

Divide and Conquer with Micro-frontends

- *Vishal Sharma*



Who am I?

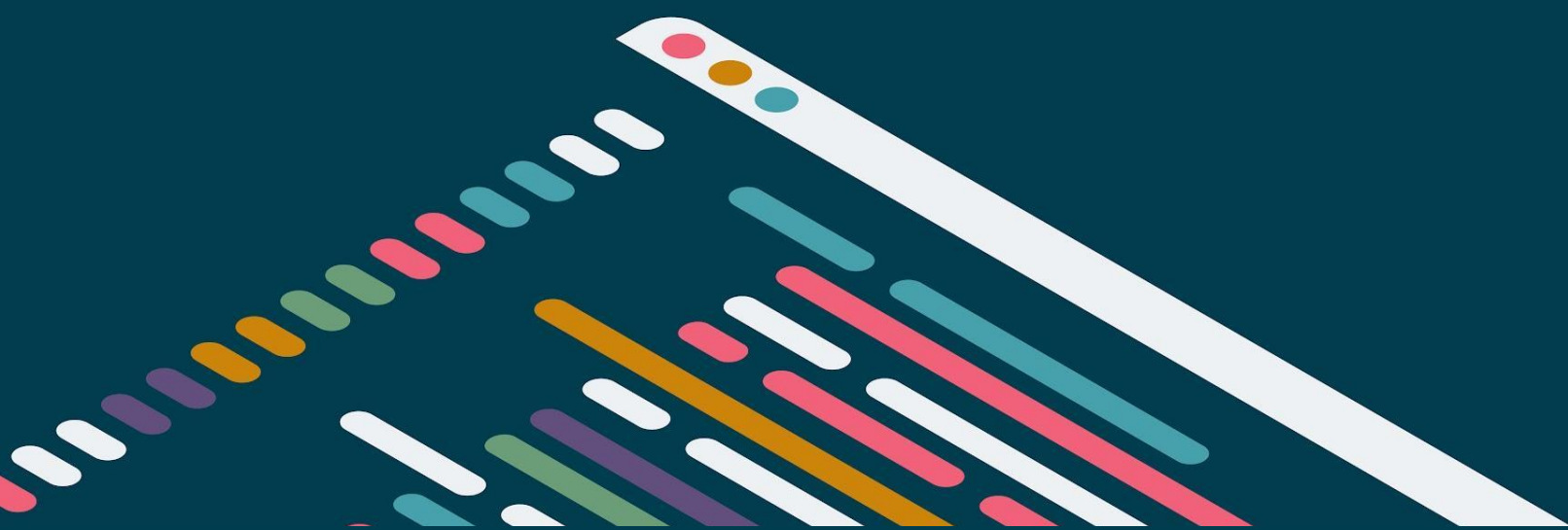
Vishal Sharma

Lead Consultant, Thoughtworks



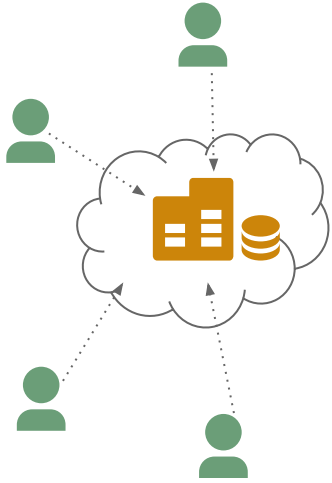
<https://www.linkedin.com/in/vishal-sharma-29749bb6/>

<https://medium.com/@sharvishi9118>

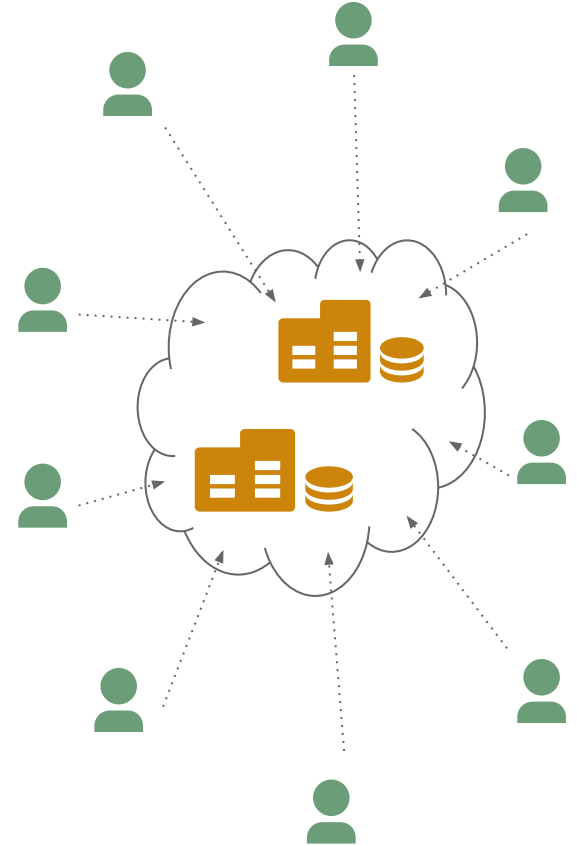


Why do we need Micro-frontends?

Scaling application



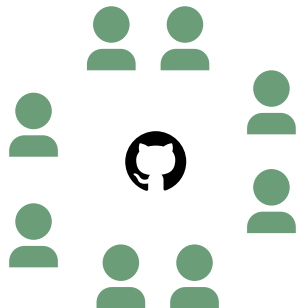
- Increased performance
- Reduced Latency
- Managing high volumes



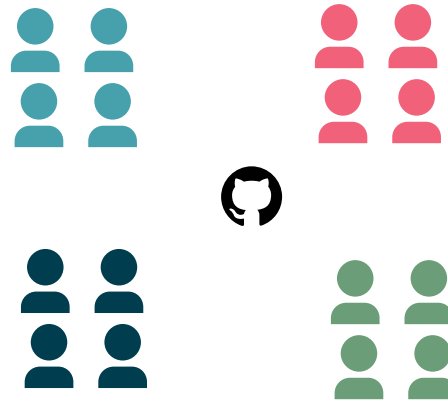
Scaling application teams



Vertical scaling of teams



Horizontal team scaling



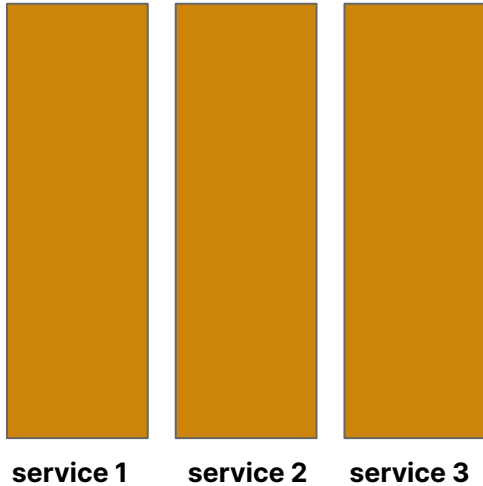
Microservices for the backends and Micro-frontends for the frontend

