

BadmintonPro Deliverable 3

Diagrams:

Diagram C1:

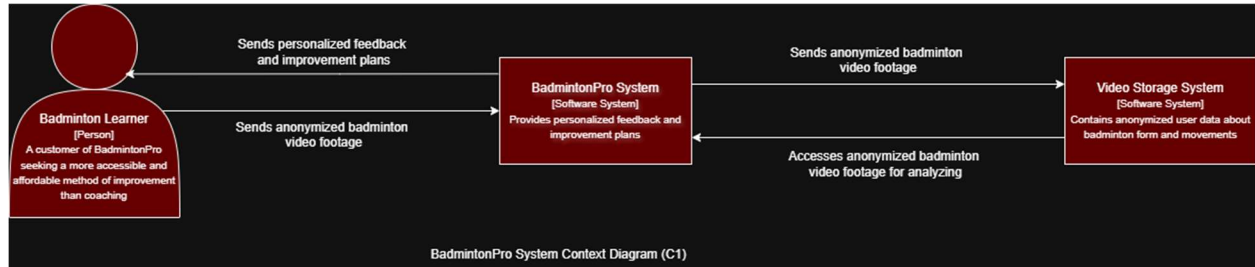


Diagram C2:

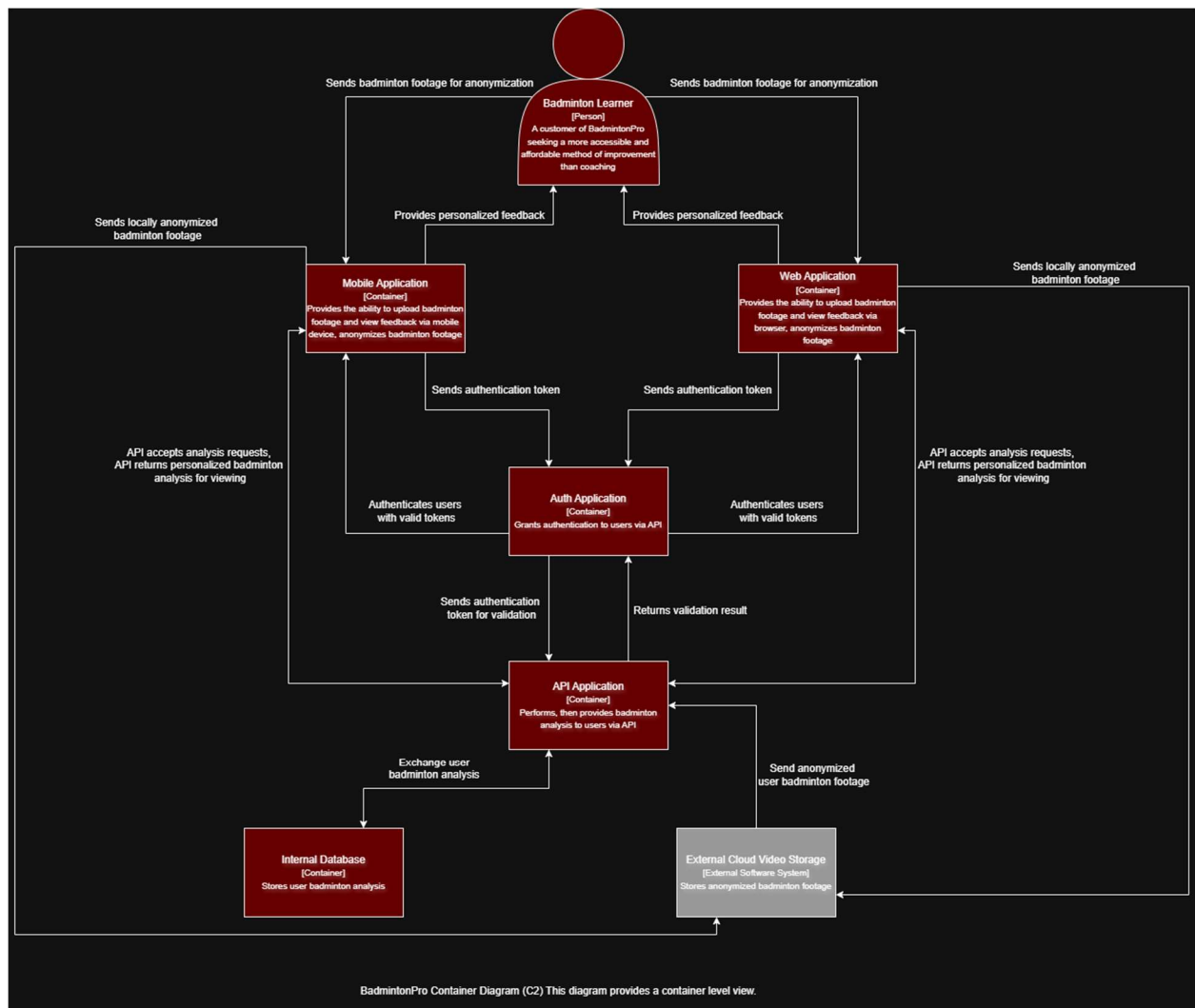
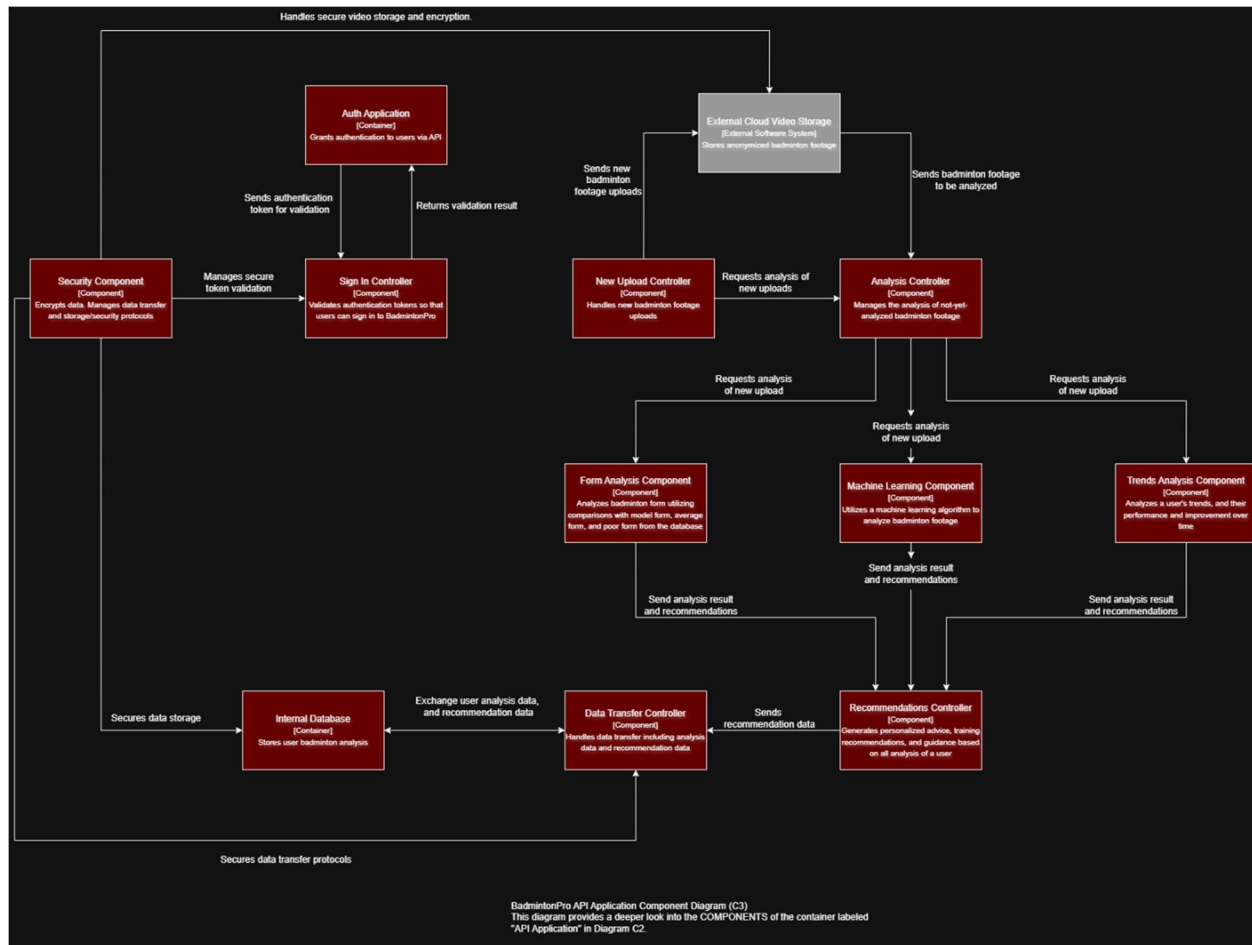


