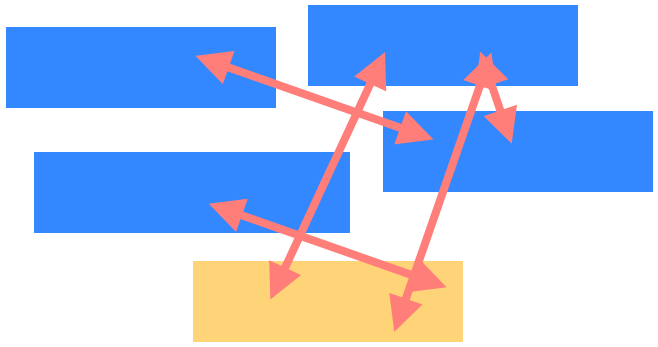


Constraint

Source code dependencies must point inwards

Big Ball of Mud



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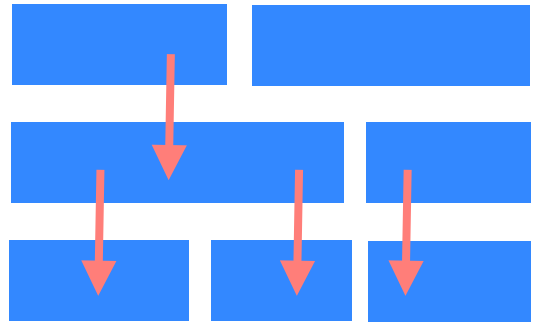
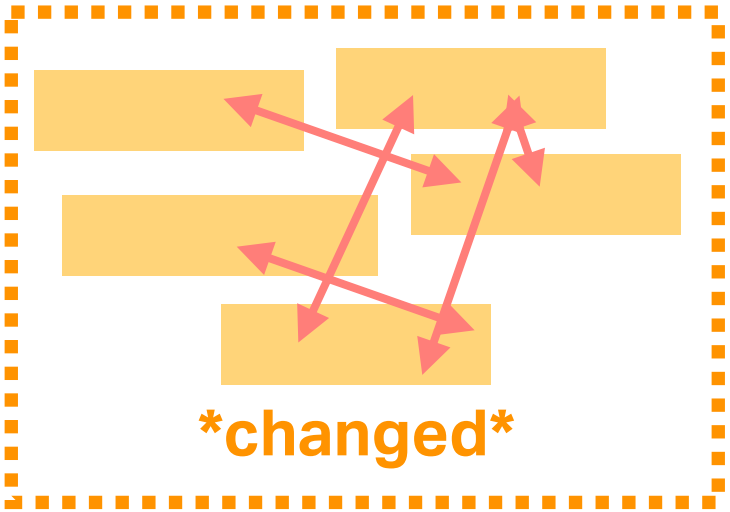


Huge or unknown regression scope
Cross-team conflicts

Constraint

Source code dependencies must point inwards

Big Ball of Mud



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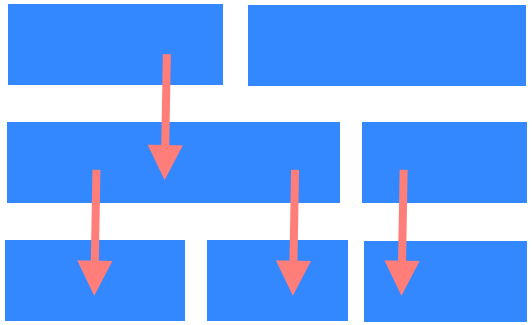
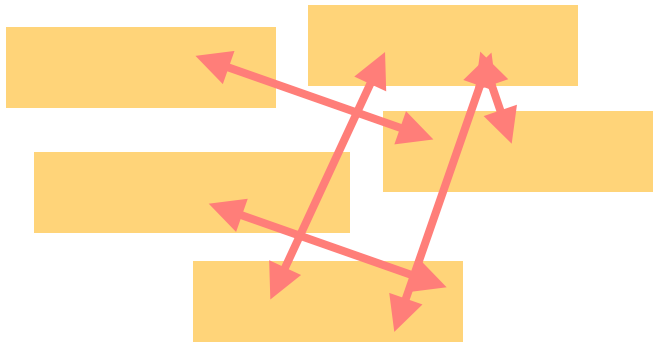


Constraint

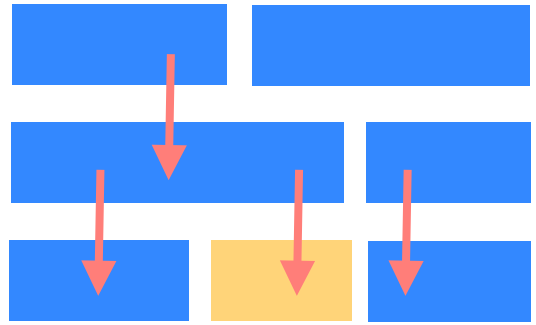
Source code dependencies must point inwards

