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MODERN FRONTEND ARCHITECTURES ANALYSIS

Frontend architecture comprises a bunch of practices and tools that upgrade application's code quality. What's more, it also presents the opportunity to create a productive, scalable, and sustainable workflow. Frontend architecture can be divided into two main categories: micro frontends and monolithic frontends.

In micro frontend approach each team is responsible for a small self sufficient application which implements part of big system functionality. All applications built and delivered separately. The shell application composes all micro frontend applications into one system and delivers it to the end user. Micro frontend approach improves flexibility, scalability and maintainability of the systems.

Micro frontend advantages:

- Technology agnostic: Teams are independent in technology choice and able to upgrade and maintain their stack without coordination with other teams. It gives teams more flexibility to choose the best technology for each micro frontend.
- Codebase isolation: Micro frontend application codebase isolated from other development teams, which simplify structuring and maintenance.
- Developer productivity: Micro frontends can help to improve developer productivity by allowing teams to work on different parts of the application independently. This is because micro frontends can be developed and deployed independently, without affecting the rest of the application.
- Active usage of native browser features: The micro frontend encourages teams to use native browser features instead of custom API's for communication between applications.

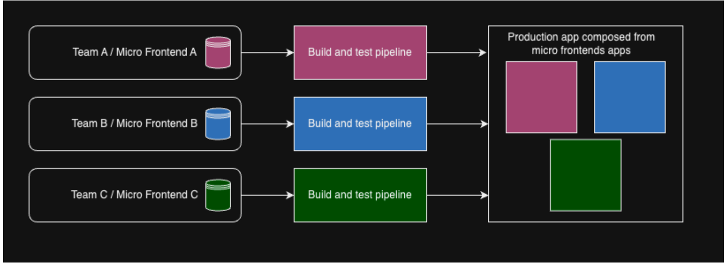
Team A / Micro Frontend A
Team B / Micro Frontend B
Team C / Micro Frontend C
Build and test pipeline
Build and test pipeline
Build and test pipeline
Production app composed from micro frontends apps

Fig. 1. Micro frontend delivery architecture

Monolithic frontend architecture is a traditional web application architecture in which all of the frontend code is contained in a single codebase. This means that the entire user interface (UI) and all of the functionality of the application are implemented in a single, large codebase.

Main advantages of monolithic frontend architecture:

- Simplicity: Monolithic frontends are easy to understand and develop. All of the code for the UI is in a single place, making it easy to find and modify.
- Performance: Monolithic frontends can often perform better than Micro Frontends due to reduced overhead. There is no need to communicate between different Micro Frontends, and the code is typically more optimized.
- Cost: Monolithic frontends are typically less expensive to develop and maintain than Micro Frontends. There is no need to develop and maintain separate codebases for different Micro Frontends.

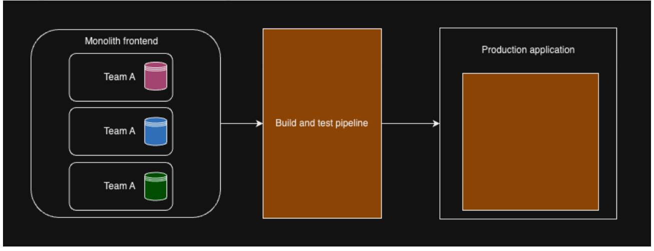

Fig. 2. Monolith frontend delivery architecture

Choosing right frontend architecture depends on project requirements, budget and resources. Micro frontend will fit for large and complex applications with a lot of development teams, it will allow quickly and easily scale and provides freedom for the teams in the technologies usage. Monolith frontend is ideal for small and simple applications, it will speed up development, simplify maintenance, reduce product delivery time and budget expenses.

RESOURCES

1. Luca Mezzalira, Building Micro-Frontends: Scaling Teams and Projects, Empowering Developers
2. Michael Geers, Micro Frontends in action
3. Micro Frontends URL: https://martinfowler.com/articles/micro-frontends.html
4. Microfrontends vs. Monolithic Frontend: Which Is Right for Your Project? URL: https://levelup.gitconnected.com/microfrontends-vs-monolithic-frontend-which-is-right-for-your-project-2980c6939a36