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Design and architecture

Assignment description

Describe the functional requirements of the system, and out of those requirements, identify the key services as stand-alone autonomous business units often called microservices.

Clearly define the scope of each microservice with interservice communication patterns.

Demonstrate the architecture with UML diagrams of your choice and a single architecture diagram describing the whole system architecture with a strong focus on communication.

Clearly demonstrate the communication pattern used and describe the limitations around communication for microservices.

Document

The chosen system to be implemented is an on-demand video streaming service.

Functional requirements

Requirement	**Explanation**
User authentication	The software checks the credentials and acts accordingly
User management	The software knows the status of the user and additional information related to the user
Homepage	Shows content that is appealing to many users, new releases and possibly tailored content. Easy to navigate to other parts of the app
Searching	Ability to search by metadata information, show title, genre, language etc.
Review	Give feedback of one's opinion of the watched video
Video metadata	Store and show the metadata related to the individual video

Autonomous business units (microservices) and scope

The identified key services as microservices and their scope.

Authentication microservice

Responsible for user authentication and generating tokens. Authorization only occurs at the edge, after the user can access all the other microservices. API gateway for microservices to request the identified user.

User management microservice

Manages user information, name, e-mail etc. Available after user has authenticated. API to get the user information.

Homepage microservice

Responsible for all the information to be seen on the homepage. Multiple API points to fill the front-end application and for searching, review and metadata.

Searching microservice

Handles the searching of videos. Communicates with video metadata microservice. API point for homepage.

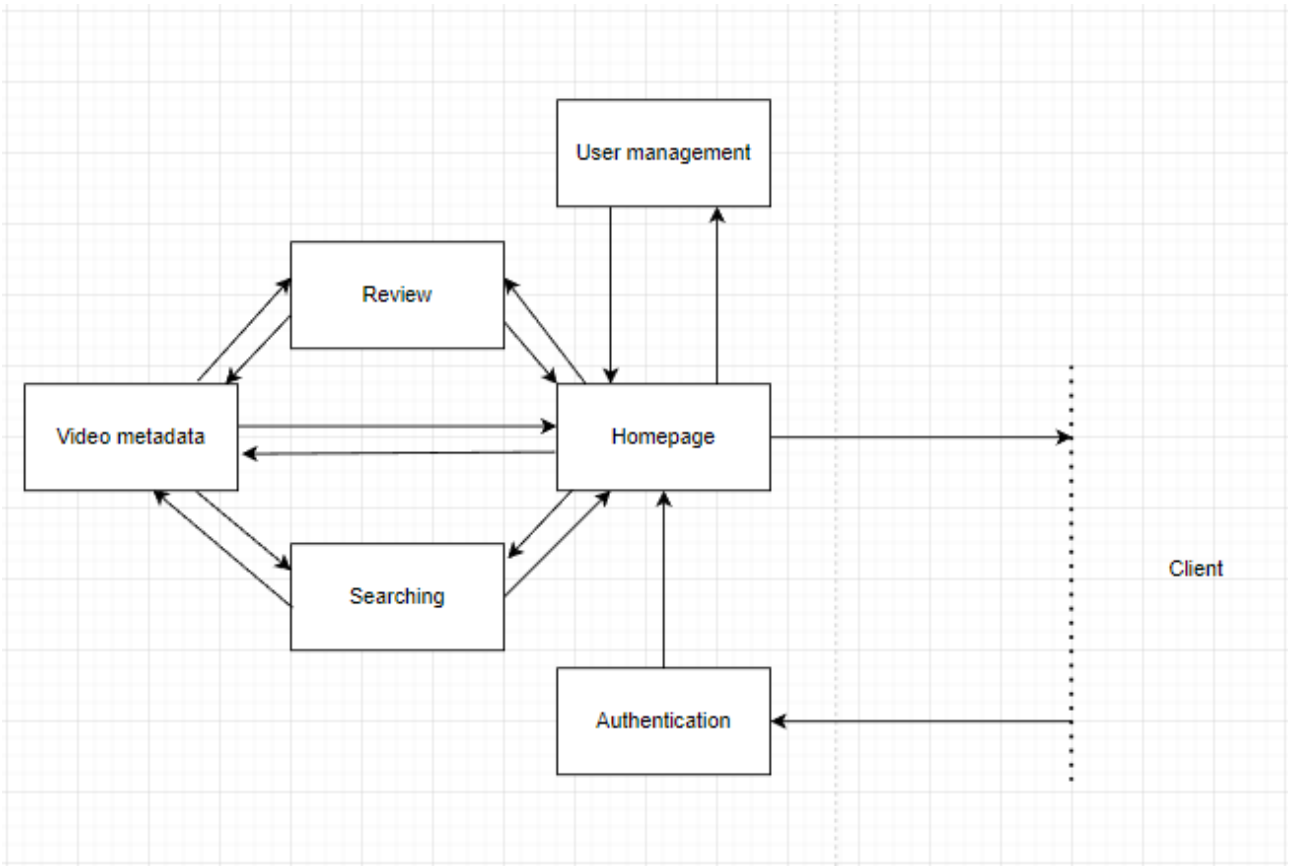
Review microservice

Similar to searching microservice. Handles the reviewing of the videos. Communicates with video metadata microservice. API point for homepage.

Video metadata microservice

Responsible for the video metadata handling. API points for review, searching and homepage.

Architecture diagram



The inter-service communication has been demonstrated with the arrows. The arrows represent requests and responses.

Communication pattern and limitations

The used communication pattern is REST. Microservices communicate through requests and responses.

Client sends a request to the authentication microservice, which authorizes the user and sends a request to the homepage, which responses accordingly to the client. Homepage has the ability to communicate with all the microservices. User management and video metadata should probably have some sort of database to communicate with.

The limitations that this architecture system might encounter could be network latency, as the requesting microservice is waiting for a response. The authentication system and microservice could cause security problems as well, as after getting through the individual authentication microservice, user gains full access to the rest of the microservices. Data inconsistencies could occur as user could be giving a review, that wouldn't update to a different user, but that is about it. As review and user management microservices don't communicate directly, that could as well cause latency issues if reviews are linked to user, how they should be.