

WebRTC란?

MashUp Node팀 15기 세미나

최재영

0. 📺 실시간 스트리밍의 종류

1. RTMP : Flash 기반, 낮은 지연
2. HLS : HTTP 기반, 안정적이지만 5~10초 지연 발생
3. WebRTC : P2P, 가장 낮은 지연, 설치 필요없음

1. 🌱 WebRTC의 역사

2011년, 구글이 오픈소스로 공개

브라우저끼리 "플러그인 없이" 실시간으로 데이터를 주고받자!

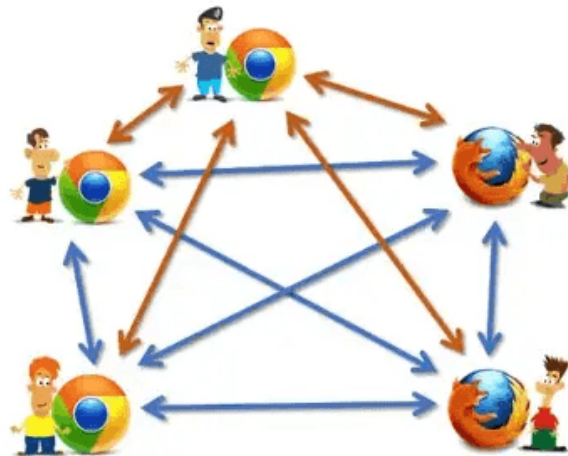
"실시간 양방향 통신"을 위한 기술

그럼 Youtube는?



Mesh

Connections:	4 10
Uplink:	4 mbps
Downlink:	4 mbps
Total:	20 mbps



MCU

Connections:	1 5
Uplink:	1 mbps
Downlink:	1 mbps
Total:	10 mbps



SFU

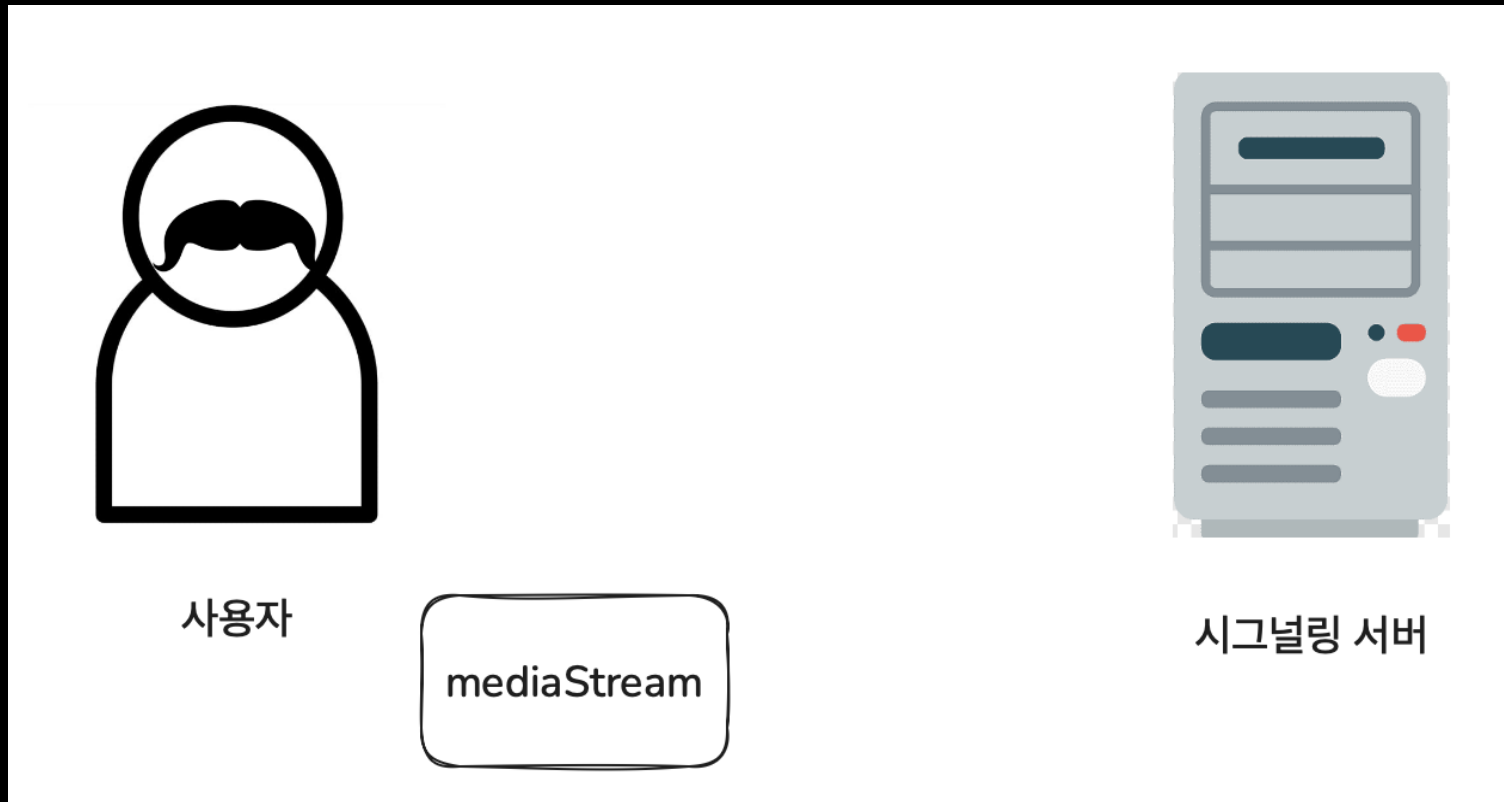
Connections:	5 25
Uplink:	1 mbps
Downlink:	4 mbps
Total:	25 mbps