Monoliths



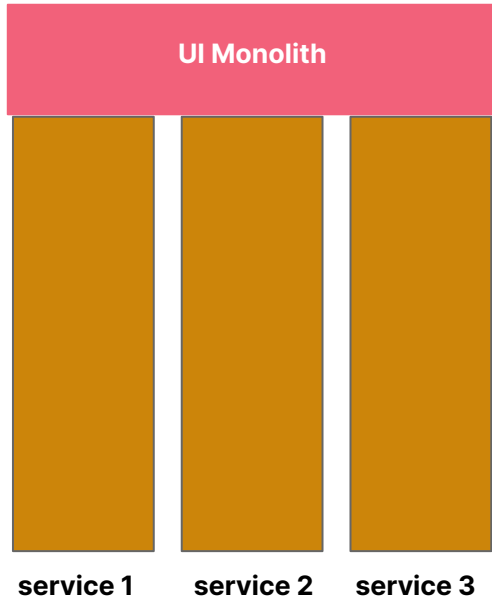
Monoliths aren't a bad
design choice

Microservices



- Strong module boundaries
- Independant deployments
- Diversified Technologies

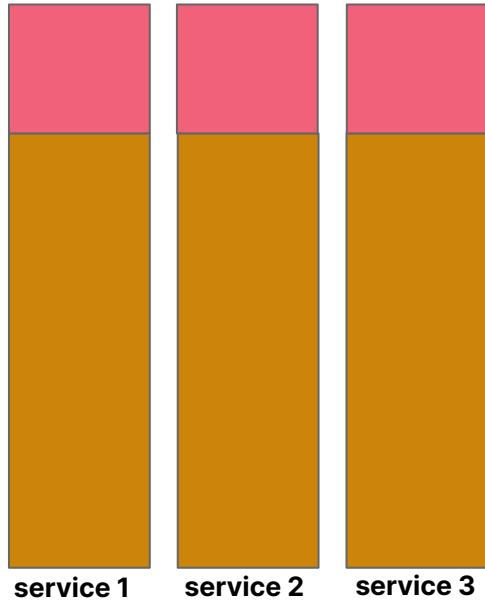
MicroServices + UI Monolith



There was mostly a monolith UI, which made independent deployments less true.

Independent deployments aren't independent releases.

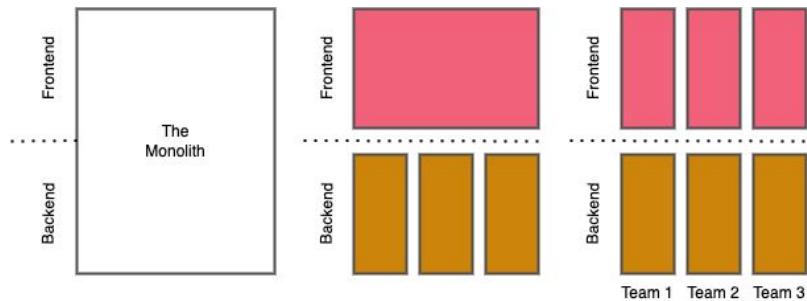
Micro-frontends



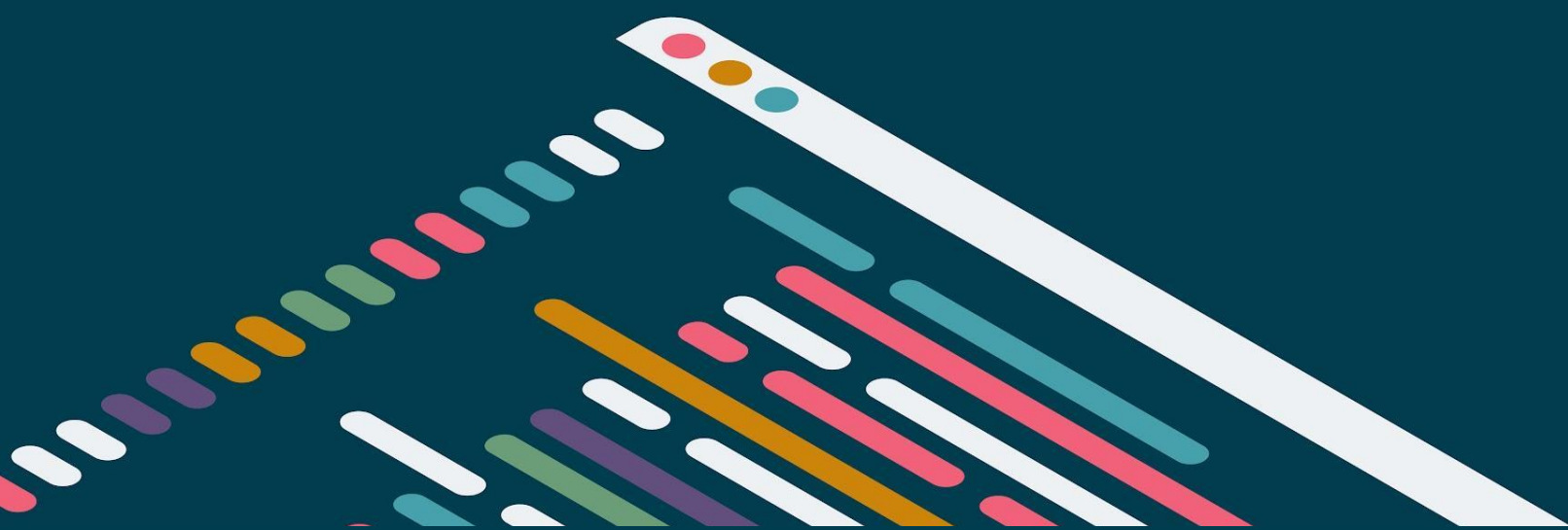
Micro frontends is an architectural design pattern to break down monolith UI to a smaller and manageable deployable units.

Microservices' promises +
Independent releases.