Ball of Mud



changed

Layered



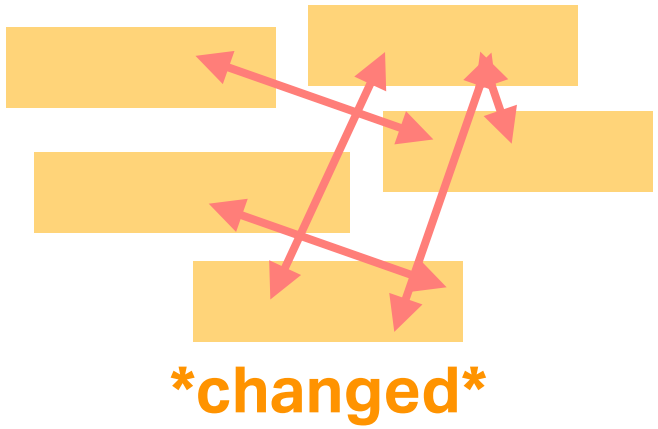
changed

Constraint

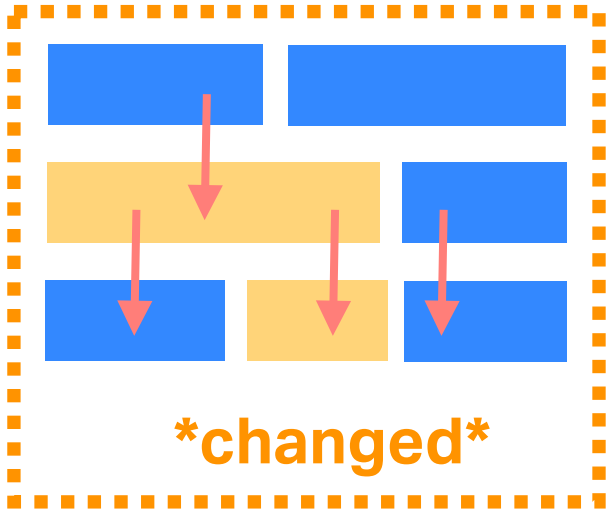
Source code dependencies must point inwards

Limited regression scope
(Usually) does not affect other teams

Ball of Mud



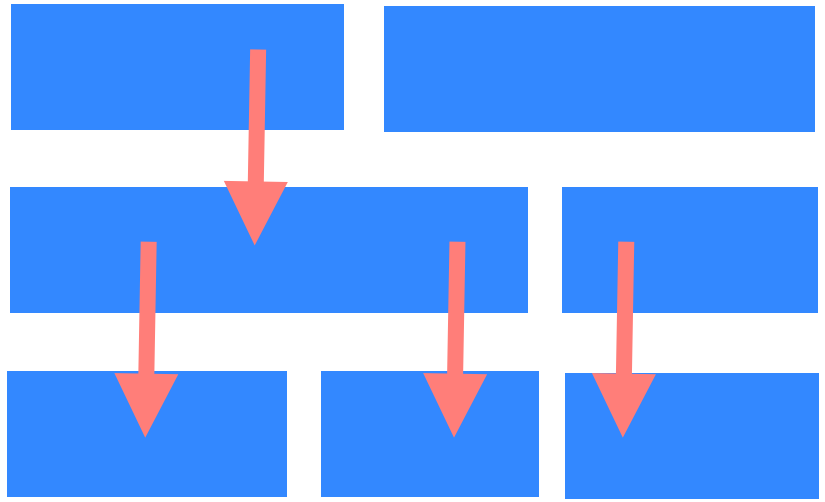
Layered



Key difference between a ball of mud and a well-organized monolith is **dependency organization**

