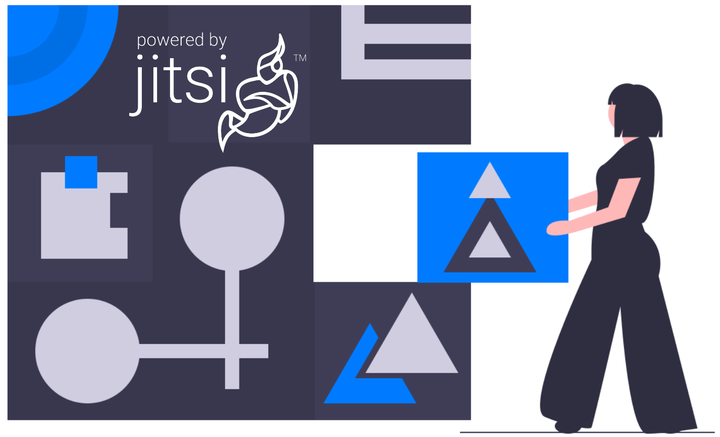
Scaling Jitsi Meet

Challenges running meet.jit.si at scale during the pandemic

Saúl Ibarra Corretgé (saghul) | FOSDEM 2021

jitsi.org
Jitsi Cheers Night
13
34:26

meet.jit.si / 8x8 Meet

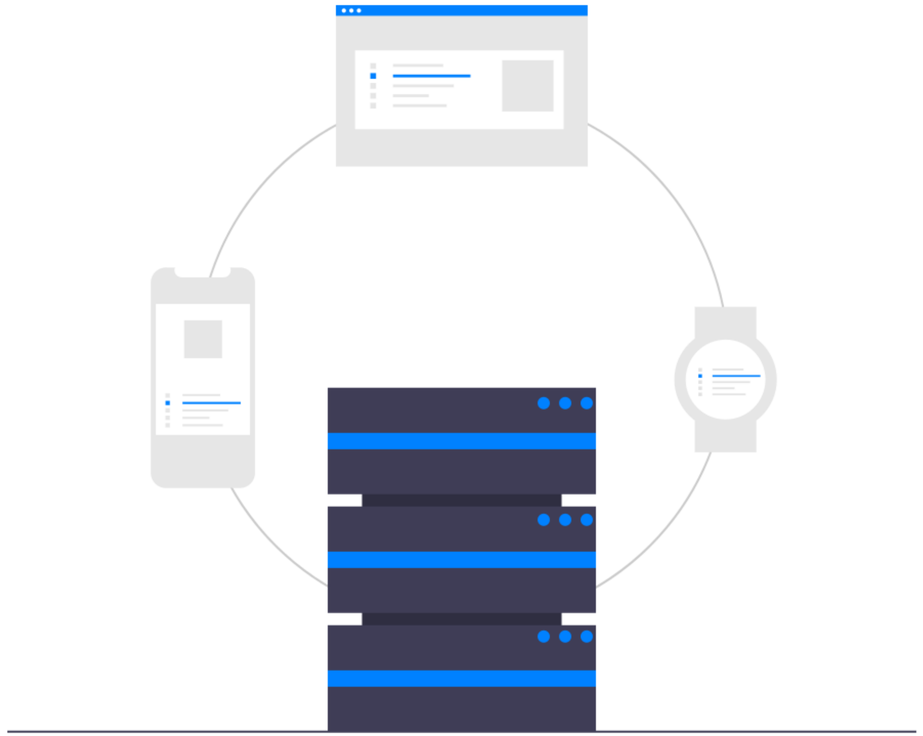


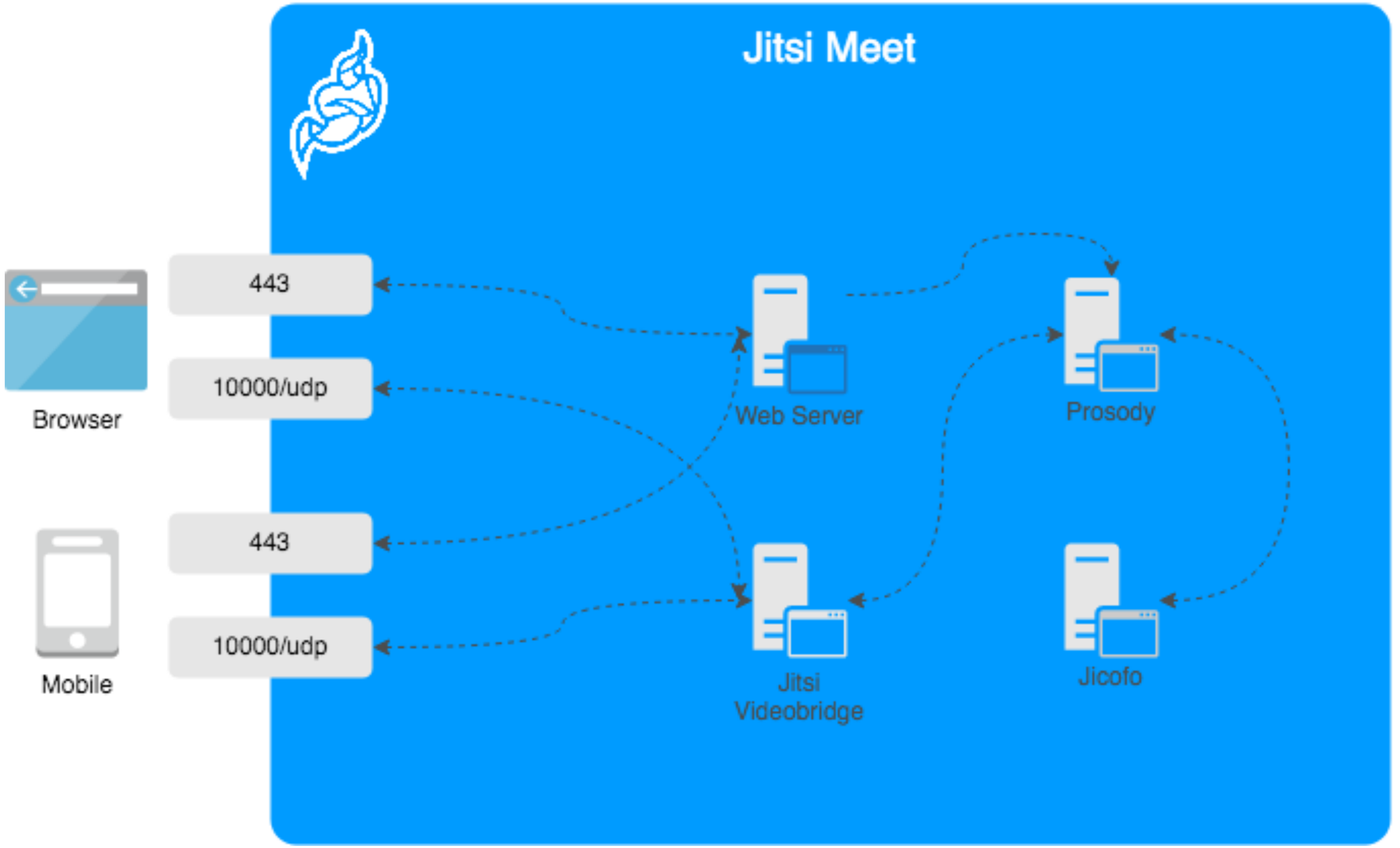
JaaS

Self-Hosting

Jitsi Meet