What you get from Micro-frontends



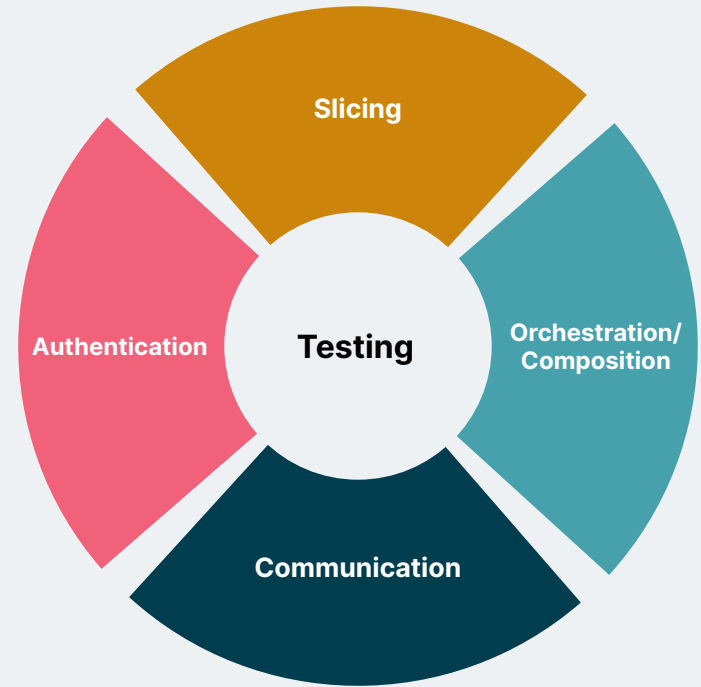
- Independent teams
- Independent releases
- Simple, decoupled codebases
- Incremental upgrades



Key decisions when starting Micro-frontends

Key Questions that need to be answered

1. **Slice:** How to break an application to separate pieces
2. **Composition:** How do multiple micro-frontends come together to form a single application.
3. **Communication:** How to communicate between micro-frontends
4. **Authentication:** How different MFEs can get authenticated
5. **Testing:** How should we test the micro-frontends



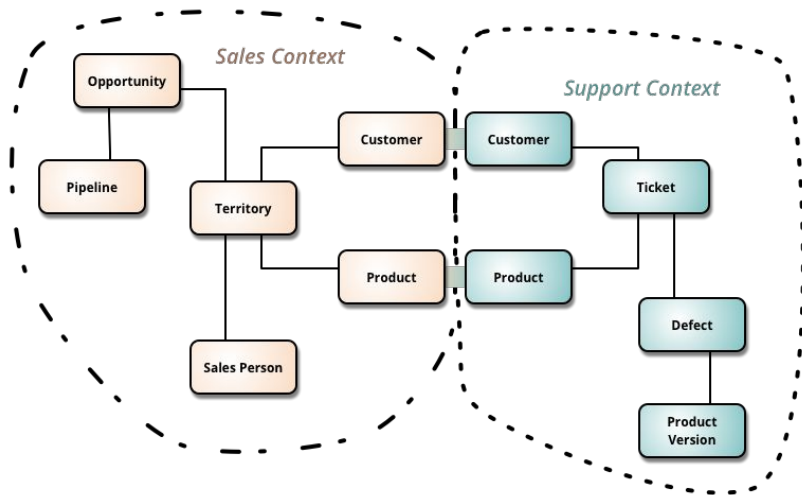
Slicing the Micro-frontends

- Don't start thinking it as components.
- Page level vs Cross sectional
- Case by case, create a framework to ideate and slice.

Bounded Context Pattern

“Total unification of the domain model for a large system will not be feasible or cost-effective”

- Eric Evans (DDD)



Bounded Context

Example:

Product Detail Page

Image carousel



Bose QuietComfort 35 II Noise Cancelling Bluetooth Wireless Over Ear Headphones With Mic And Alexa Voice Control (Black)

Visit the Bose Store
★★★★★ 58,272 ratings | 428 answered questions

M.R.P.: ₹29,363.00
Deal Price: ₹21,999.00
You Save: ₹7,364.00 (25%)
Inclusive of all taxes

Colour: **Black**

₹21,999.00

₹21,999.00

...

Brand Bose
Colour Black
Connector Type Wireless, Wired
Model Name 35 II
Form Factor Over Ear

Lightning Deal
₹21,999.00 (Save 25%)

19% Claimed
Ends in 06h 41m 43s

FREE delivery: Monday, April 25
Details

Fastest delivery: Tomorrow
Order within 6 hrs and 58 mins
Details

Select delivery location

Quantity: 1

Add to Cart

Regular Price
₹29,363.00
FREE delivery: Monday, April 25
Shop from Amazon
Sold by: Appario Retail Private Ltd

Page 1 of 38

Product Summary

Pricing & Promotion

Recommendations

Products related to this item

Sponsored



Product Information

Technical Details

Brand	Bose
Manufacturer	BOSE CORPORATION INDIA PRIVATE LIMITED, Tower B, 4th Floor, N-10, DLF Cyber City, DLF Phase 2, Gurugram, Haryana 122019
Model	789564-0010
Model Name	35 II
Model Year	2017
Product Dimensions	8.13 x 17.22 x 18.03 cm; 235.87 Grams
Batteries	1 LR44 batteries required. (included)
Item model number	789564-0010
Hardware Platform	Smartphone

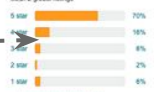
Additional Information

ASIN	B07N6C9WWD
Customer Reviews	★★★★★ 58,272 ratings 4.4 out of 5 stars
Best Sellers Rank	#4,714 in Electronics (See Top 100 in Electronics) #41 in Over-Ear Headphones
Date First Available	9 October 2017
Packer	Bose Corporation India Pvt. Ltd, Tower B, 4th Floor, N-10, DLF Cyber City, DLF Phase 2, Gurugram, Haryana 122019
Importer	Bose Corporation India Pvt. Ltd, Tower B, 4th Floor, N-10, DLF Cyber City, DLF Phase 2, Gurugram, Haryana 122019

Customer reviews

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58,272 global ratings



How are ratings calculated?

By feature

Battery life	★★★★★ 4.6
Durability	★★★★★ 4.5
Comfort	★★★★★ 4.5
See more	

Ratings

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Customer Reviews

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Starry with 1000014
Industry leading Noise Cancellation Bluetooth Wireless Over Ear Head...
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New Bose QuietComfort
45 Noise Cancelling Headphones - Triple Black
₹32,900.00

Bose Noise Cancelling
700 Bluetooth Wireless Over Ear Headphones with Mic for Call...
₹34,500.00

Pure Tone Ear Cushions for
Bose QC35 - Silver Shell
₹1,099.00

Bose Noise Cancelling
700 Bluetooth Wireless Over Ear Headphones with 100% Signature Sound...
₹1,499.00

BOSE QuietComfort
45 Noise Cancelling Earbuds for Bose...
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5 star 70%
4 star 16%
3 star 8%
2 star 2%
1 star 4%

How are ratings calculated?