Constraint

Source code dependencies must point inwards



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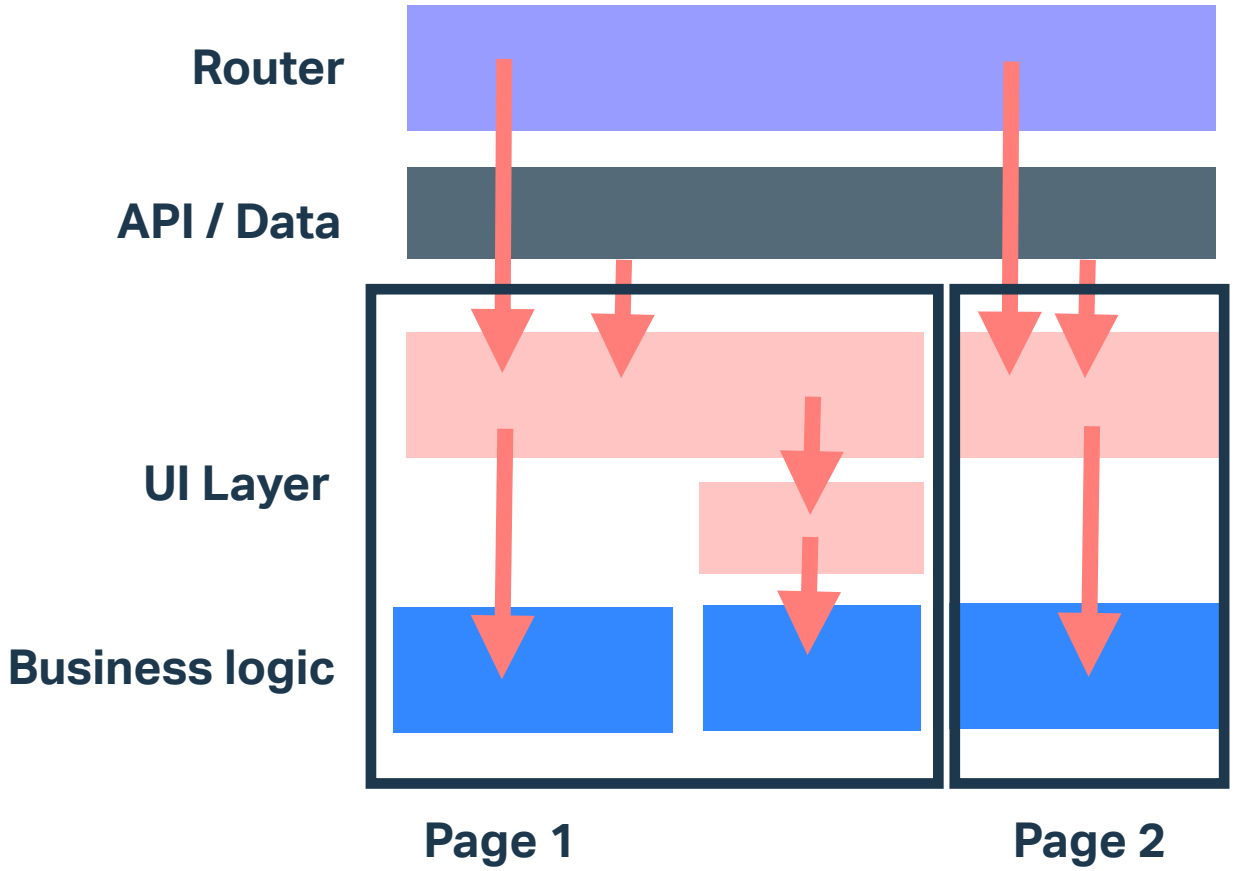


For each page,
the rest of the application
does not even exist

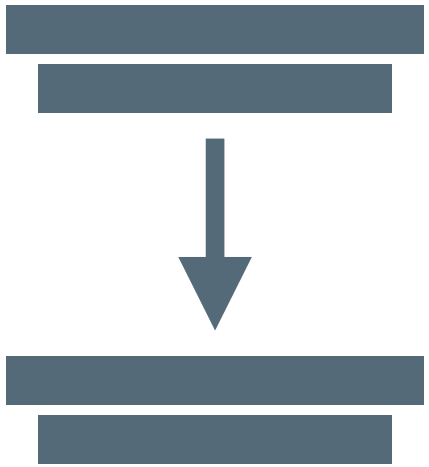
Constraints for more resilient frontend architecture

1

Source code dependencies must point inward

Easier to isolate impact of changes

2



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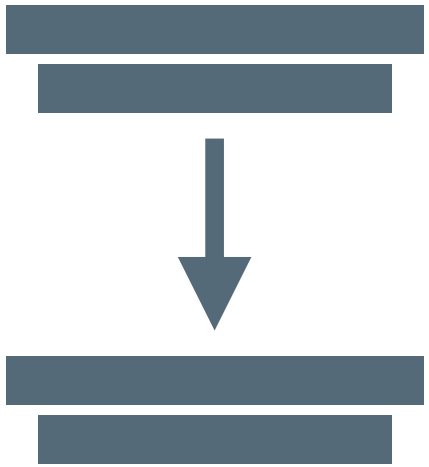


Constraint

Enables

What about **shared components**?

Design system 🎨 -or- copy-paste ✂️

Constraints for more resilient frontend architecture

1

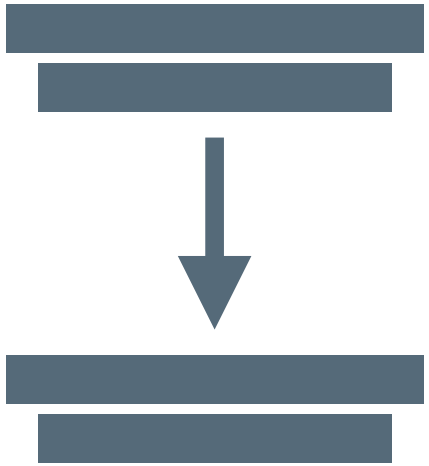
Source code dependencies must point inward