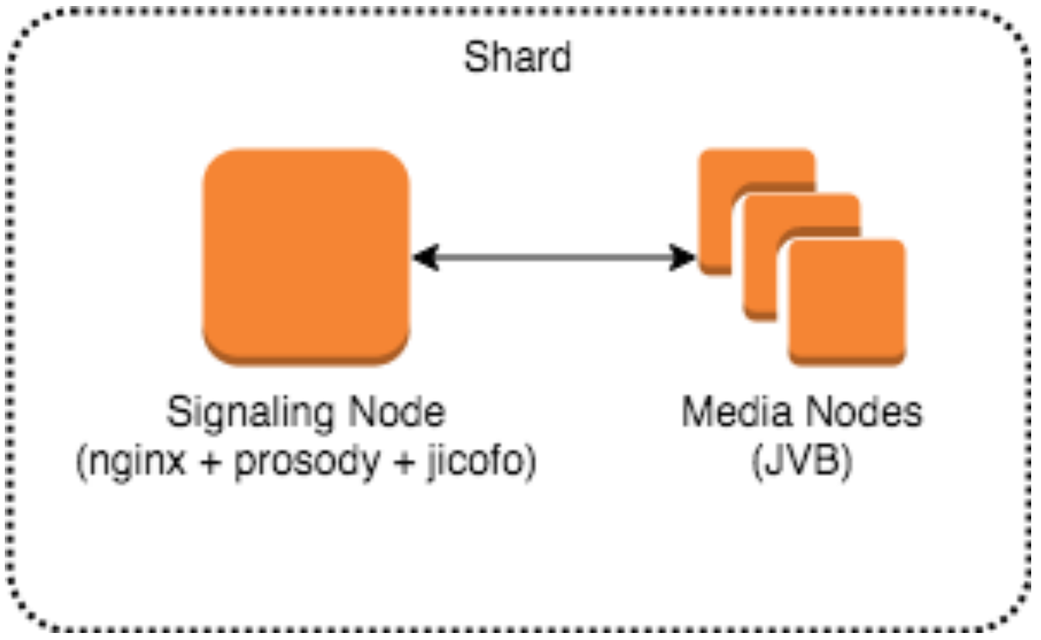
Architecture overview

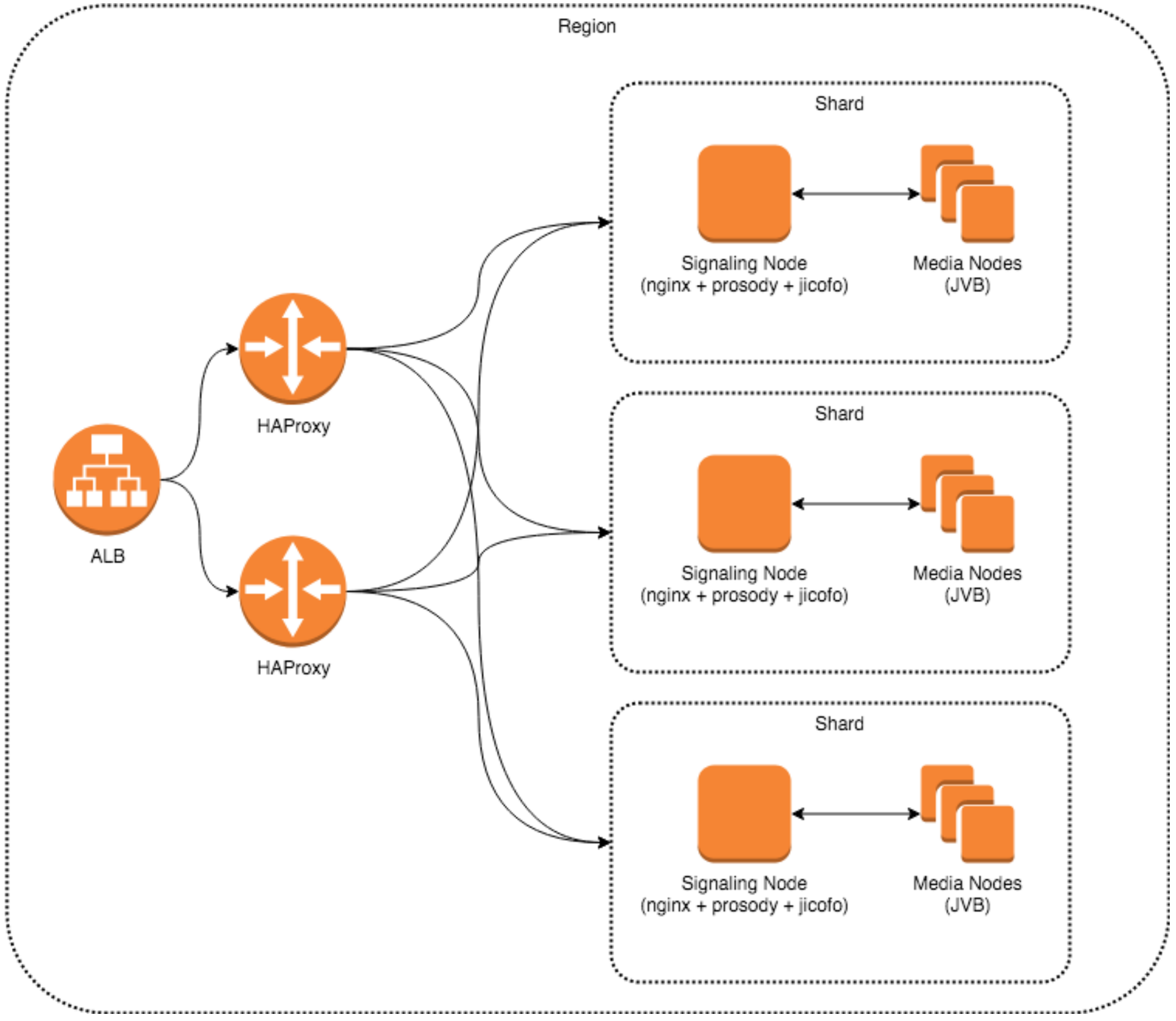


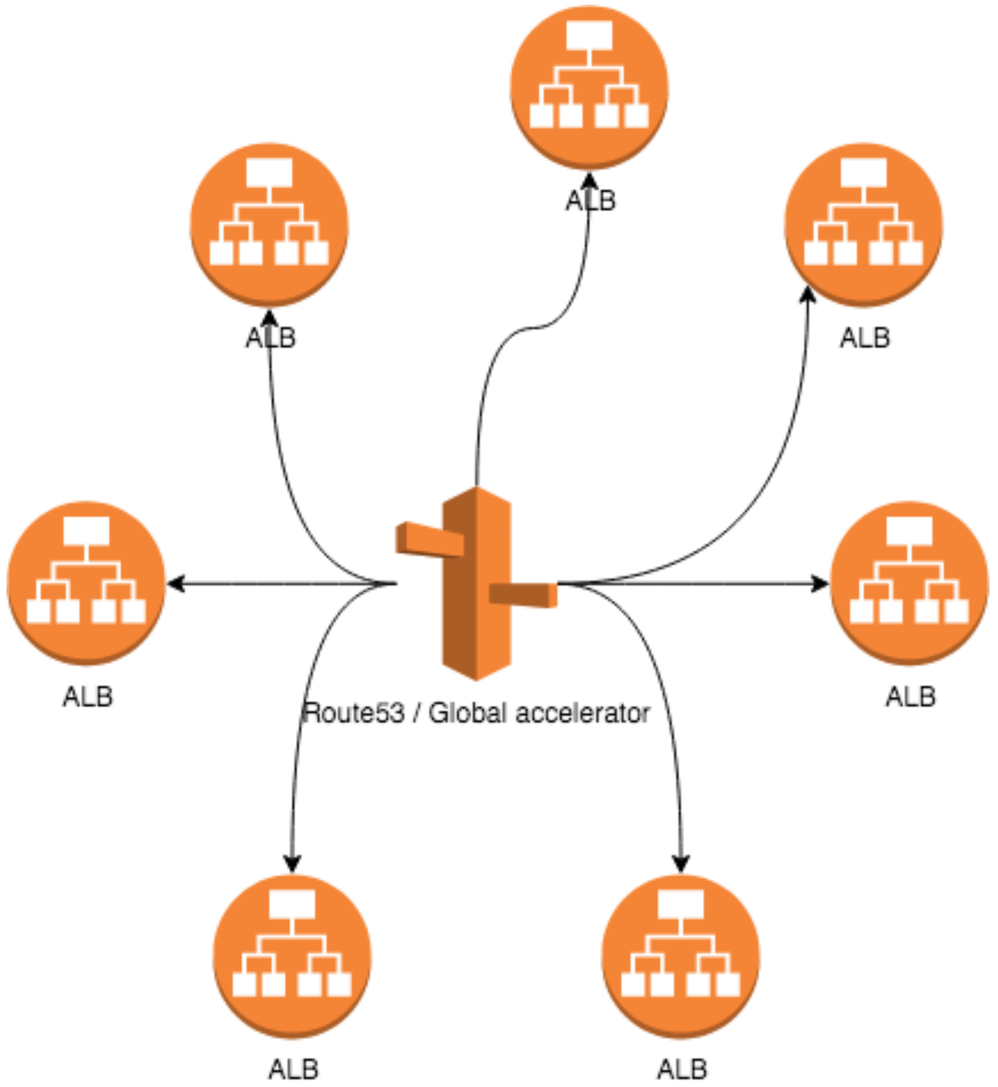

Jitsi Meet
443
10000/udp
Browser
443
10000/udp
Mobile
Web Server
Prosody
Jitsi
Videobridge
Jicofo

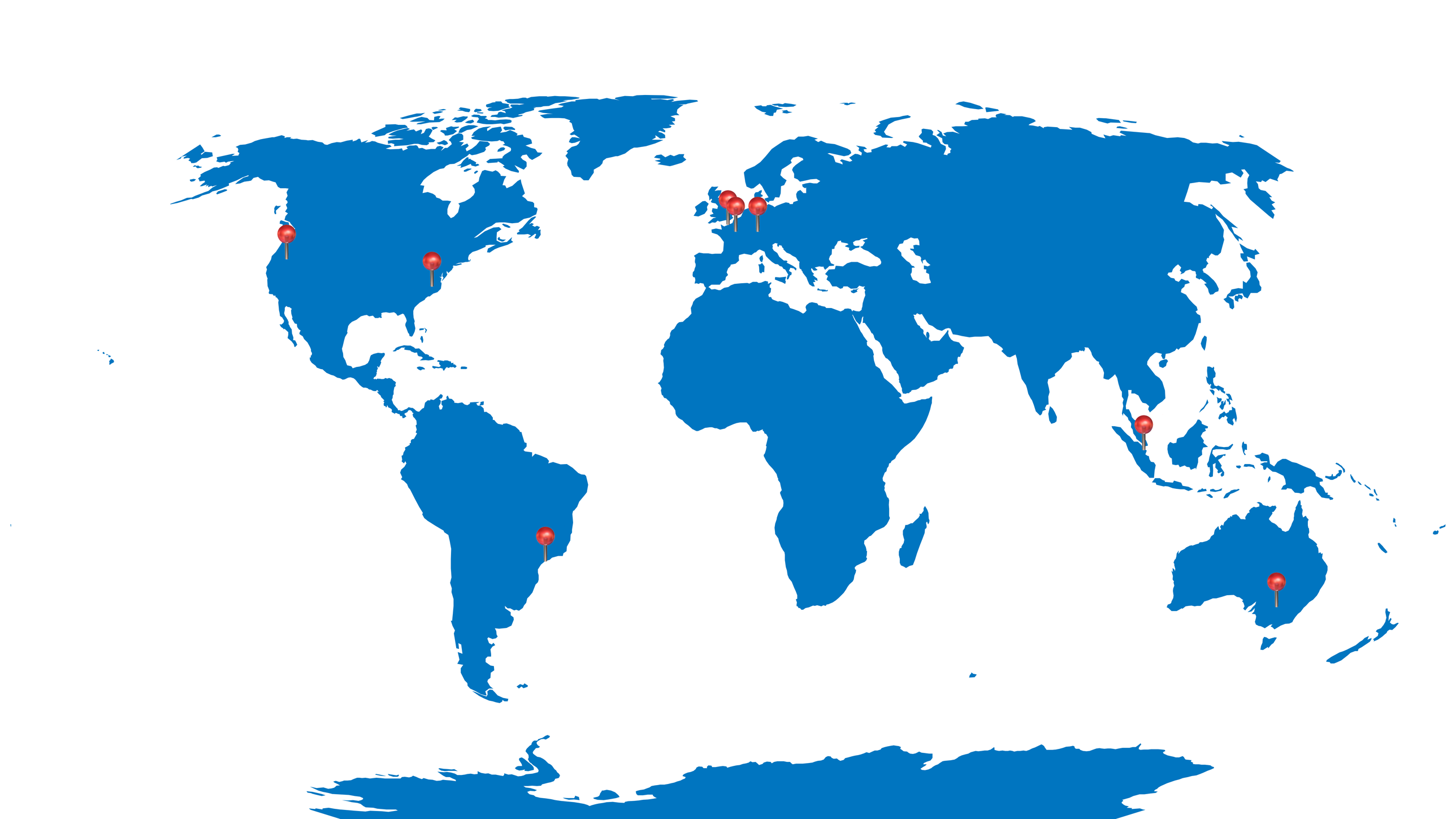
meet.jit.si

Infrastructure overview (pre-COVID19)