By feature

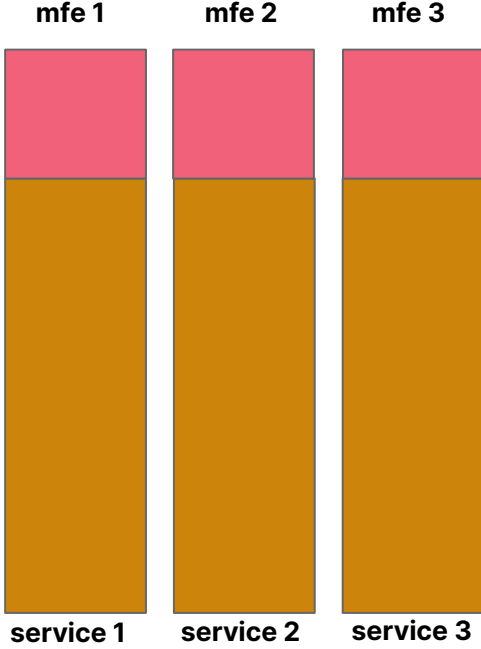
Battery life ★★★★★ 4.6
Durability ★★★★★ 4.5
Comfort ★★★★★ 4.5
See more

version shikha
★★★★★ Read this before buying
Reviewed in India on 27 October 2018
Colour: Black Verified Purchase
Things I already knew:
- These are not bass-centric
- Noise cancellation does not block all sounds, but blocks most.
- Things I did not know:
- Sound distorts at max volume
- There's a crackling noise every now and then
You can do a google search to see that they are known issues and many users are facing these. The above 2 points were unacceptable in a 30000+ bucks headphone. I got these for 20k during the sale but still unacceptable. It was so shocking to me that I went to a bose store to check as if they are genuine or not by to demo a pair to see if the issues exist in the demo pair as well. They were genuine and the same issues existed in the demo pair as well.
Thank you so much Amazon for the quick delivery and for processing the return. I would have been stuck with these if I would have bought them elsewhere. Anyone who has them and says these issues do not exist is either deaf or too proud to accept that he/she has been dupped by bose.
1,134 people found this helpful

Helpful Report abuse

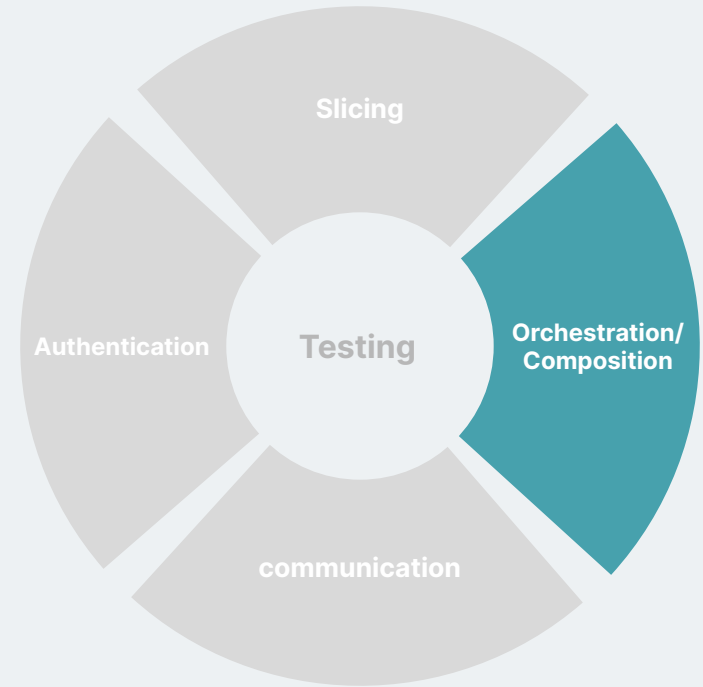
Customer Reviews

Sub domain teams

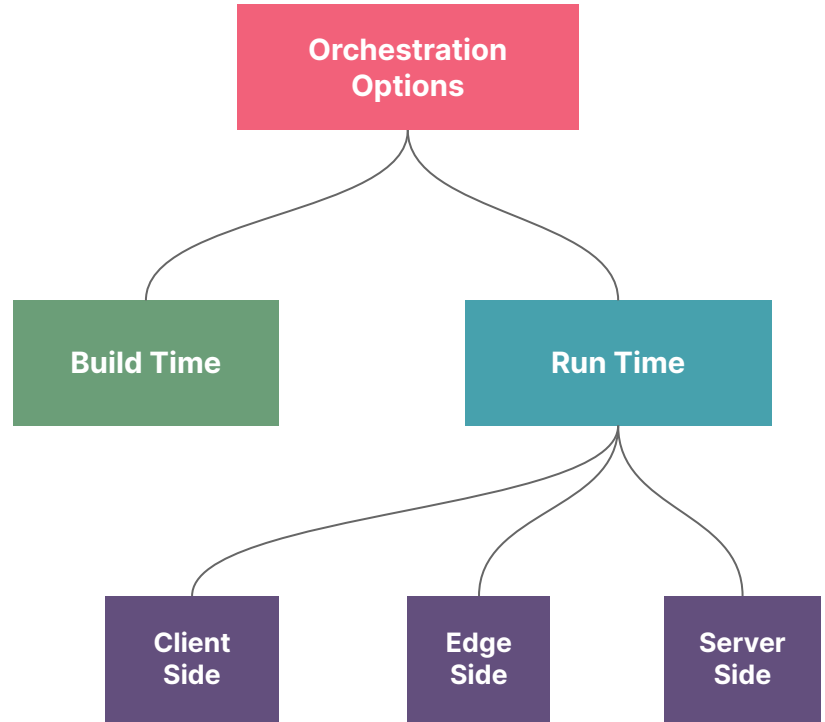


Key Questions that need to be answered

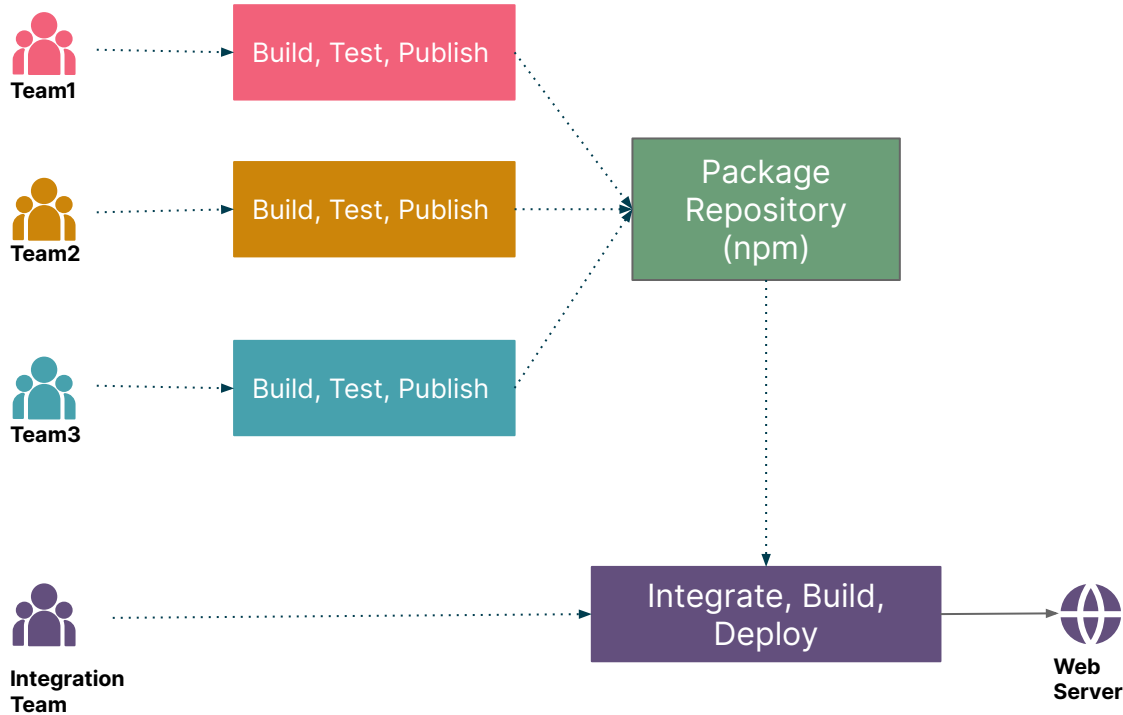
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Orchestrating Micro-frontends



Build time composition



aka

“Distributed Monolith”*

** - use it with extreme caution,
can become worse than a
monolith*

Run time composition

Different micro-frontends gets unified dynamically into a single page (or view) based on the user's request.