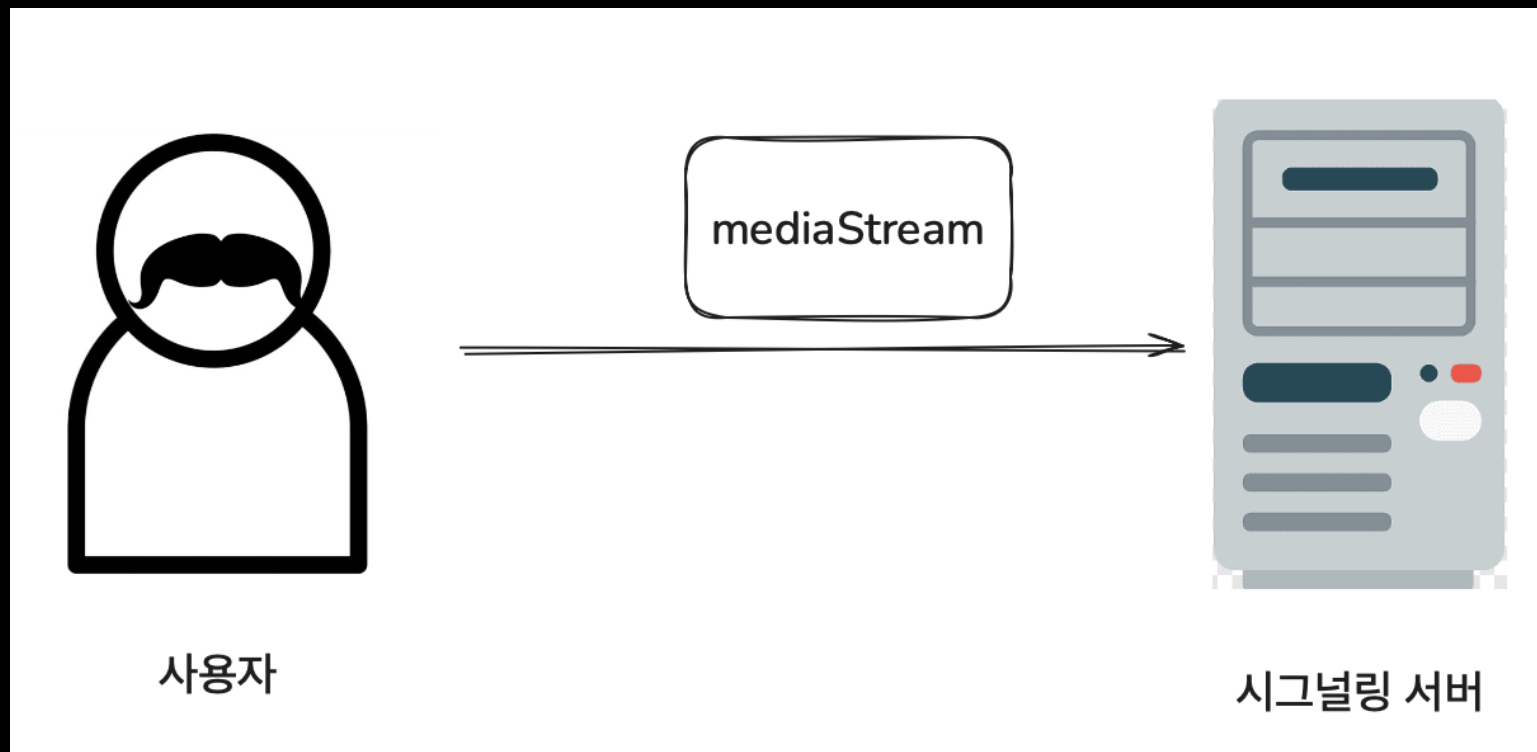


실시간 양방향 스트리밍

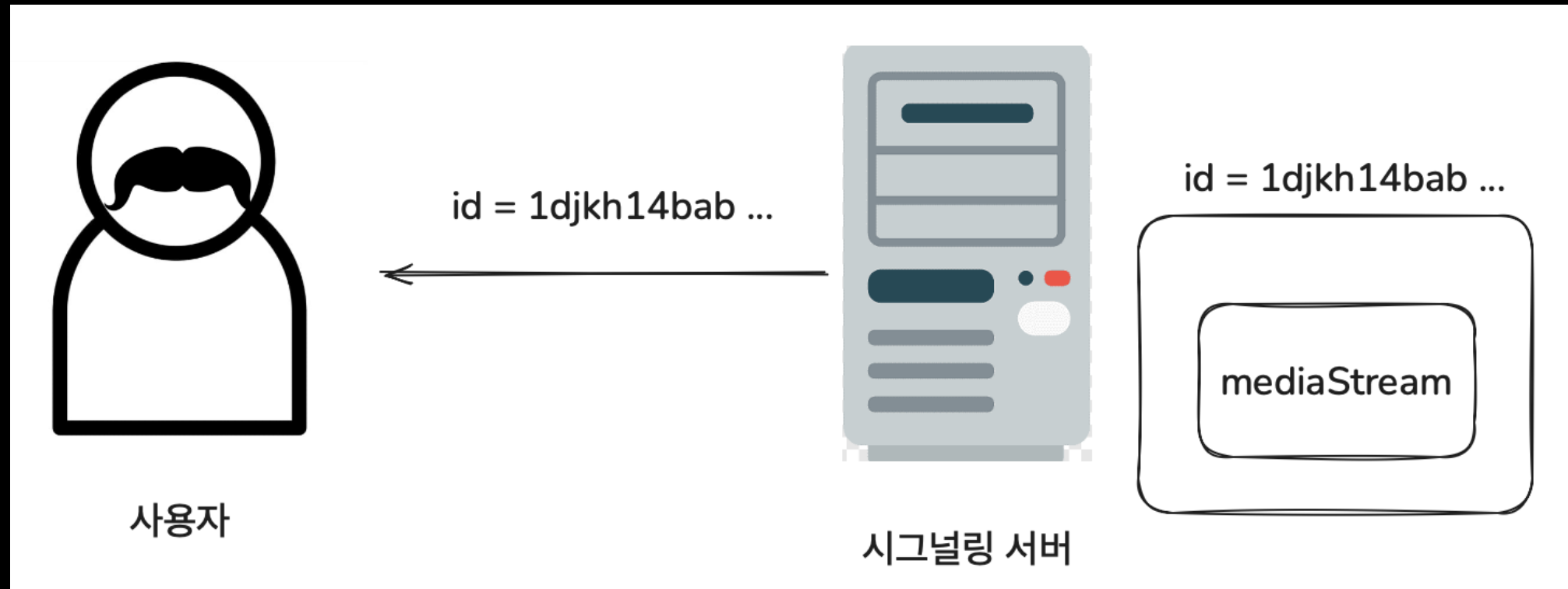
2. 🧪 WebRTC 원리



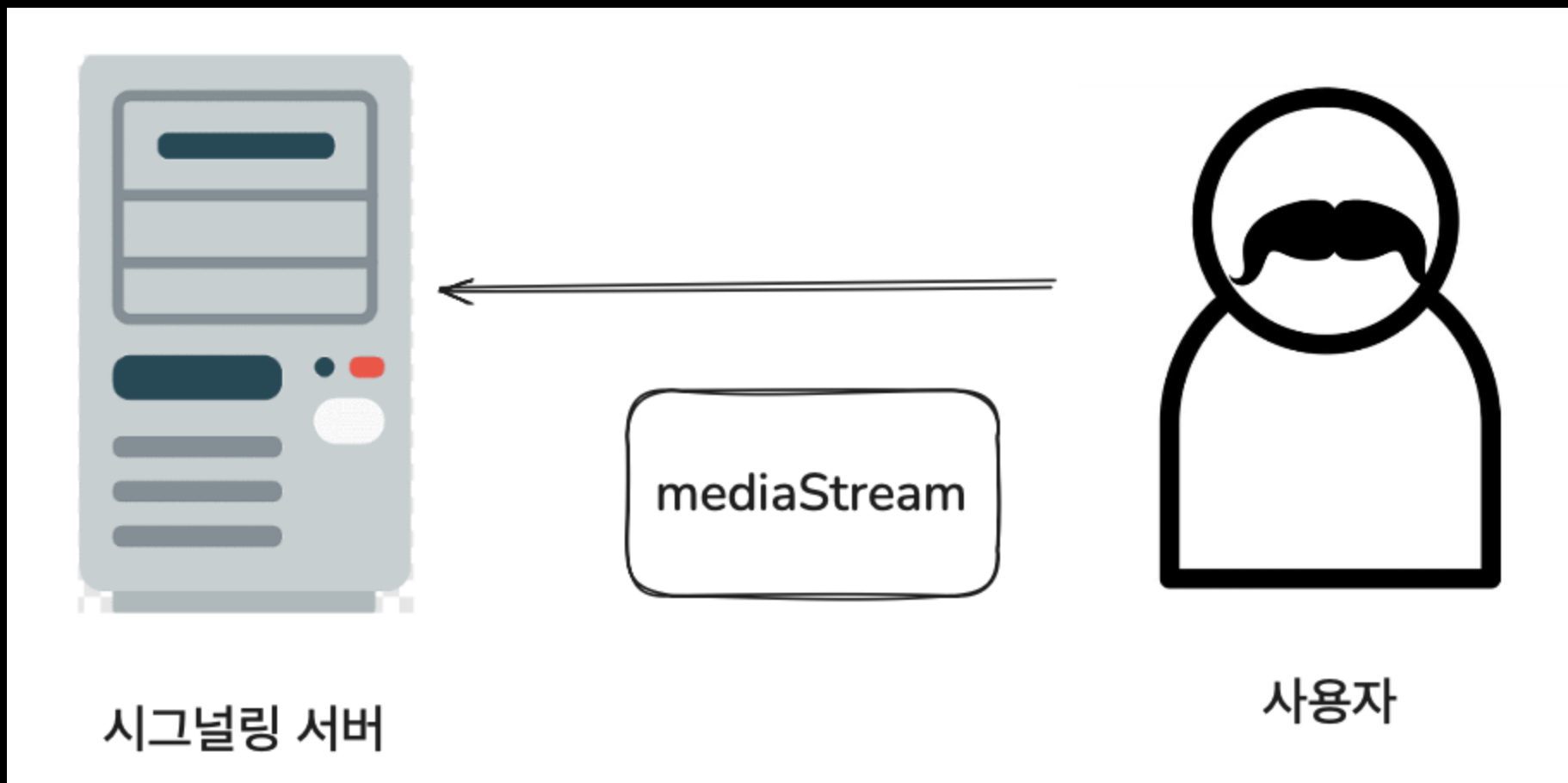
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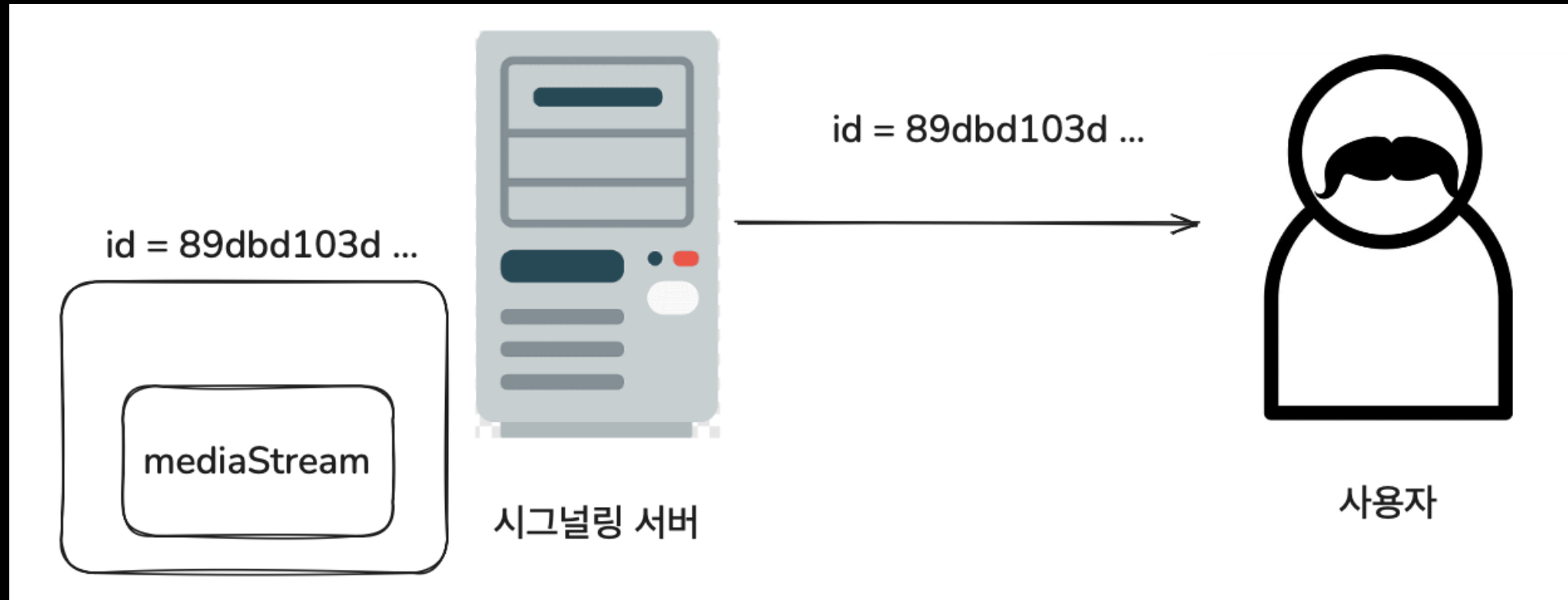