Shard
Signaling Node
(nginx + prosody + jicofo)
Media Nodes
(JVB)

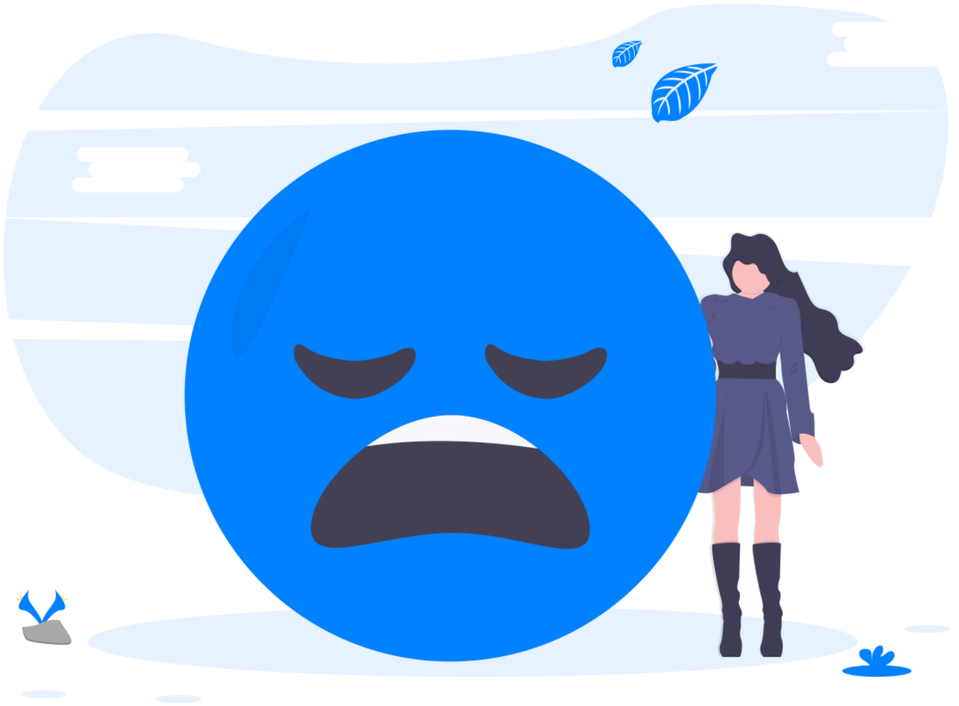

Region
Shard
Signaling Node
(nginx + prosody + jicofo)
Media Nodes
(JVB)
Shard
Signaling Node
(nginx + prosody + jicofo)
Media Nodes
(JVB)
Shard
Signaling Node
(nginx + prosody + jicofo)
Media Nodes
(JVB)
HAProxy
HAProxy
ALB