1.

**Client Side
Composition**

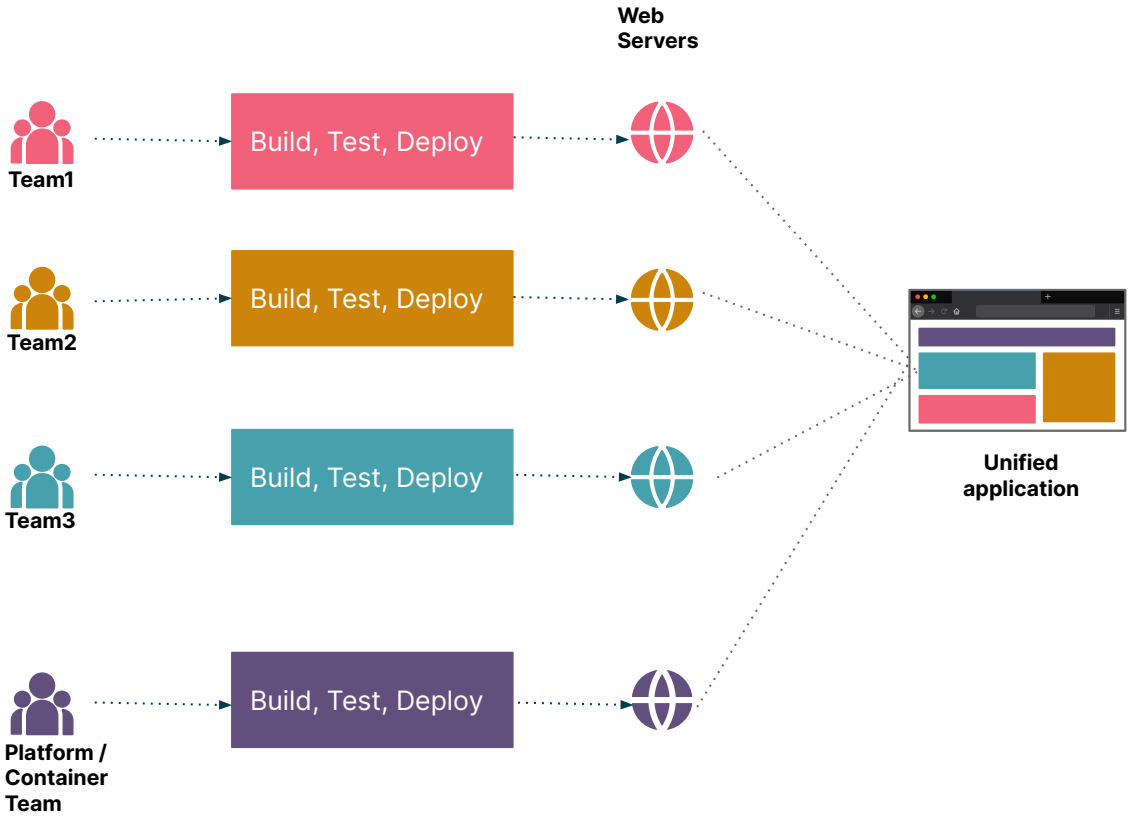
2.

**Edge Side
Composition**

3.

**Server Side
Composition**

Client Side Composition

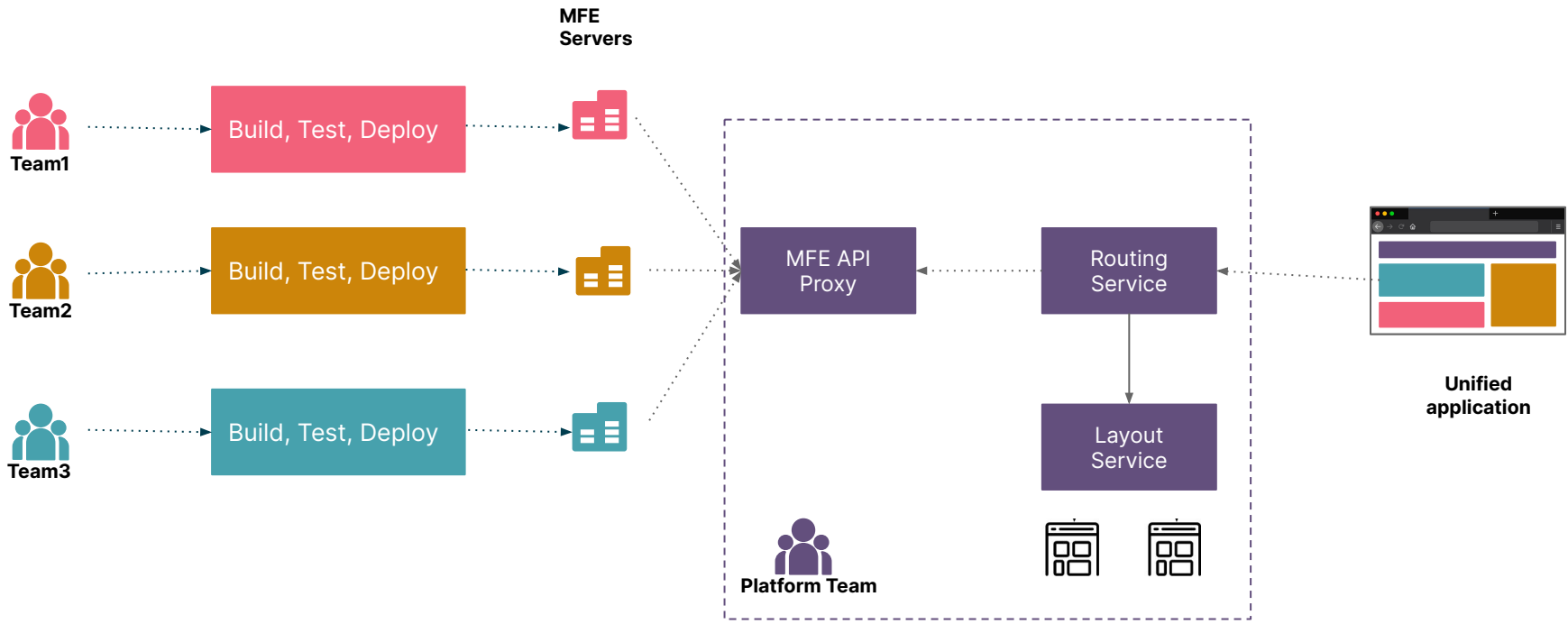


Client Side Composition - Options

- Iframe based integration - luigi-project.io
- Webpack plugins - module-federation-plugin
- SingleSpa Framework - single-spa.js.org
- Client side transclusions - [h-include](#)
- Or Write your 20 lines of JS :)