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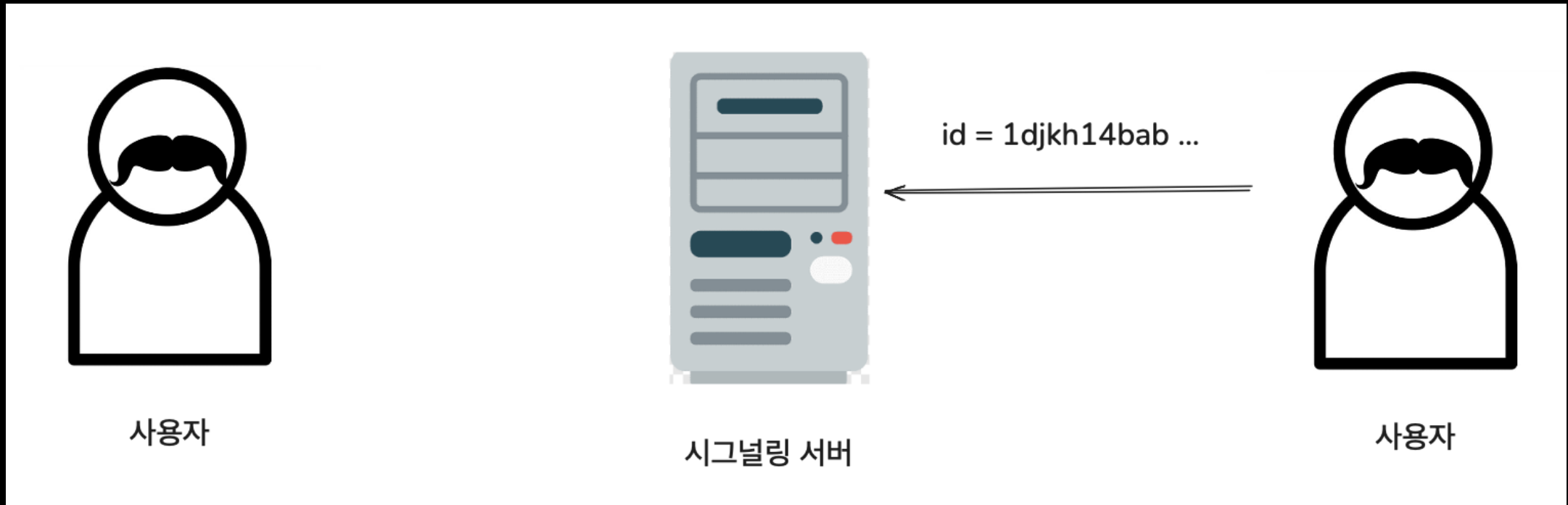
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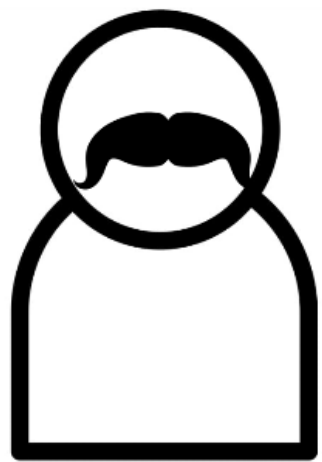
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2. 🧪 WebRTC 원리