ALB
ALB
ALB
ALB
ALB
ALB
ALB
Route53 / Global accelerator



Growing pains

What broke as we scaled

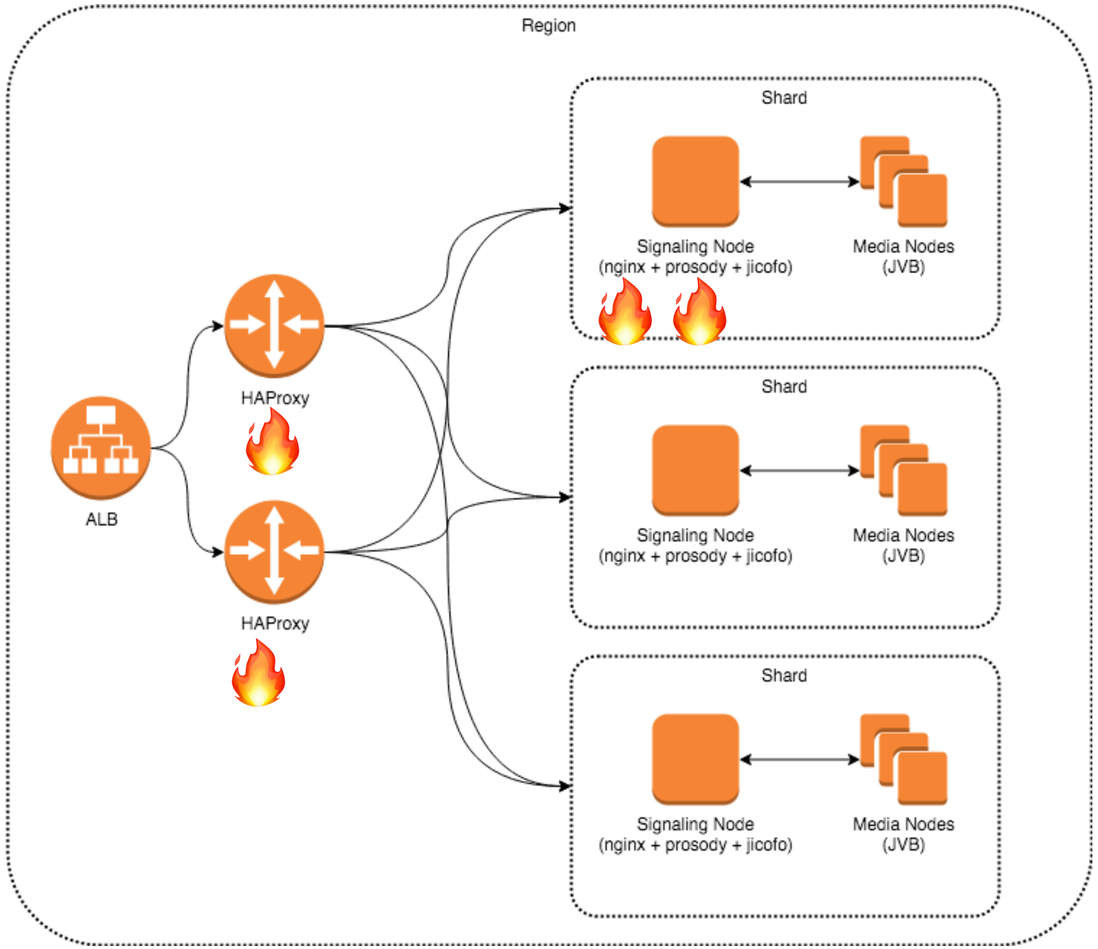


What didn’t work

We tried to be ready but the load exceeded all expectations

- Too much load on the signalling nodes resulted in 504s
- Users were “alone” in the meeting
- Mobile users couldn’t join (lots of 1 star reviews)
- First time users were not sure about how to use the tool
- Tons of forum posts
- 100s of emails

“Waterfall” failures



EMFILE

Incorrect file descriptor limits

- First affected Nginx, then Prosody
- Raise the limits!
- Reduce the number of connections, switch to WebSocket
- We ran `prlimit` in production, for real

Prosody overload

- CPU pegged at 100% — Timeouts, disconnections!
- Suboptimal custom modules
- Abuse
- Too much internal messaging in our clients / servers
- 0.11 perf improvements, shoutout to Matt and team!
- Make sure you’re using the epoll backend

OCTO

Fine tuning bridge cascading

- OCTO: scaling a meeting beyond a single bridge
- All bridges connected to all shards didn’t work, too much internal traffic
- OCTO is now enabled across all bridges of a single shard

Ephemeral port exhaustion

In the HAProxys

- Increase the number of IP address from which traffic is sent inwards
- The switch to WebSocket also helped

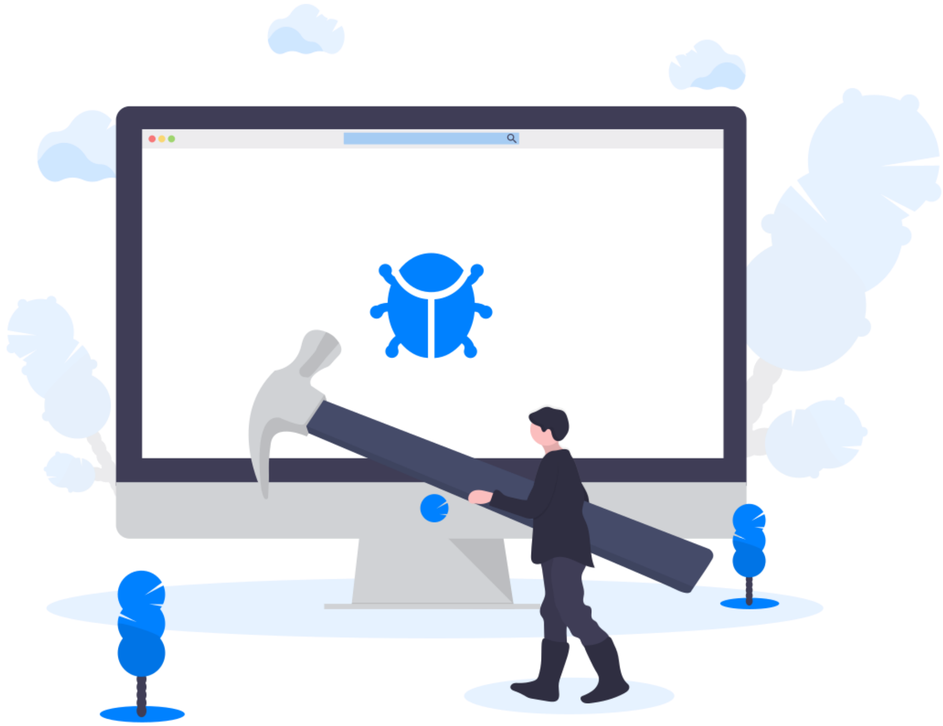
AWS Global Accelerator

- Central Europe was the busiest region (by far)
- With GA we could spread out the load to other close regions
- Also helps with region level outages

The community stepped up!