Server Side Composition

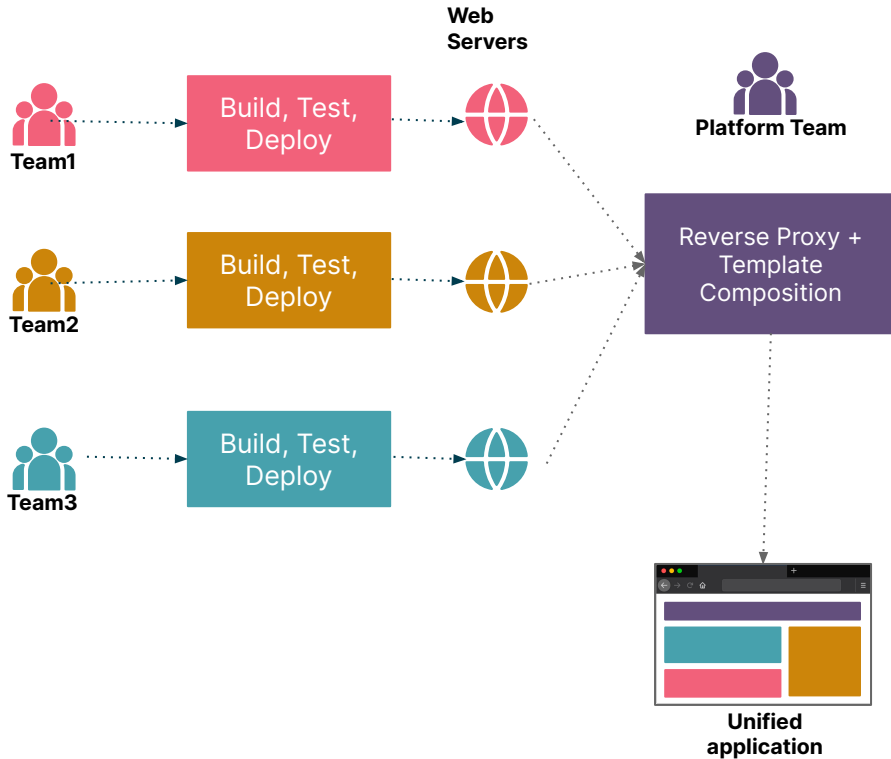


Server Side Composition - Options

- Ara Framework - [ara-github](#)
- Tailor - [project-mosaic](#)
- Hypernova - [airbnb-hypernova](#)
- Open components - [open-components](#)
- Piral - [piral.io](#)
- Podium - [podium-lib](#)



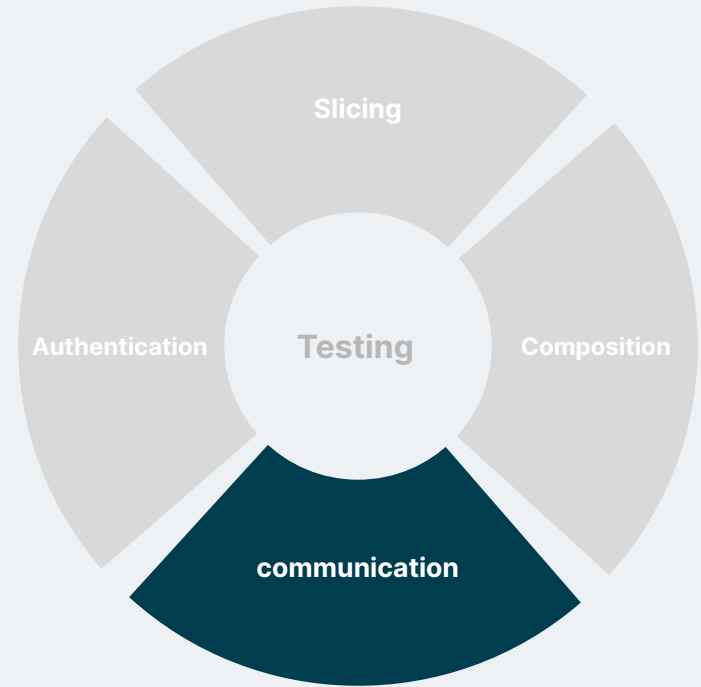
Edge Side Composition



```
<html>
  <head/>
  <body>
    <div id="content">
      <div id="header">
        
        **<esi:include src="/shopping_cart" />**
      </div>
      <div id="items"/>
    </div>
  </body>
</html>
```

Key Questions that need to be answered

1. **Slice:** How to break an application to separate pieces
2. **Compose:** How to build a page / functionality using different pieces
3. **Communication:** How do the micro-frontends communicate with each other.
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Micro-frontends communication

Storage based

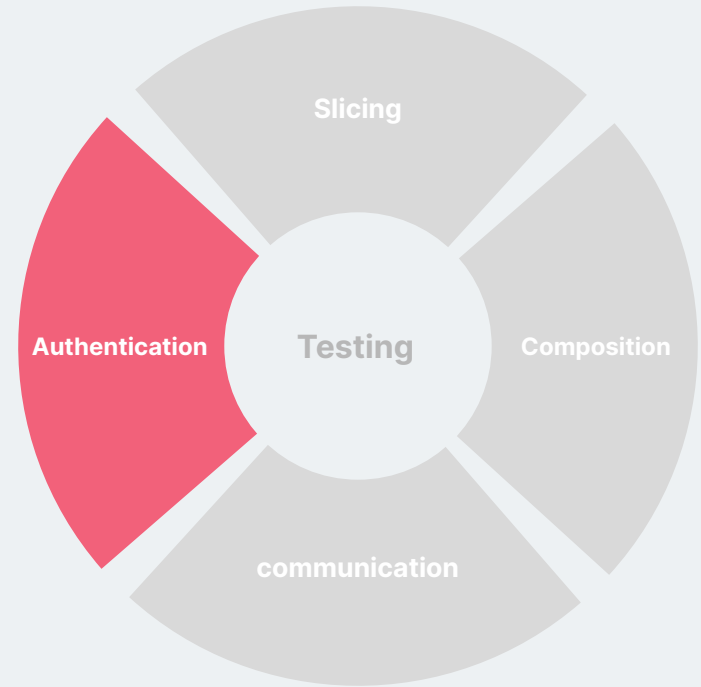
Using a global context or window objects it's possible to communicate with Micro-frontends

Event based

Using JS eventing we can communicate across Micro-frontends.