Easier to isolate impact of changes

2

Be conservative about code reuse

3



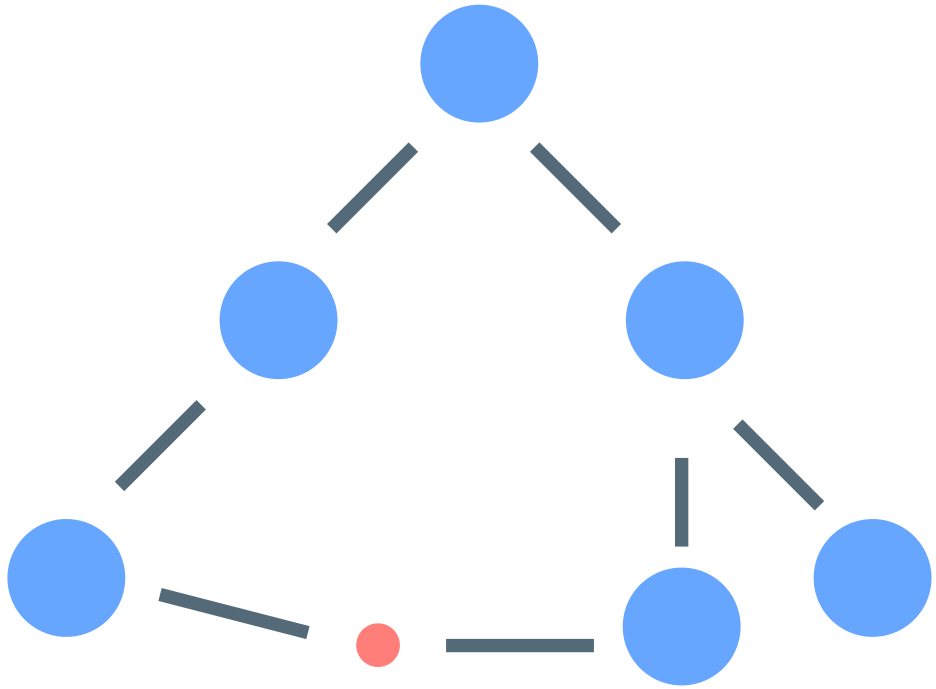
Constraint

Enables

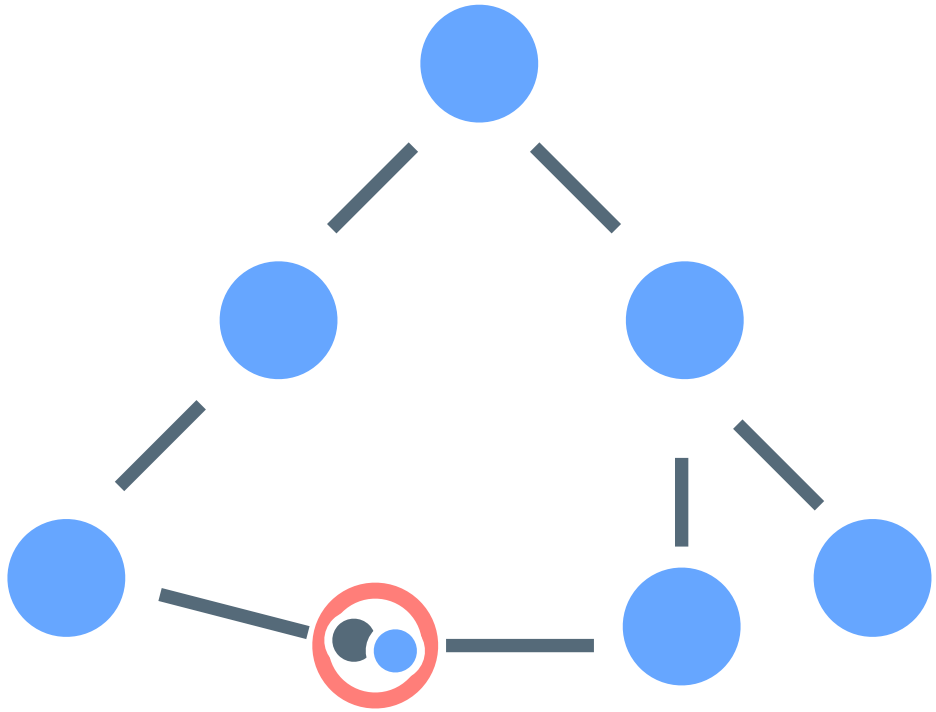
WE ❤️ DRY

The result is often **brittle** and
side-effect ridden code
in the name of **code reuse**

Impact of time on shared code



Impact of time on shared code



if, **context, branches…**

DECOUPLED > DRY

Code reuse is not a goal in and of itself

JBD
@rakyll

Following

A regular person sees it eith lf full or half empty.
An engineer th and learns in what kes sense to see it half full, ar en to see it half empty.

Sometimes you just need two glasses!