사용자

id = 89dbd103d ...
인 사람이 너 찾는데?(offer)



시그널링 서버

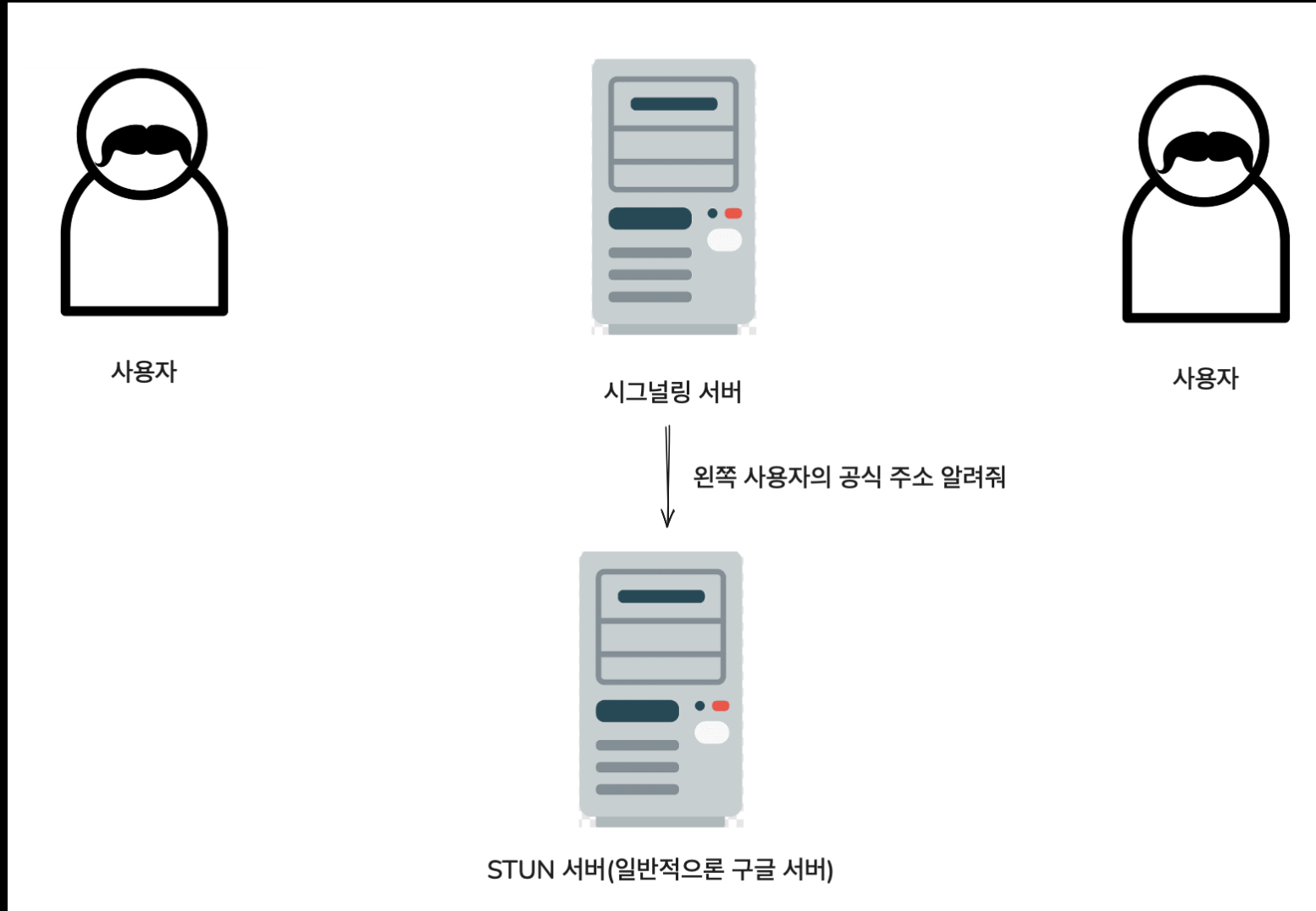


사용자

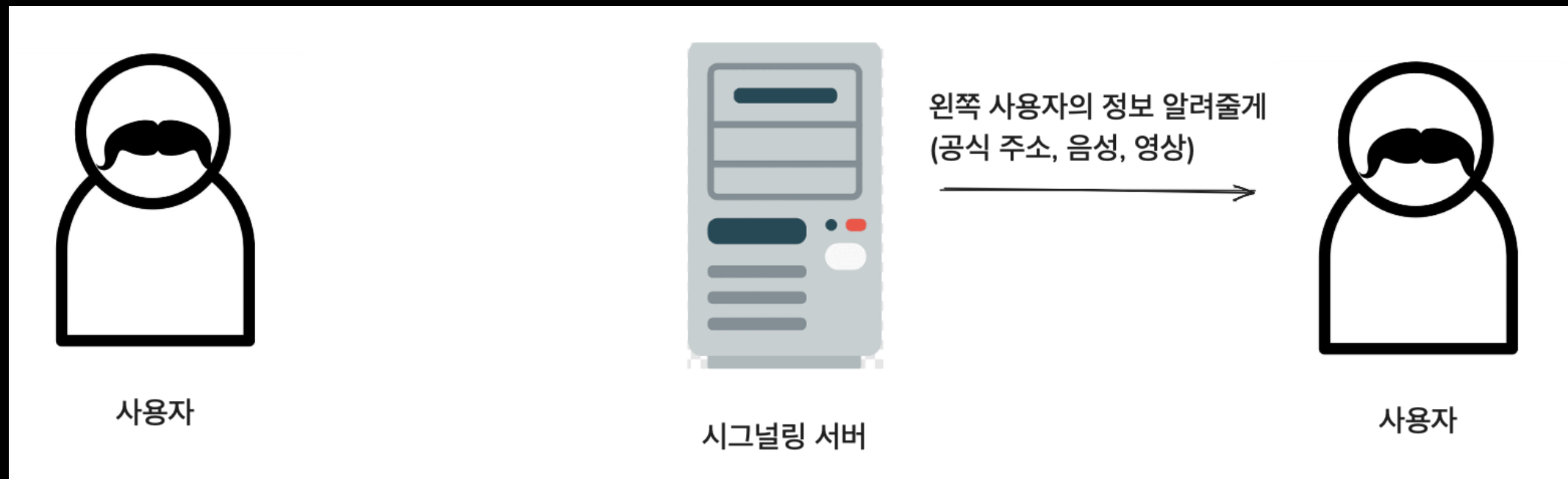
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