- Users helping each other in our forum
- Video guides
- Infographics
- “Word of mouth” on social media
- Myriad of instances run by many organisations and individuals

Time to fix other things

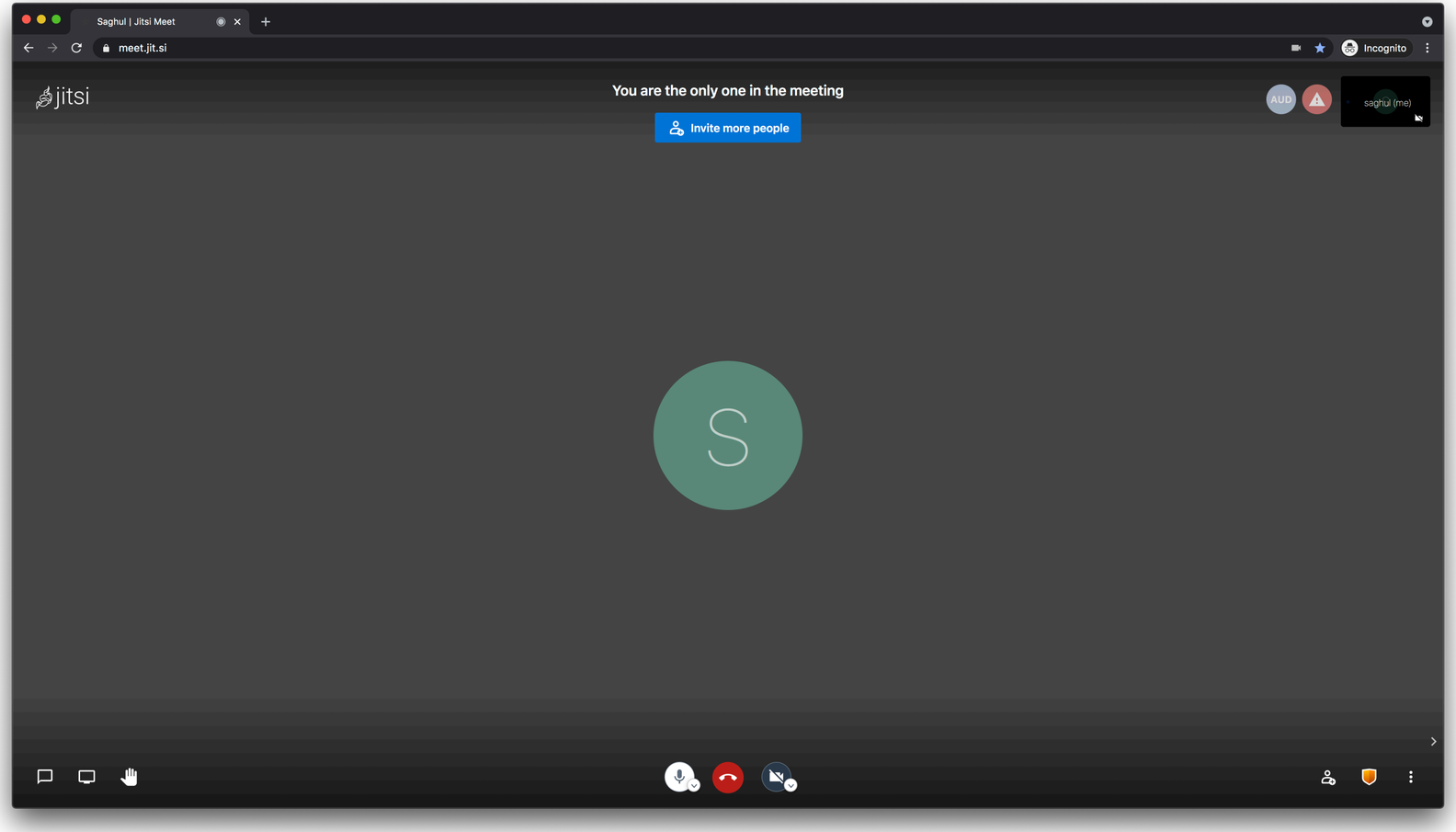


Bad UI/UX

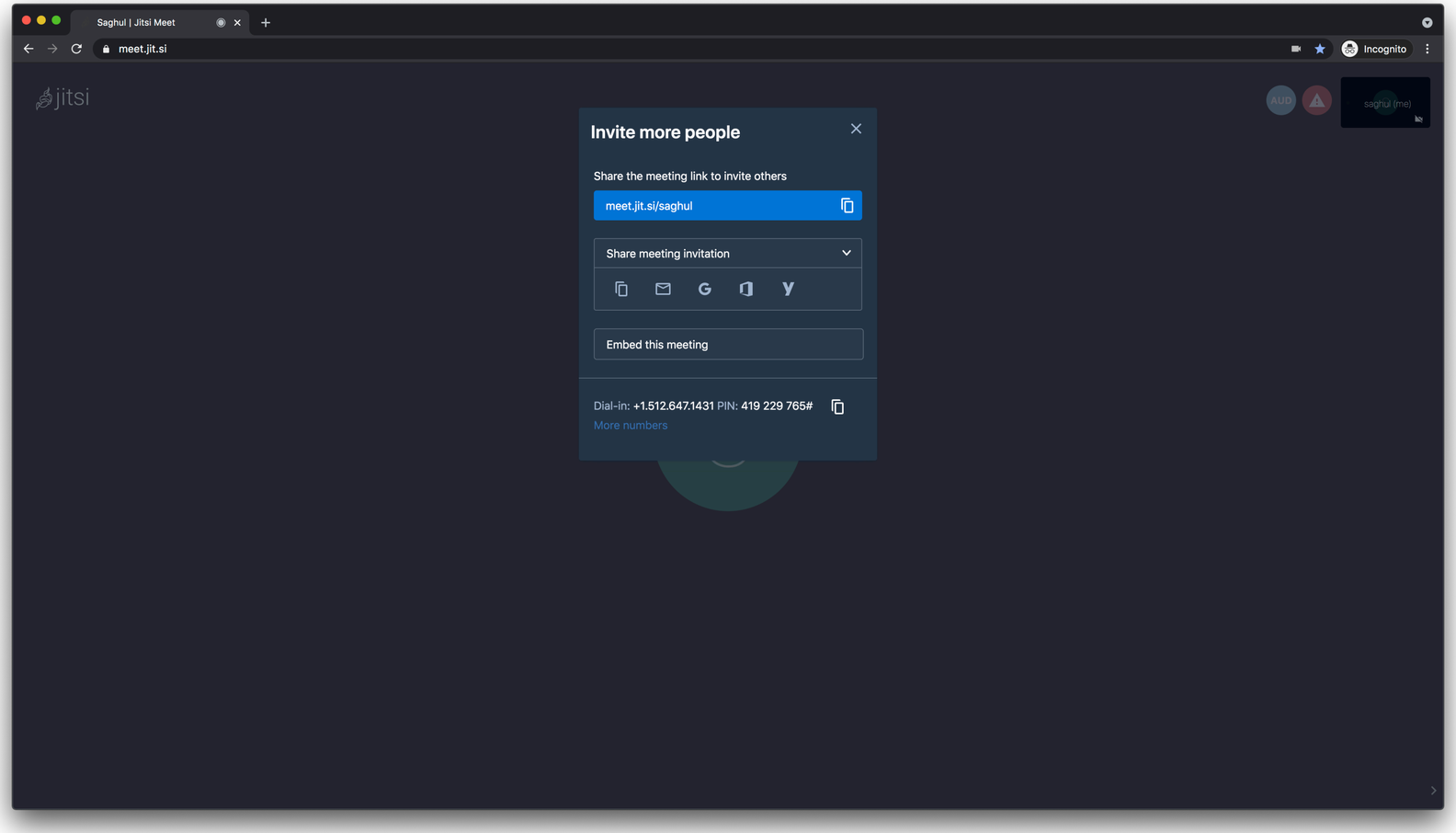
First time users were confused

- Quick indicators for inviting other participants
- New UI for inviting participants
- New UI with security options
- Improved safety measures