12:58 AM - 25 Jan 2019

Constraints for more resilient frontend architecture

1

Source code dependencies must point inward

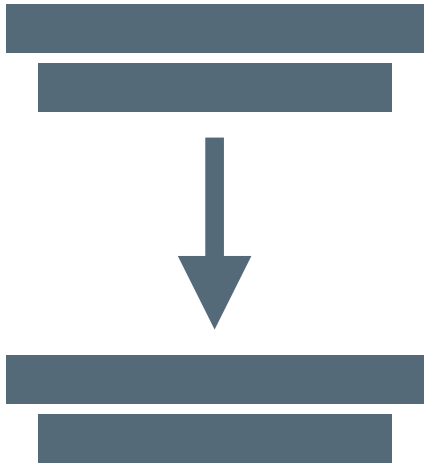
Easier to isolate impact of changes

2

Be conservative about code reuse

Avoid coupling code that diverges over time

3

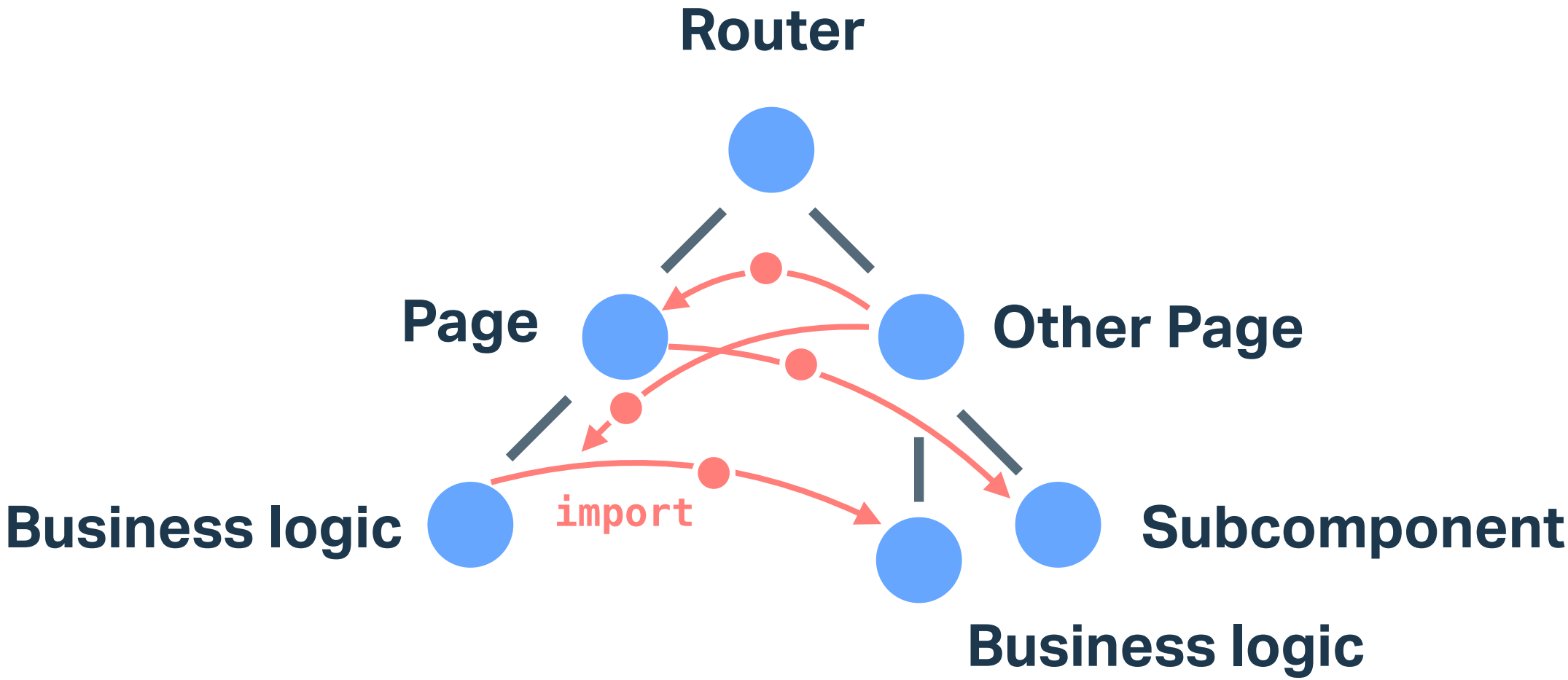


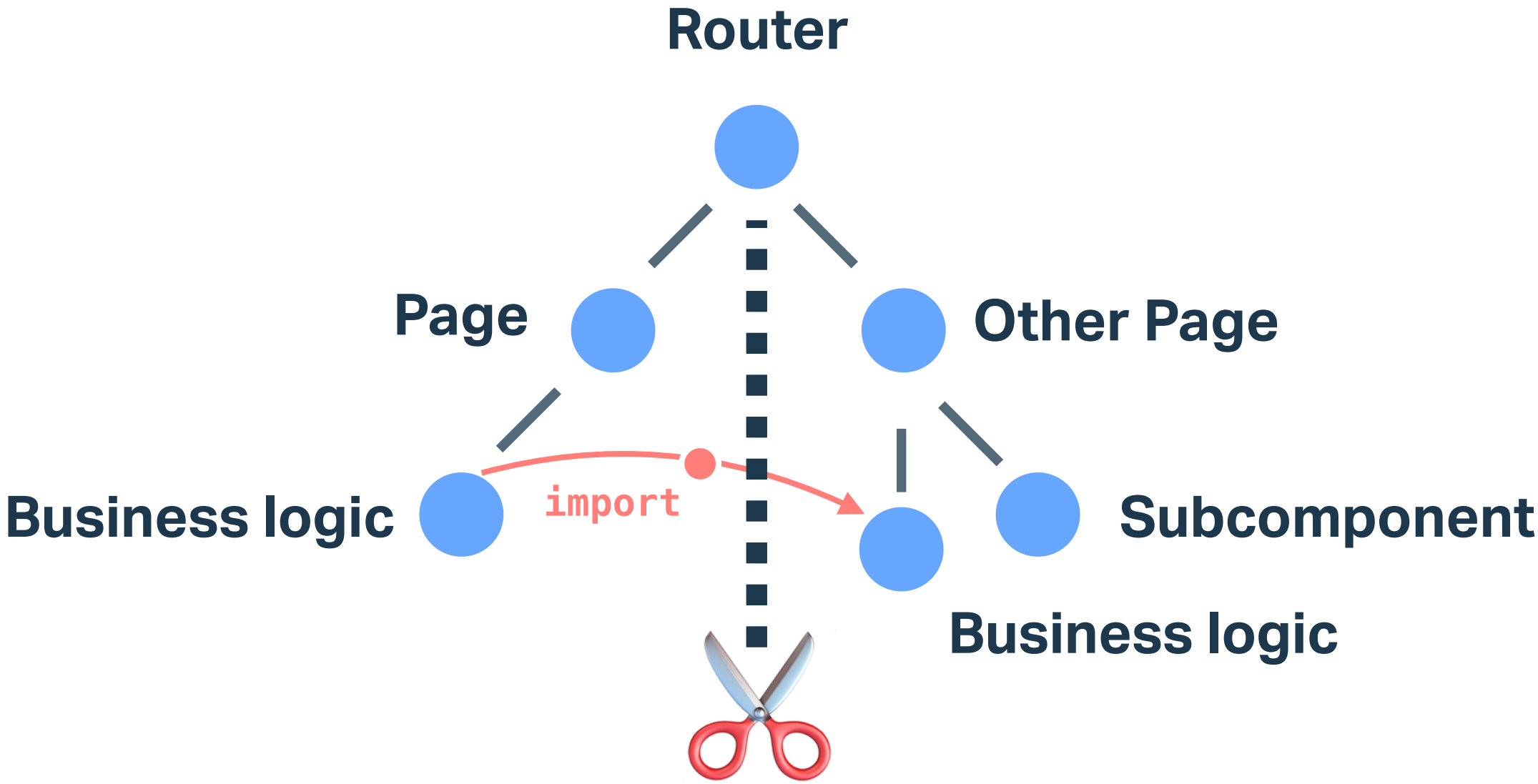
Constraint

Enables

Constraints for more resilient frontend architecture

1	2	3	Constraint
Source code dependencies must point inward	Be conservative about code reuse	Enforce your boundaries	
↓	↓	↓	↓
Easier to isolate impact of changes	Avoid coupling code that diverges over time		Enables


