

Assignment - Decode the Network Behind Your Favorite App

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DISCORD



Discord is a popular communication app used by Gamers for chatting via text, voice, and video while playing games . It heavily depends on computer networking to function smoothly. Every time a user opens Discord, a complex series of network activities takes place to ensure fast and reliable communication across the globe

When a user logs into Discord, the app connects to Discord's authentication servers through the HTTPS protocol. This allows the system to verify the user's identity securely. Once logged in, discord establishes a persistent WebSocket connection with Discord's real-time communication servers. This WebSocket connection enables instant updates such as receiving messages or seeing who is online without needing to refresh the app.

Sending a message or joining a voice channel also triggers more networking activity. For instance, voice and video calls on Discord use the UDP protocol, which offers faster transmission of data compared to TCP, though it sacrifices some reliability. Discord uses STUN and TURN servers to help devices connect directly with each other, even if they are behind firewalls or NAT (Network Address Translation) systems. For audio communication, Discord uses the Opus codec, which compresses voice data without losing much quality.

Several layers of networking infrastructure are involved in running Discord. These include the user's device (a computer or mobile phone), Discord's backend servers hosted on platforms like Google Cloud and AWS, load balancers that manage traffic, content delivery networks (CDNs) that deliver images and files efficiently, and voice servers that ensure low-latency communication for real-time calls.

The protocols used in Discord vary based on the function. HTTP and HTTPS are used for general API calls, including login and fetching messages. WebSockets keep the chat interface live and responsive. UDP is used for real-time voice and video data transfer. TCP is used where reliable data delivery is important, like in text messages or file uploads. DNS (Domain Name System) resolves human-readable domain names like "discord.com" into IP addresses so devices know where to connect.