Improved “lonely” UX

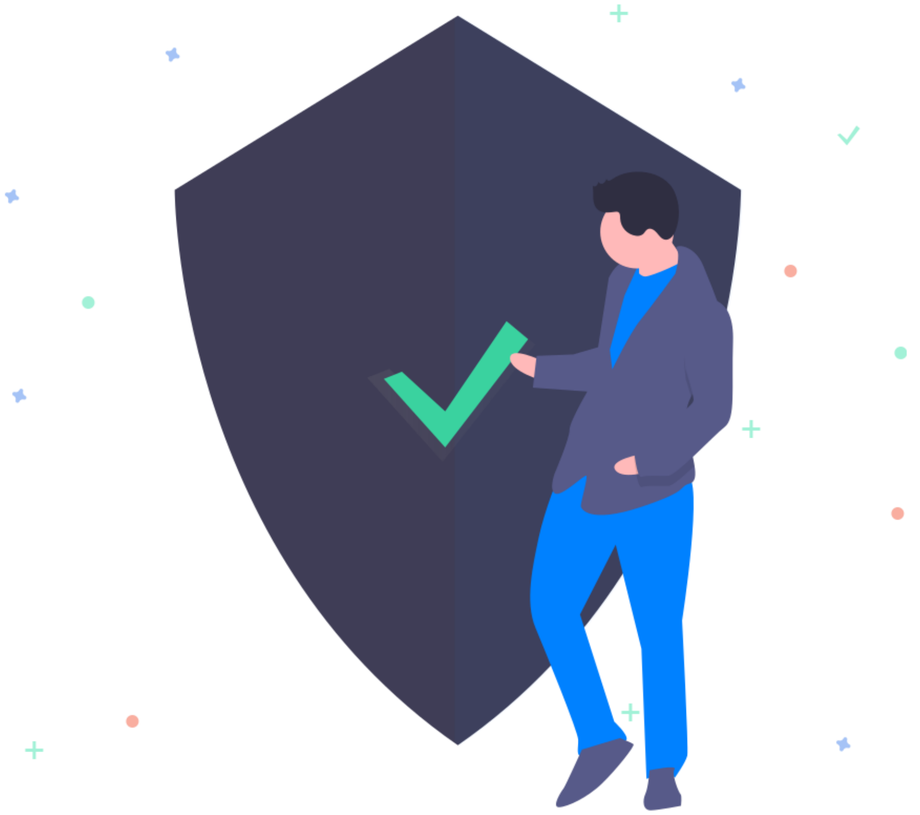


Improved invite UX

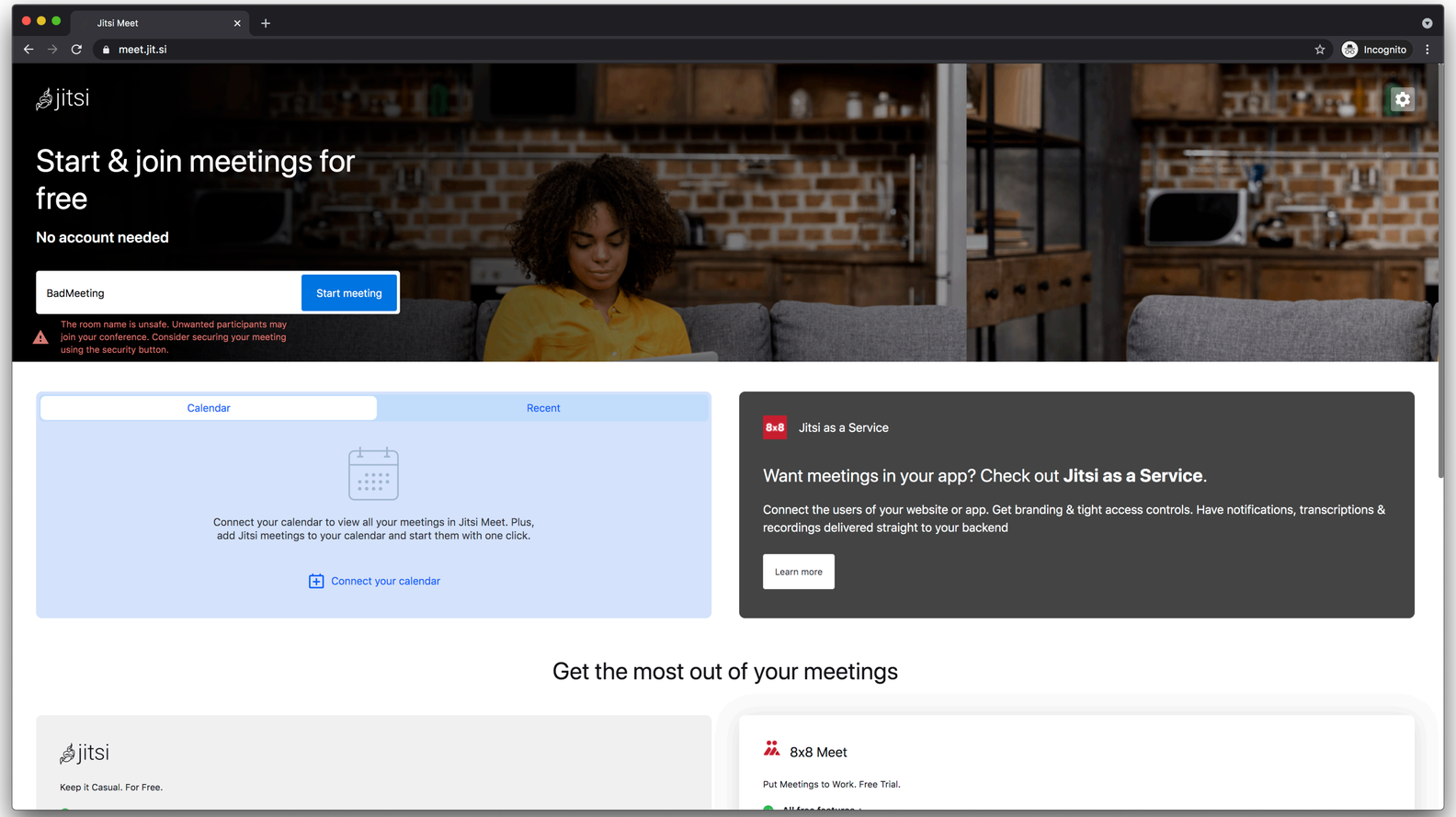


Doubling down on security and safety

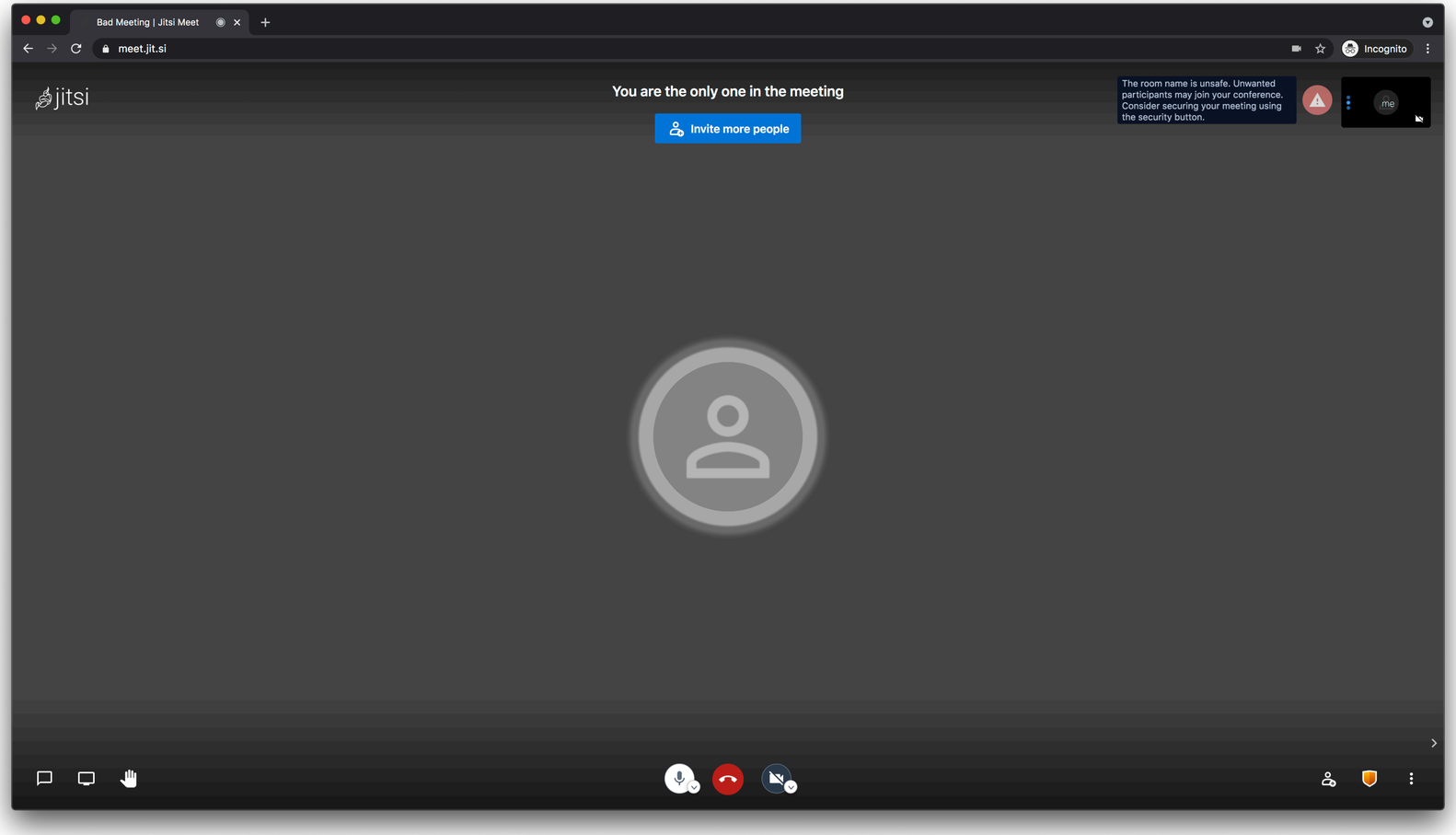
- It’s challenging fight abuse in anonymous systems