Router
Page
Other Page
Business logic
import
Subcomponent
Business logic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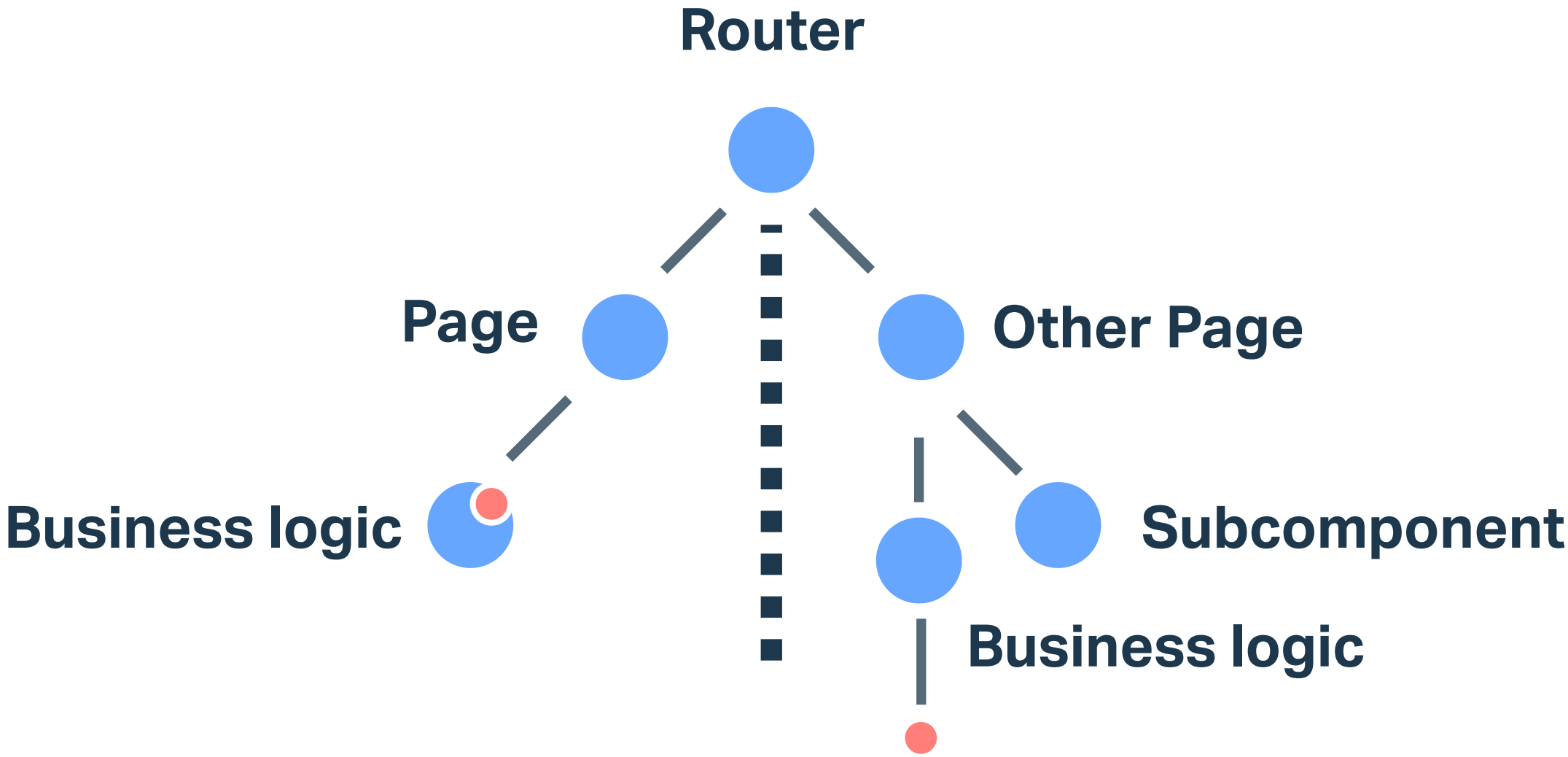