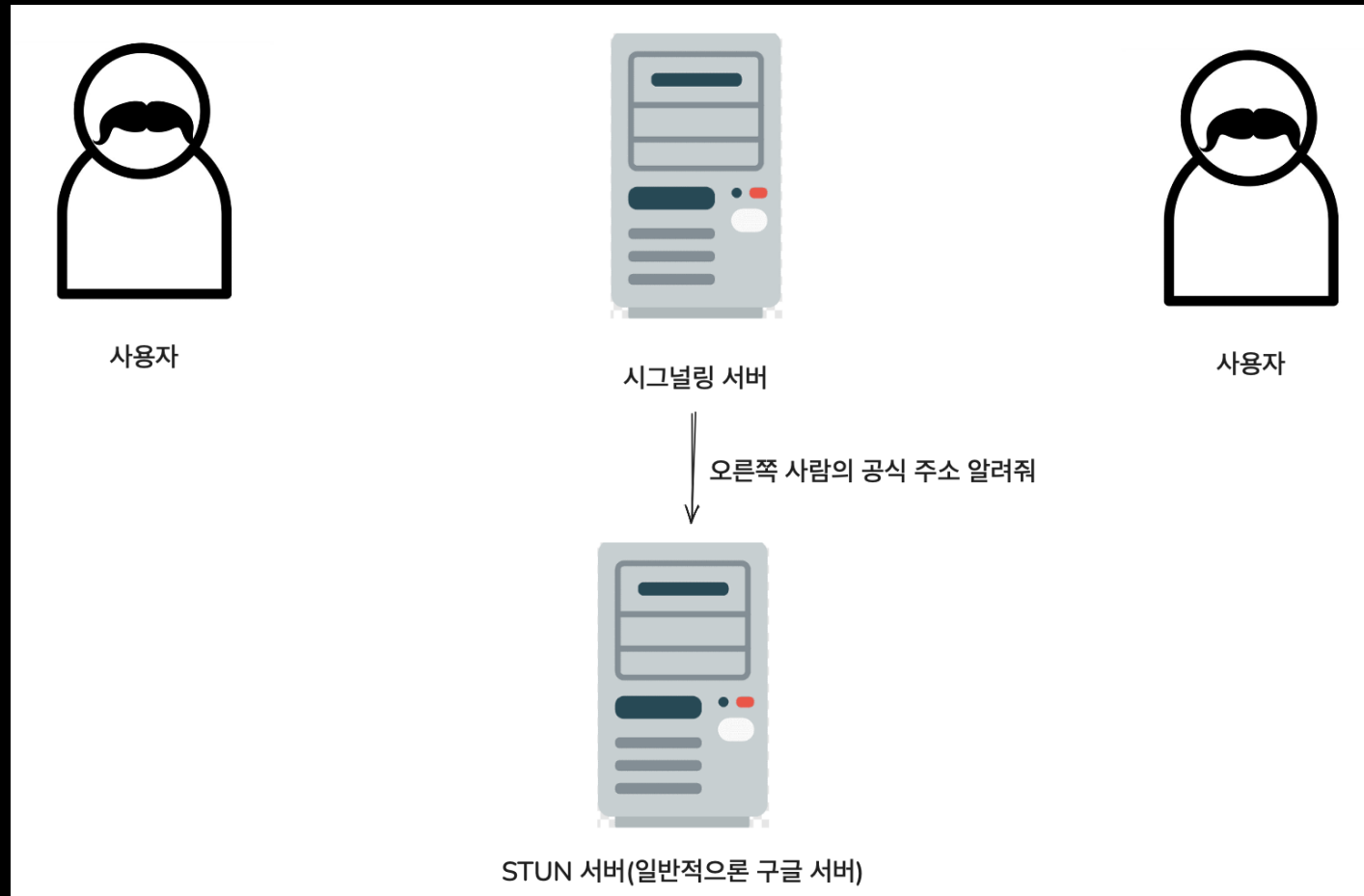
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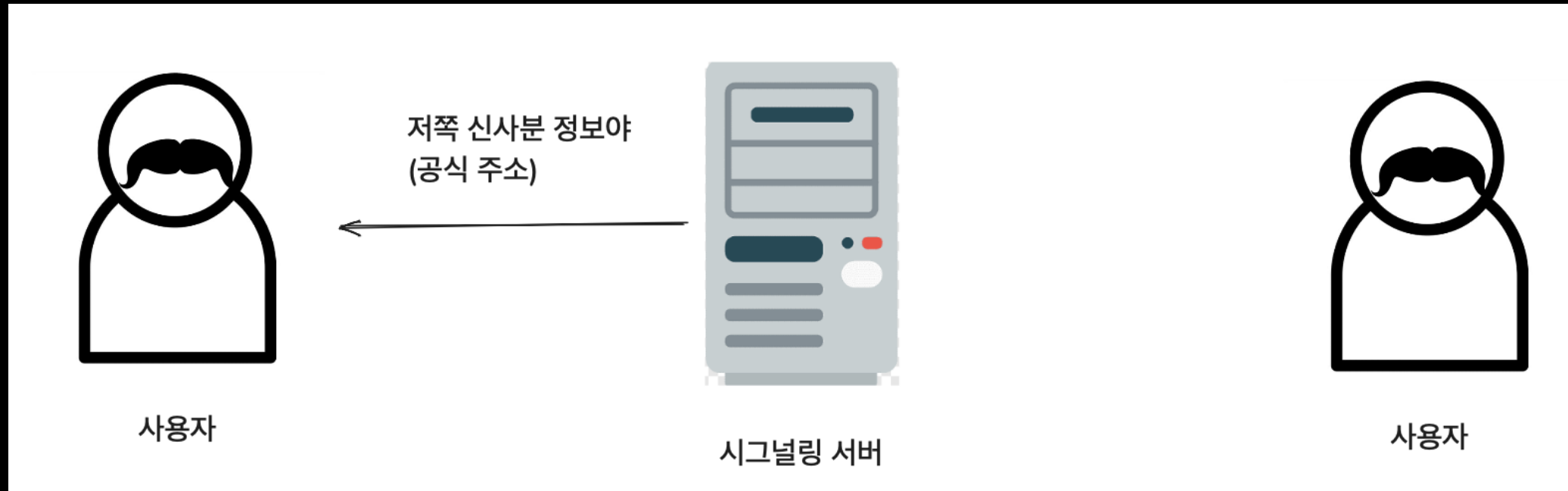