- Users want more private, safer meetings: the warnings, prejoin and lobby are our answer to that
- Checkout my End-to-End Encryption talk on the RTC track!



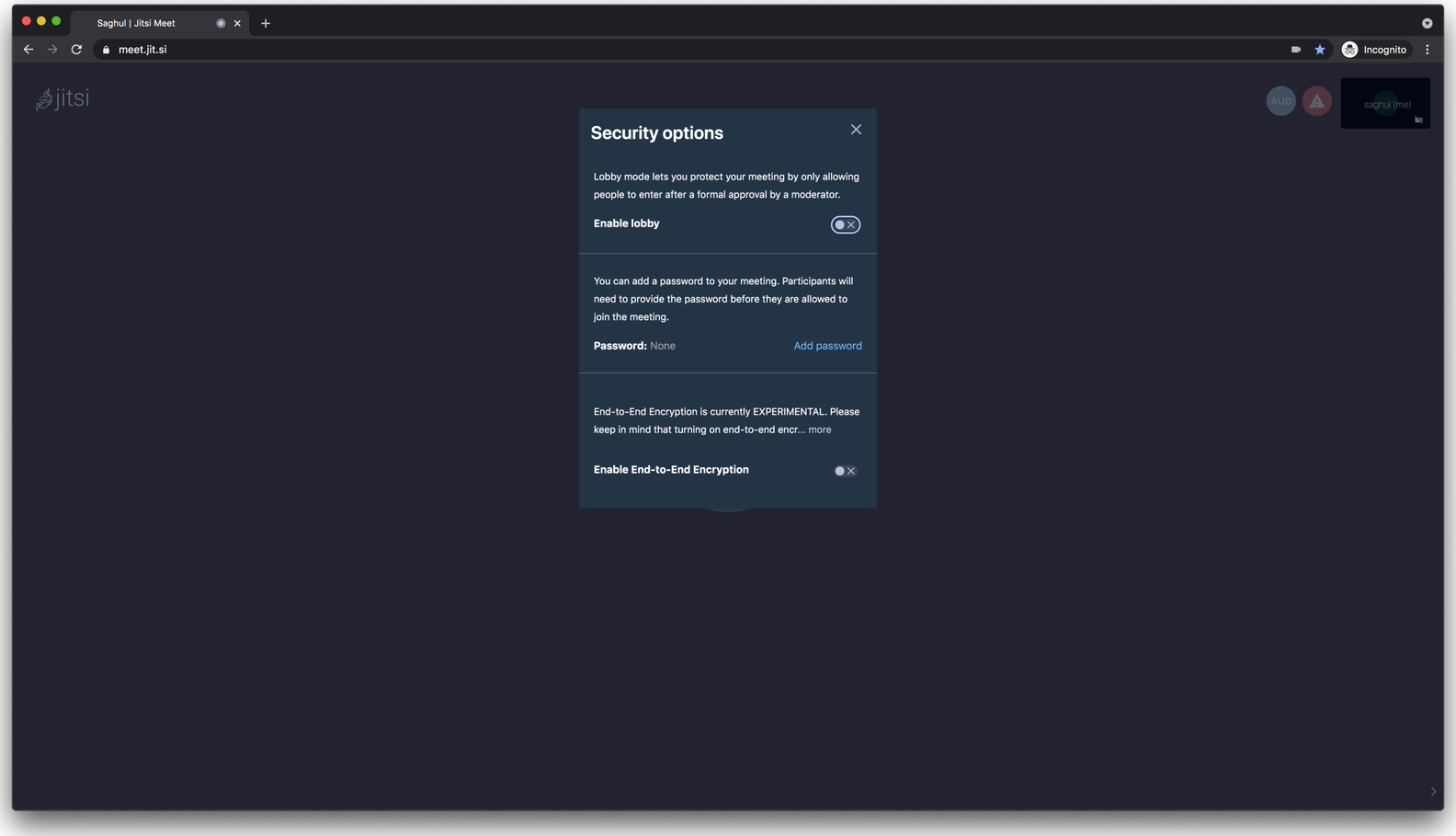
Unsafe meeting UX (I)