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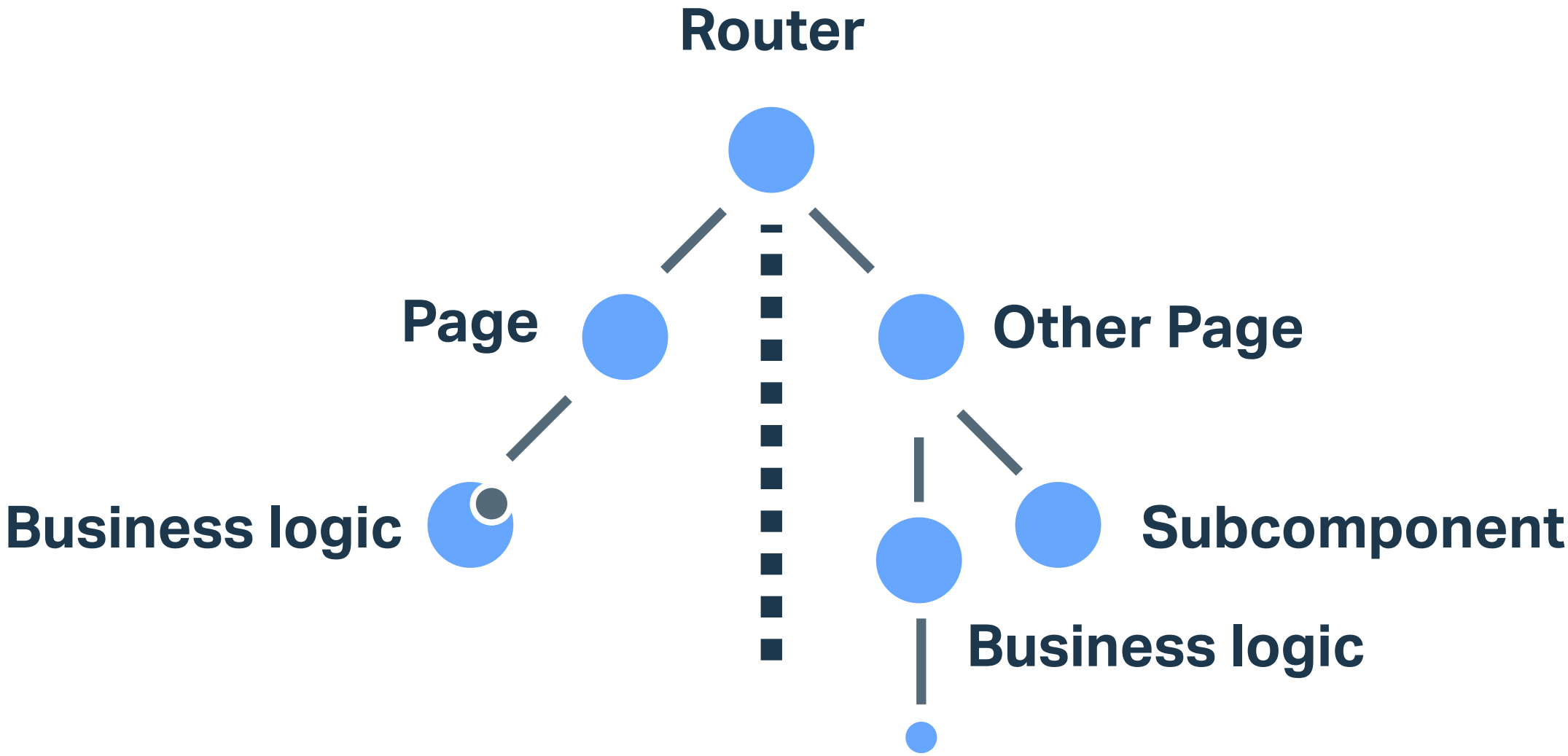
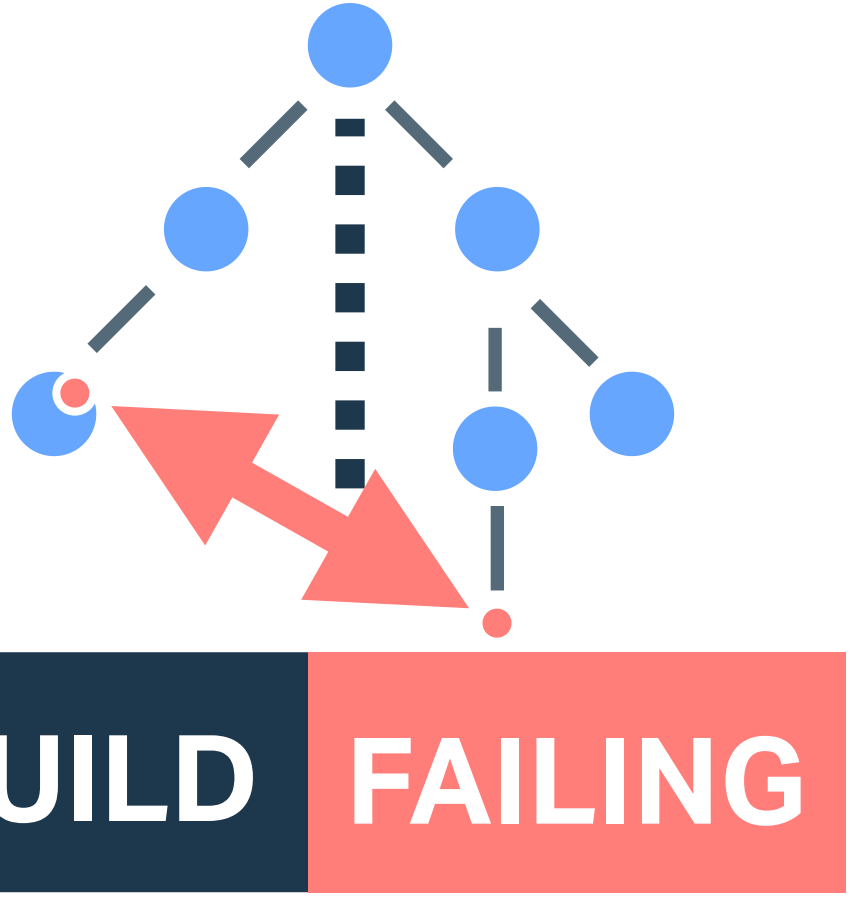