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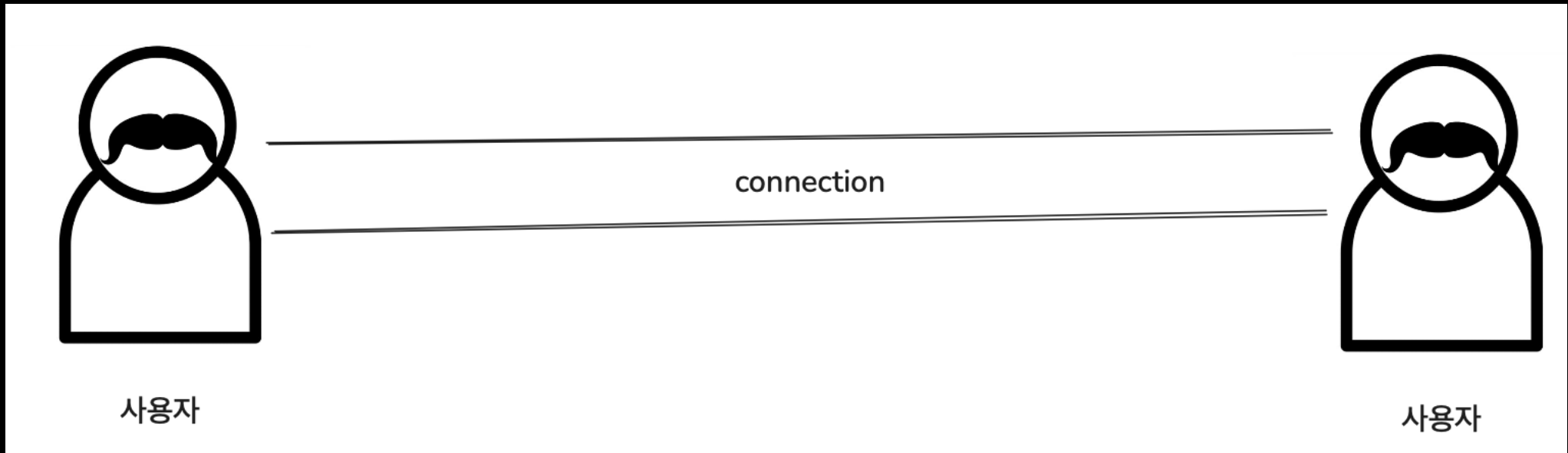
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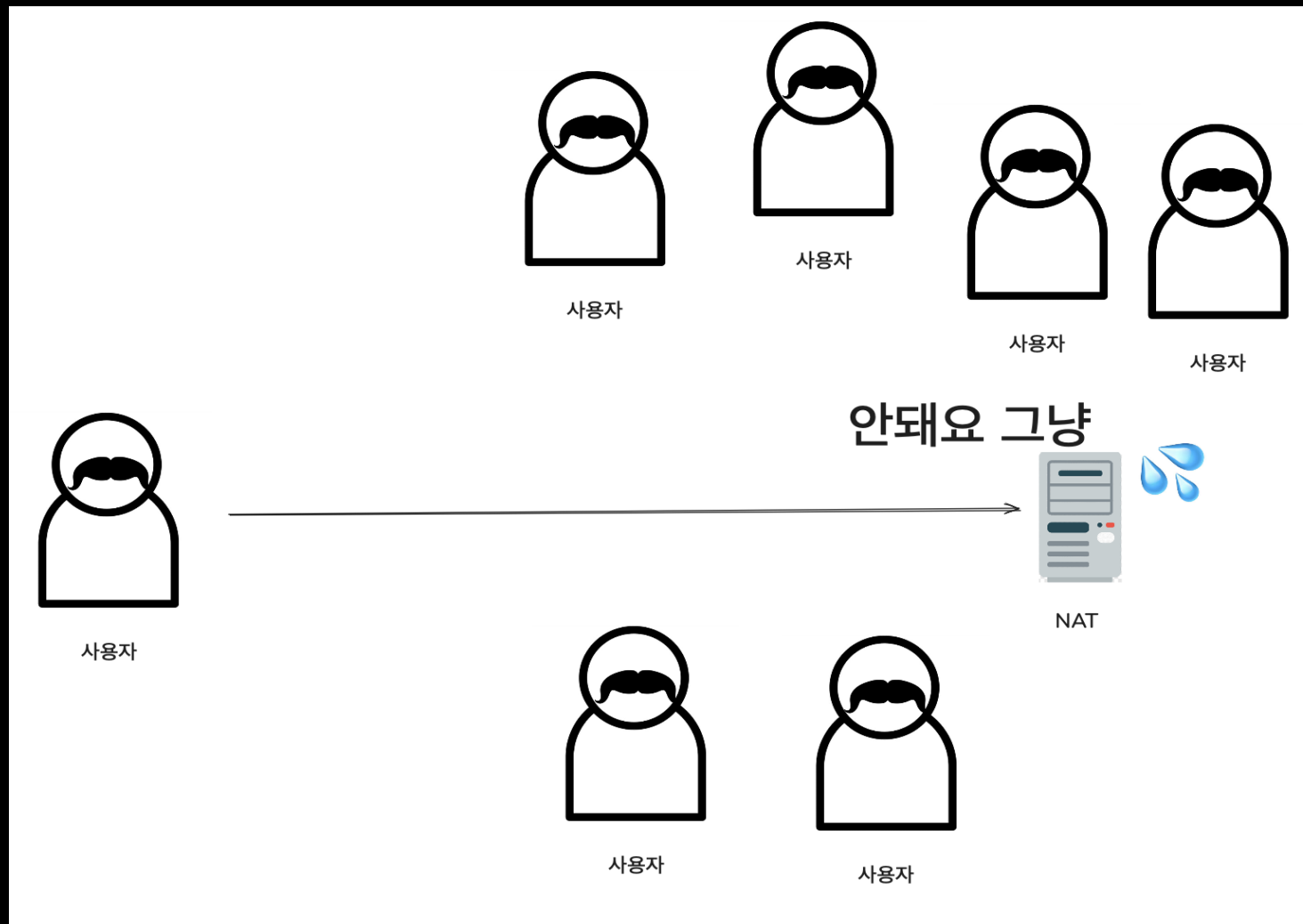
3. 📄 WebRTC 실습

