Streaming App

Tech Stack

Frontend

Platform	Tech Stack
Web	React, WebRTC, Socket.IO, Tailwind
Android / iOS	React Native, WebRTC (via packages like `react-native-webrtc`), Socket.IO

Useful Packages:

- `react-native-webrtc` – WebRTC in React Native

- `socket.io-client` – real-time communication

- `peerjs` or `simple-peer` – for easier WebRTC setup

- `expo-av` – optional for native camera/microphone access

Backend

Component	Tech Stack
API Server	NestJS (with REST + WebSocket)
Realtime	Socket.IO Gateway (NestJS)
Streaming	WebRTC signaling server
Auth	Clerk/Auth0/Firebase Auth
Media Server	See suggestions below

Database

- MongoDB (for users, stream metadata, chat history)

- Redis (optional for caching or stream status)

File Storage

Content Type	Suggested Storage
Stream Recordings	AWS S3, DigitalOcean Spaces, or Wasabi
Thumbnails	S3 or a CDN proxy
User Avatars	Cloudinary or S3
Transcoded Videos	S3 with FFmpeg or AWS Elemental MediaConvert

WebRTC, PeerJS, Socket.IO and Alternatives

WebRTC

- Peer-to-peer audio/video streaming
- Best for 1:1 or small groups
- Needs TURN/STUN servers for NAT traversal

PeerJS

- Simplifies WebRTC setup
- Self-hostable signaling server
- Can be replaced with SimplePeer or a custom Socket.IO-based solution

Socket.IO

- Real-time communication for chat, status updates, signaling
- Works well with NestJS and React Native

Alternatives and Additions

Technology	Use Case
Mediasoup	Scalable WebRTC SFU for group calls

Janus	WebRTC gateway with SFU/MCU support
LiveKit	Open-source platform for scalable WebRTC
Agora / Twilio	SaaS-based streaming APIs
HLS/DASH + NGINX RTMP	For large-scale one-to-many live streams
Redis Pub/Sub	Realtime updates across app clusters
Kafka	Stream processing for analytics/logs

Suggested Architecture

```
[Client - React/React Native]
    ↕ WebRTC / Socket.IO
[NestJS API Gateway + WebSocket Gateway]
    ↕ REST + WebSocket
[WebRTC Signaling Server or PeerJS]
    ↕
[Media Server (Mediasoup, Janus, or LiveKit)]
    ↕
[Cloud Storage (S3) + MongoDB + Redis]
```

Security

- JWT-based authentication for API and WebSocket

- Secure TURN/STUN servers (e.g., coturn)

- CORS and rate limiting

- End-to-end encryption over WebRTC (optional, depending on need)

DevOps and Deployment

Component	Tools
Backend Hosting	AWS, DigitalOcean, Railway
Database Hosting	MongoDB Atlas
CDN	Cloudflare or AWS CloudFront

CI/CD	GitHub Actions, Docker, Railway
Monitoring	Sentry, Prometheus, Grafana
Scaling	Kubernetes (if needed), Docker Swarm