Diagram C3:



Brief description as well as some points that may not be obvious from solely reading the diagrams:

BadmintonPro's architecture is split into modular components. REST API is used to ensure operational excellence and security

(https://github.com/kz426/BadmintonPro/blob/main/arch-decision/ADR_5-DataTransfer.md) and secure HTTPS and JSON transfers. Users sign in through either mobile or browser through the Auth Application which uses the Sign In Controller. The mobile and browser apps are both locally licensed software that has the ability to

anonymize user data locally, before being sent to our systems

(https://github.com/kz426/BadmintonPro/blob/main/arch-decision/ADR_3-Hybrid.md). .NET MAUI for UI ensures operational excellence because the UI would be largely universal across all platforms, browser or mobile app.

The New Upload Controller receives new footage requests, and the footage is sent to the Analysis Controller. The footage is analyzed by three different components applying

different angles. Then the recommendations are aggregated and pass through more controllers to be transferred to the database.

BadmintonPro's architecture features a Multicloud infrastructure, promoting scalability, resiliency, and cost efficiency (https://github.com/kz426/BadmintonPro/blob/main/arch-decision/ADR_1-Multicloud.md) and badminton footage storage is also handled by the cloud (https://github.com/kz426/BadmintonPro/blob/main/arch-decision/ADR_2-VideoStorage.md). The "Internal Database" is a SQL database that facilitates atomic and consistent operations.

Security is prioritized with components that encrypt data, utilize authentication tokens to secure access to the application, as well as secure REST API data transfers (https://github.com/kz426/BadmintonPro/blob/main/arch-decision/ADR_5-DataTransfer.md).

The project is very cost effective due to the optimization of resources. Locally, anonymization operations take place on the user's system which eases unnecessary load on the cloud servers. Multicloud architecture is particularly efficient in that resources are only paid for as needed.

Multicloud infrastructure is naturally scalable, but the architecture is highly organized as well. BadmintonPro's many modular components independently scale, utilizing efficient algorithms.

The project is resilient due to data storage and processing both being handled by multiple cloud platforms. If one cloud goes down, backup cloud platforms can ease recovery. From a hybrid standpoint, if the licensed local software has issues, the user can reboot or redownload the software and simply reupload their footage.

Please note that the "External Cloud Video Storage" container is depicted in grey. Many good choices are available for our project, but our current choice currently is Amazon S3, which is subject to change. This gray container represents the external black box service that this project utilizes.