1. git clone ~
2. cd 10min-seminar/15th-최재영-webrtc/code/
3. npm install
4. node server.js
5. 127.0.0.1:3011/client.js

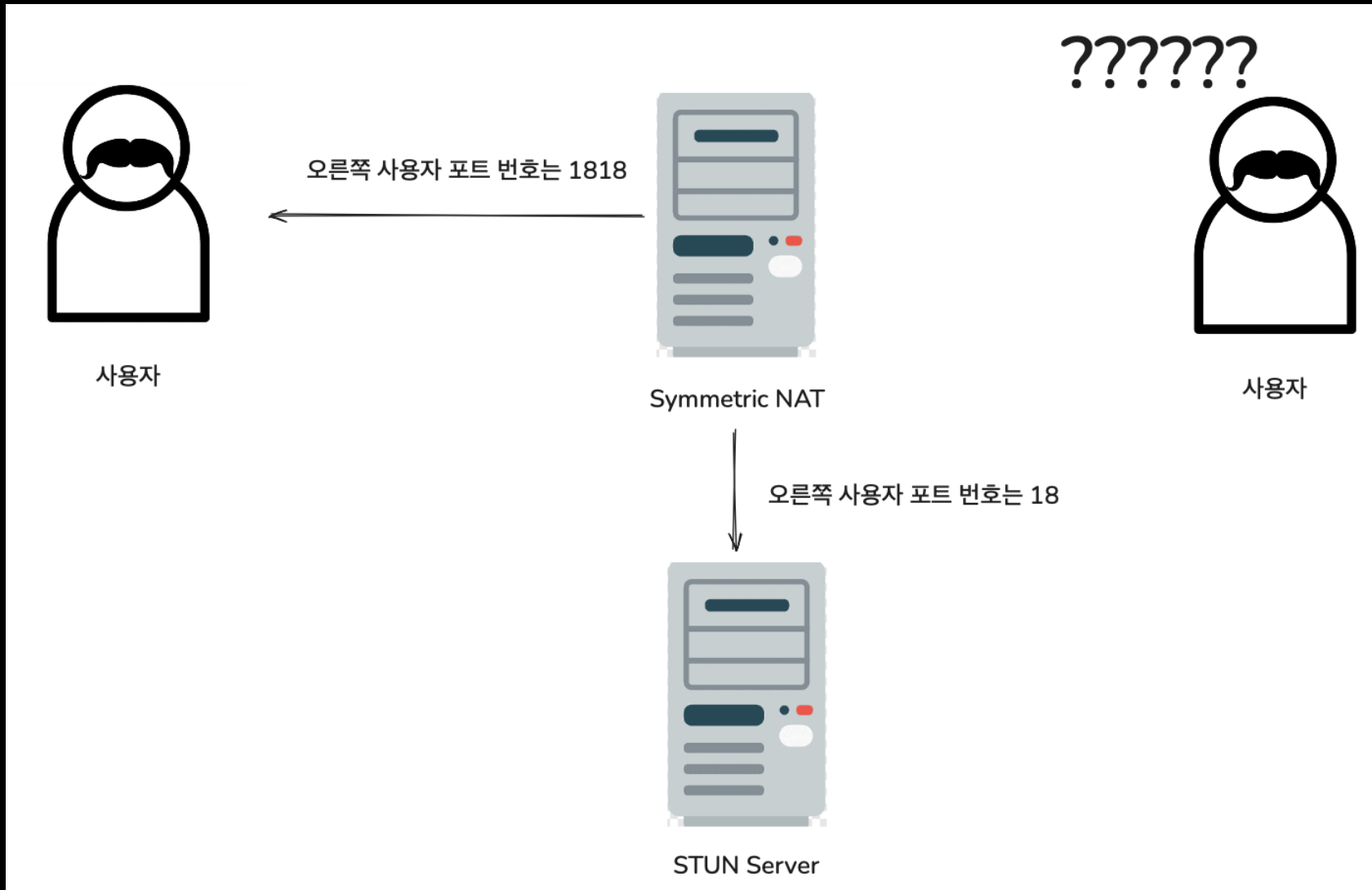
4. 🤔 WebRTC 한계 - 방화벽



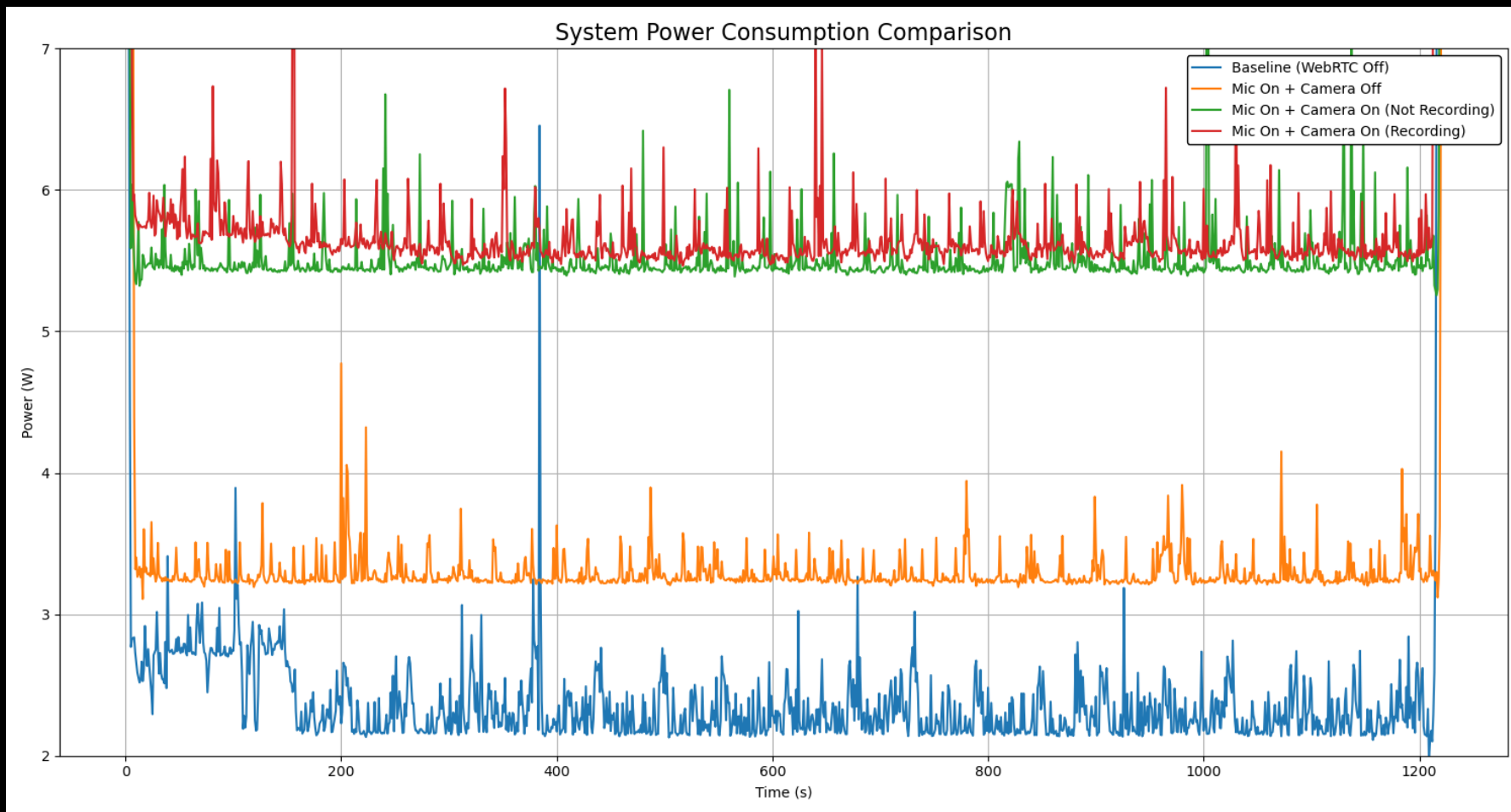
4. 🤔 WebRTC 한계 - 환경



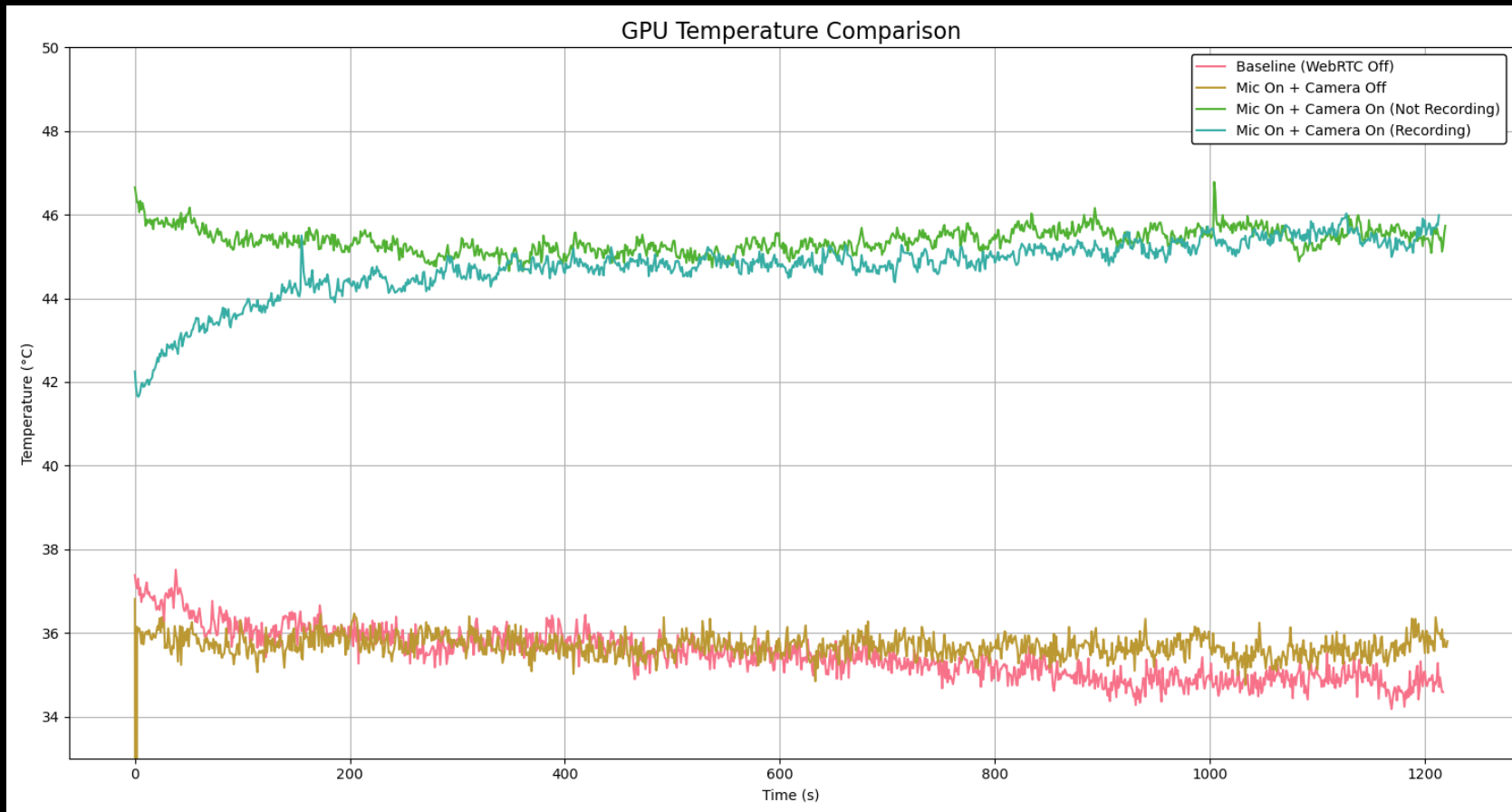
4. 🤔 WebRTC 한계 - NAT



4. 🤔 WebRTC 한계 - 부하



4. 🤔 WebRTC 한계 - 부하



5. 💡 WebRTC 개선 방향

SFU 개선 결과

Mesh vs. SFU

	Mesh 5명		SFU 5명
시스템 소비 전력	13.42W		11.58W
CPU 온도	65.89°C		55.10°C
P-CPU 점유율	17.64%	→	9.11%
네트워크 트래픽	14.4Mbps		9Mbps

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< 1 2 3 >

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