Key Questions that need to be answered

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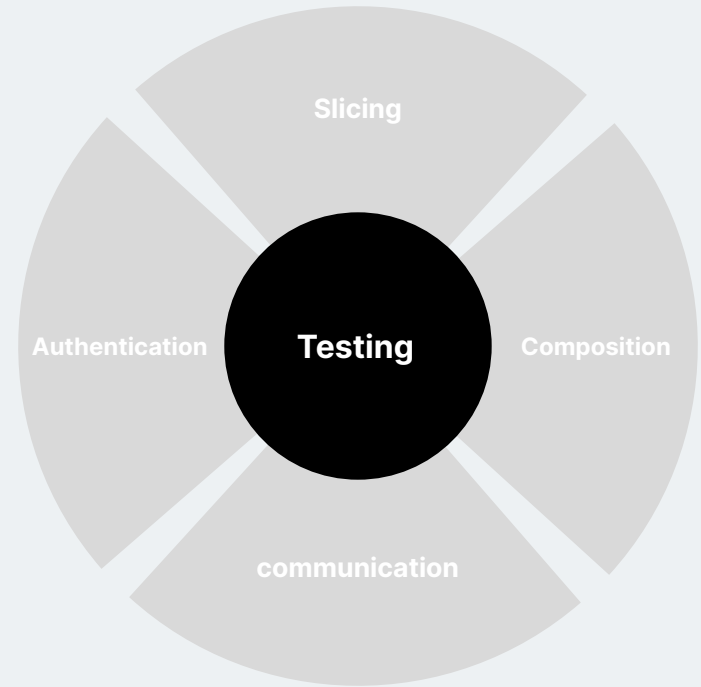


Authenticating the Micro-frontends

- How will each authenticated micro frontend run independently

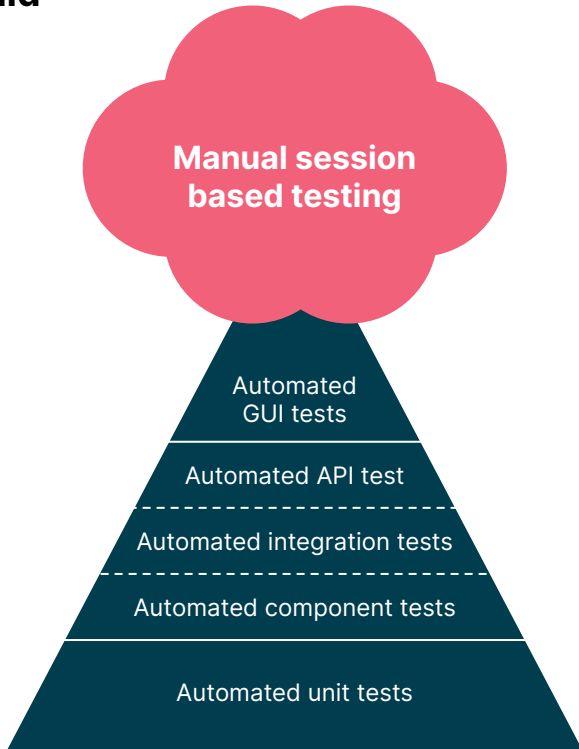
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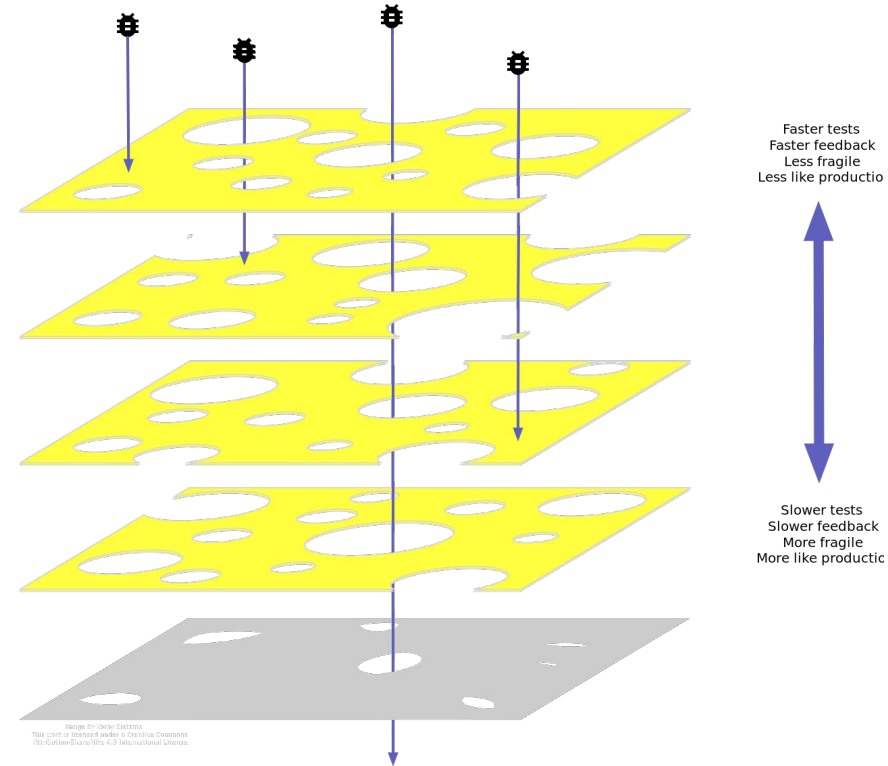


Testing Strategies

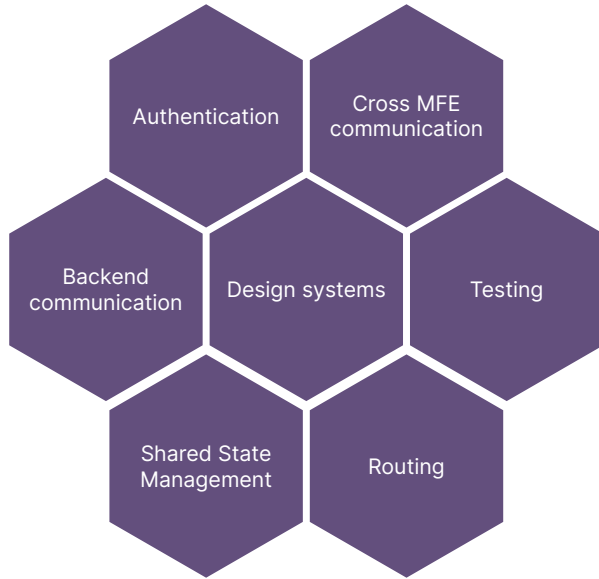
Pyramid



Swiss Cheese - [Korny's Blog](#)



Technical aspects as per your choice of integration approach



Team formation

- Team structure and software structure should align
- Follow domain driven design. “bounded context” principles
- Vertical team structure: One team, one application/MFE
- Build a cross functional team

