MatrixRTC

The key sharing problem

td
td@technodisaster.com

Disclaimer

- If you see a security vulnerability, please come to me after the talk.

How do other providers do it?

- Jitsi: uses olm sessions, participants limited to 20

How do other providers do it?

- Jitsi: uses olm sessions, participants limited to 20
- Zoom: own weird protocol where they elect a leader which creates a shared key with all the participants

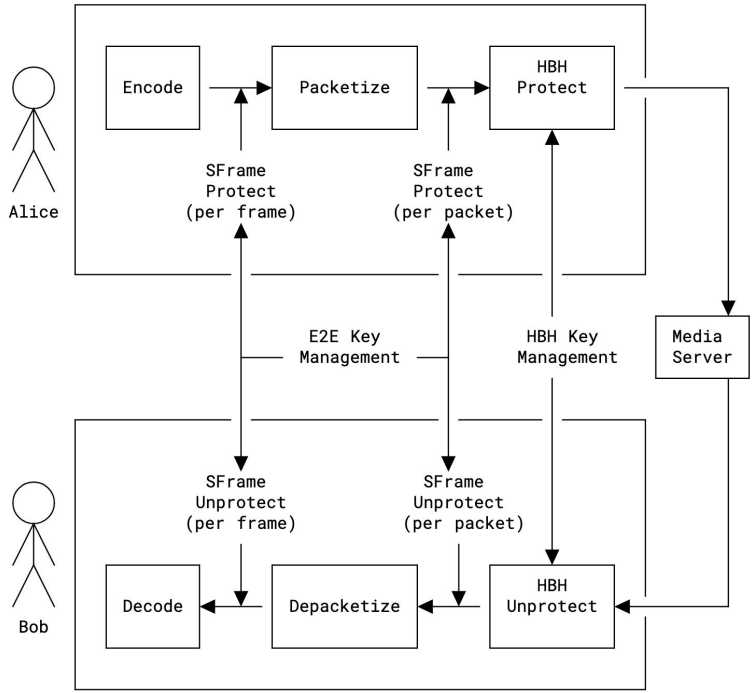
How do other providers do it?

- Jitsi: uses olm sessions, participants limited to 20
- Zoom: own weird protocol where they elect a leader which creates a shared key with all the participants
- Webex, Discord, Cloudflare, Wire - MLS

How do other providers do it?

- Jitsi: uses olm sessions, participants limited to 20
- Zoom: own weird protocol where they elect a leader which creates a shared key with all the participants
- Webex, Discord, Cloudflare, Wire - MLS
- Google meet and Microsoft teams both have a limit of 20–50 participants in true e2ee mode

Current state of MatrixRTC E2EE



Key sharing

Key sharing

- Should be done via a secure channel.

Key sharing

- Should be done via a secure channel.
- Current state, use shared keys or per participant keys.

Key sharing

- Should be done via a secure channel.
- Current state, use shared keys or per participant keys.
- Rotate keys on every leave and join. Creates a burst.

Key sharing

- Should be done via a secure channel.
- Current state, use shared keys or per participant keys.
- Rotate keys on every leave and join. Creates a burst.
- Can be sent via room events or to-device events.

Optimizations in key sharing

Optimizations in key sharing

- Debounce on leave .

Optimizations in key sharing

- Debounce on leave .
- Throttle on join.

Optimizations in key sharing

- Debounce on leave .
- Throttle on join.
- Use ratcheting on join.