Router
Page
Other Page
Business logic
Subcomponent
Business logic

Forbidden dependency tests



Forbidden dependency tests

.dependency-cruiser.json

```
{
    "forbidden": [{
        "name": "Your Page",
        "comment": "Should not depend on other pages",
        "severity": "error",
        "from": { "pathNot": "^pages/YourPage" },
        "to": { "path": "^pages/YourPage" }
    }]
}
```

```
npm install --save-dev dependency-cruiser
```

Constraints for more resilient frontend architecture

1	2	3	
Source code dependencies must point inward	Be conservative about code reuse	Enforce your boundaries	Constraint
↓	↓	↓	↓
Easier to isolate impact of changes	Avoid coupling code that diverges over time	Preserve your architecture over time	Enables

The real cost of software
is **maintenance over time,**
because change is inevitable

What we've learned

Architecture is about
applying **enabling constraints**
to how we use code and data

We can make **small changes** to make our projects more resilient (1. Think **directionally**, 2. Be **conservative** on reuse, 3. **Enforce** our boundaries)

Every time you write a function (or don't), create a new module (or don't), you're making an **architecture decision**

You don’t have to derive architecture from **first principles**

👋

Thank you!

@monicalent

Please

Remember to rate this session

Thank you!

@GOTOber

gotober.com