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How to design system like Telegram: Part 2 System Architecture

🌐 System Architecture: Client-Server Model

▪ Decentralized Servers: Telegram's architecture likely utilizes servers globally distributed. This enhances data transfer speeds and reliability, with users connecting to the nearest server.

▪ Client Applications: Including mobile apps (iOS, Android), desktop applications (Windows, macOS, Linux), and web clients (HTML5, CSS, JavaScript).

💡 Microservices Architecture

▪ Service-Oriented Design: Features like messaging, file transfer, notifications are managed by separate microservices.

▪ Inter-Service Communication: Microservices communicate via HTTP/REST or messaging queues.

▪ Containerization and Orchestration: Likely uses Docker and Kubernetes for better scalability and resource management.

🚀 Advantages of This Architecture

▪ Scalability: Easier scaling of individual system components.

▪ Resilience: Prevents a single service failure from affecting the entire application.

▪ Flexibility: Simplifies updates and new feature additions.

▪ Load Management: Efficiently manages and distributes user load, reducing server overload risks.

⚠️ Challenges

▪ Complexity: Requires advanced tools for managing and troubleshooting.

▪ Latency: Minimizing latency in real-time applications is crucial.

▪ Consistency: Essential to maintain data consistency across systems for a good user experience.

🔍 Summary

Telegram's system architecture, combining a client-server model with a microservices approach, offers a robust, scalable, and efficient messaging platform. It supports a large, global user base while facilitating continuous development and feature enhancements.

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