Optimizations in key sharing

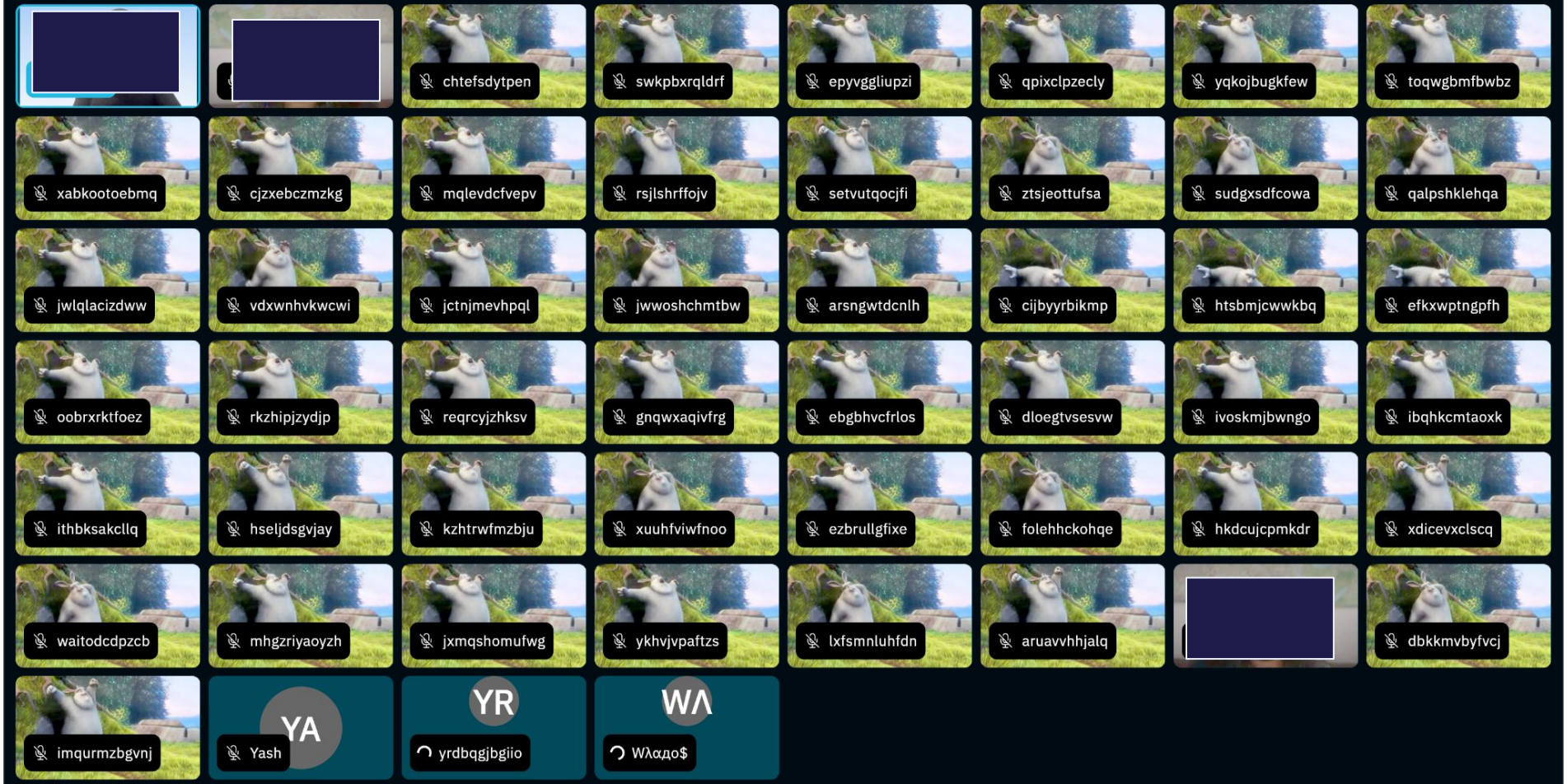
- Debounce on leave .
- Throttle on join.
- Use ratcheting on join.
- Pre-share key on onboarding screen.

Optimizations in key sharing

- Debounce on leave .
- Throttle on join.
- Use ratcheting on join.
- Pre-share key on onboarding screen.
- Retry mechanism, but also rate limit it.

Famedly Call

- Standalone app and integrated in the Famedly messenger
- Used by 2 of the largest university clinics (which specialize in early born)
- 40–50 participants with 720p video turned on for everyone
- Work is being done to combine MLS and Matrix.
- DEMO!



load_test_dev
21:36

52 participants
v1.0.7-44-g8501a16

Thank you!
Questions?

td
matrix: @td:technodisaster.com
email, fedi: td@technodisaster.com