Program level

 Architects, Leads, Product Owners

 Business Analysts

 Quality Analysts

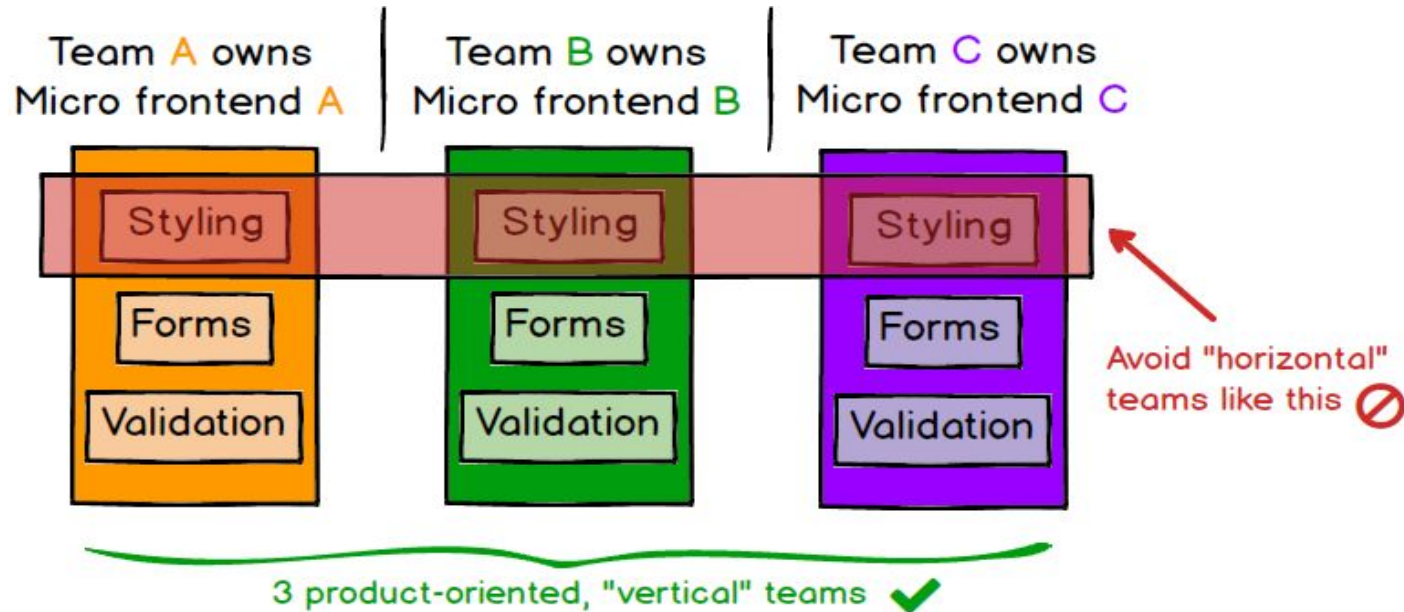
Team level

 Team Leads, Product owners

 Developers, Business Analysts

 Quality Analysts

Independent Deployment is possible only using vertical teams



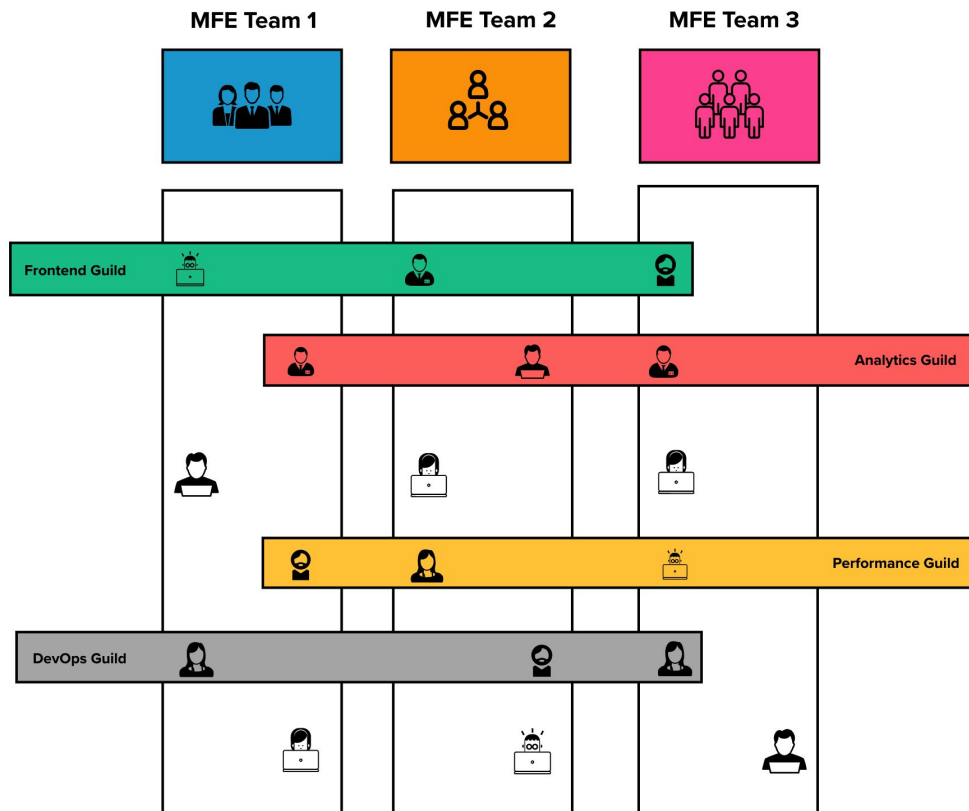
Shared guidelines

- All teams should speak the same vocabulary
- Agree on terms of responsibility and ownership
- Should adhere to global agreements and conventions
- Maintaining ADRs and documentation
- Maintain a global project scaffolding (but make it optional)



Team guilds

Forum for like minded people from different teams to share and discuss





To micro-frontend or not ?

Decision making factors for MFEs

It takes relatively longer time to:

- Provision and setup MFE Infrastructure
- Set up MFE codebases with shared dependencies
- Set cadence, workflow between teams, setup guilds
- Time and cost



Decision making factors for MFEs

Practical factors to consider:

- Project scale and timeline fairly large
- There is clear separation of sub domains
- Team size and distribution
- Migrating from a monolith



Alternate approach

You may not need to start with an MFE from day 1

1.

**Start with a
monolith**

2.

**Keep clear
separation between
sub domains for
easy separation**

3.

**Slowly migrate to
MFE architecture**



**Micro-frontends is a
marathon. Not a sprint**

References

<https://martinfowler.com/articles/micro-frontends.html>

<https://www.thoughtworks.com/en-in/about-us/events/webinars/microfrontend>

<https://www.youtube.com/watch?v=iZ-wlViaefc>

<https://livebook.manning.com/book/micro-frontends-in-action/micro-frontends-in-action/>

<https://micro-frontends.org/>

[Talk in Vodqa on Testing Strategy https://www.youtube.com/watch?v=1UEd5IJQ8G0](https://www.youtube.com/watch?v=1UEd5IJQ8G0)

<https://github.com/e-commerce-platform-with-microfrontends>



Thank You

Vishal Sharma