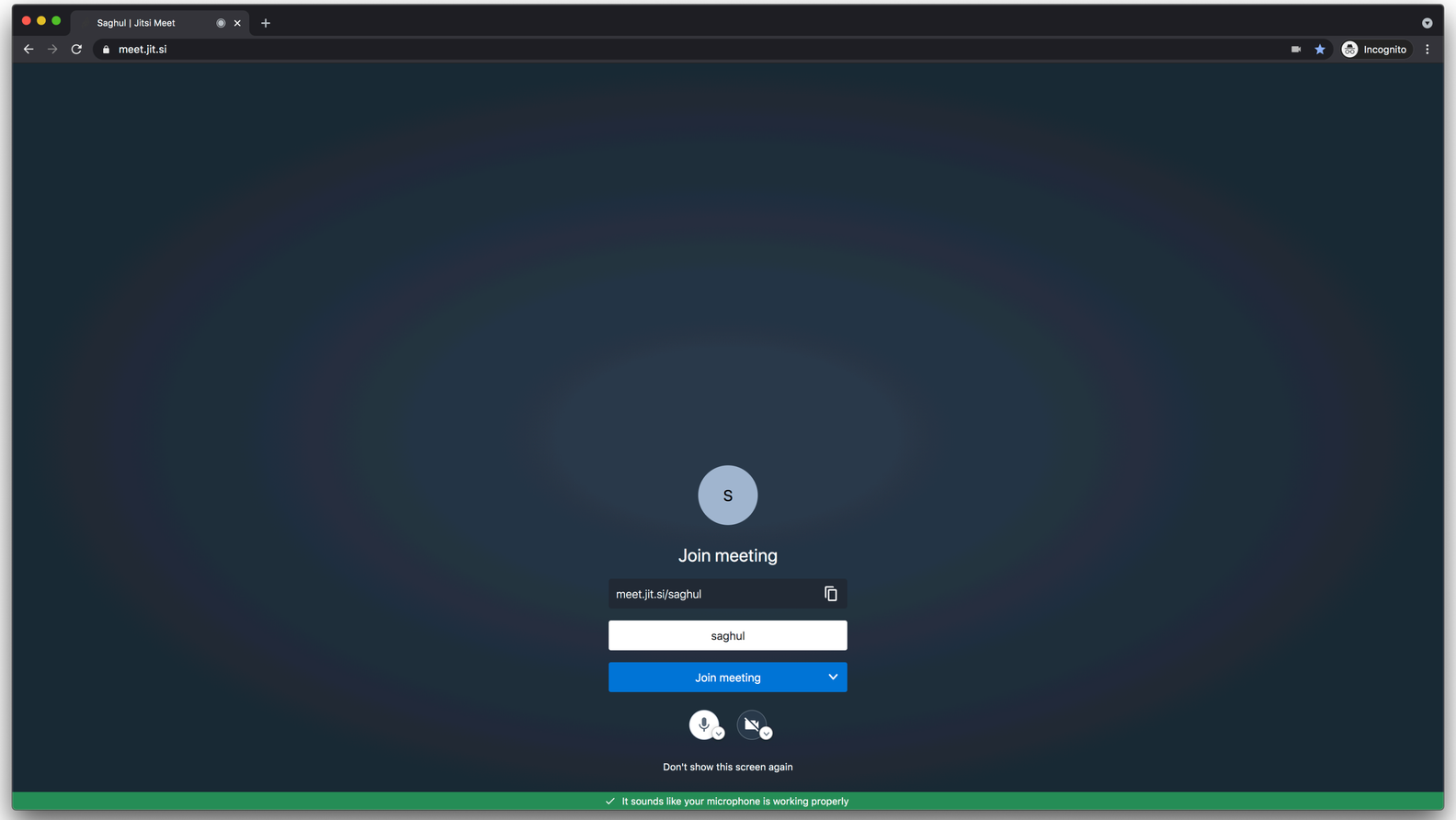
Unsafe meeting UX (II)



New security dialog



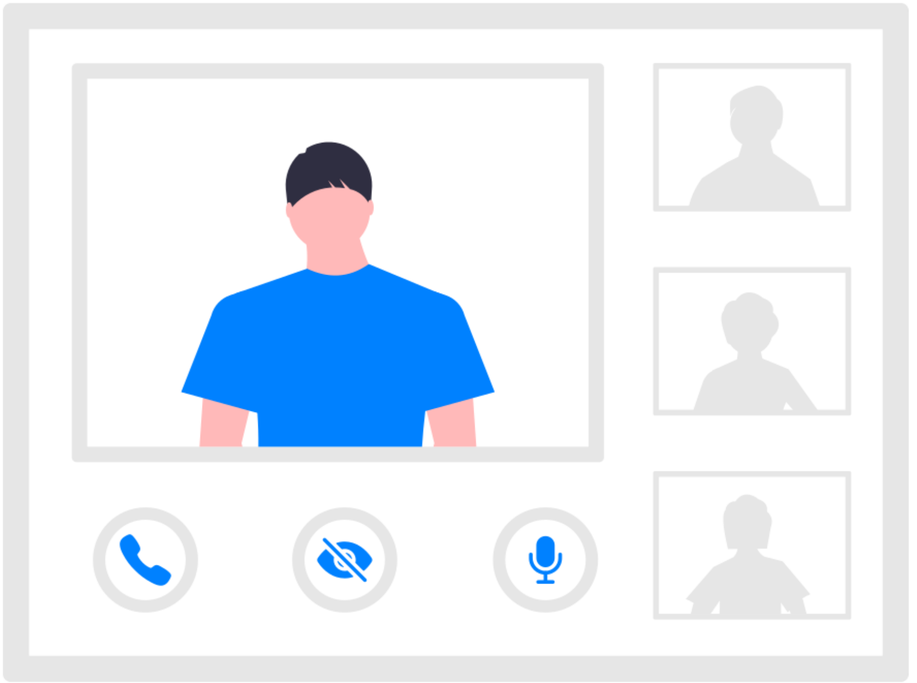
Prejoin screen



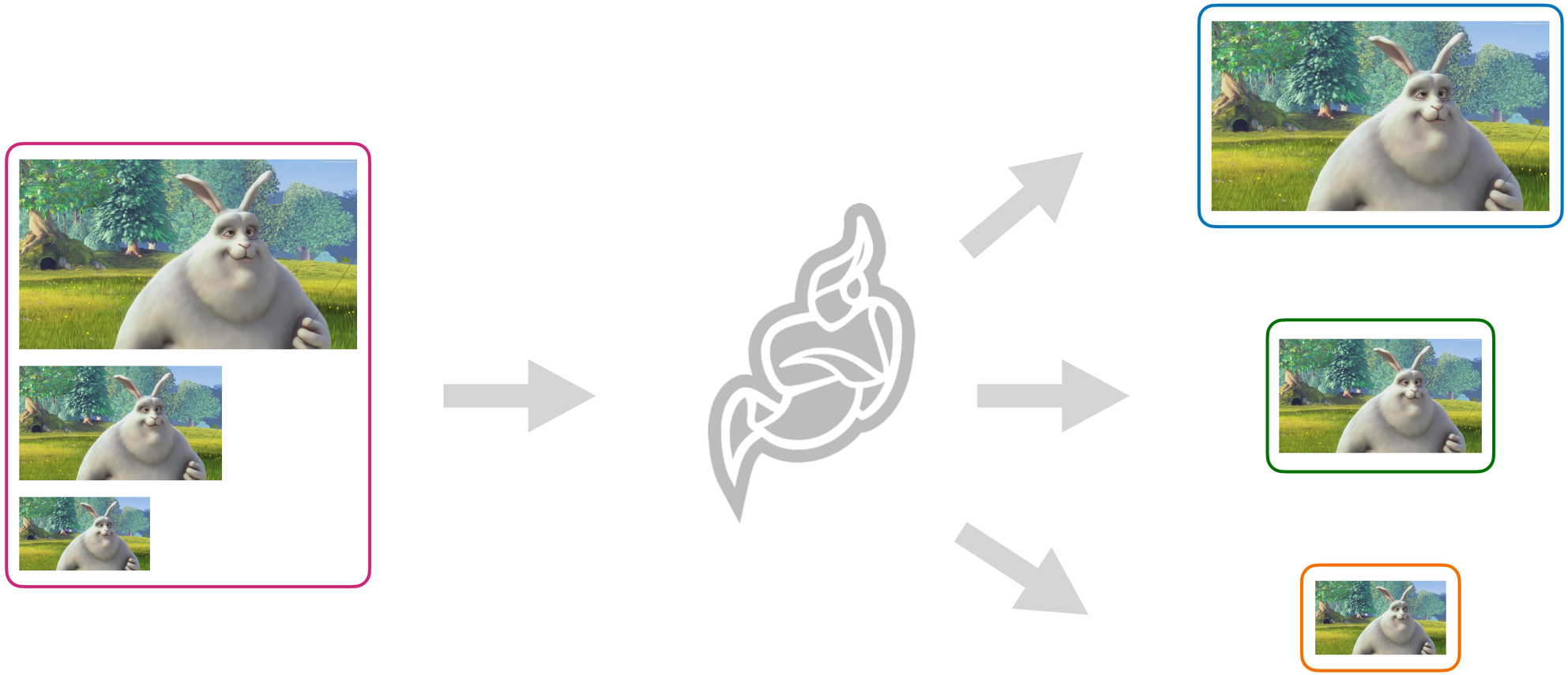
Optimizing sender video

For better CPU and bandwidth usage

- Auto tile view for > 2 participants
- Layer suspension



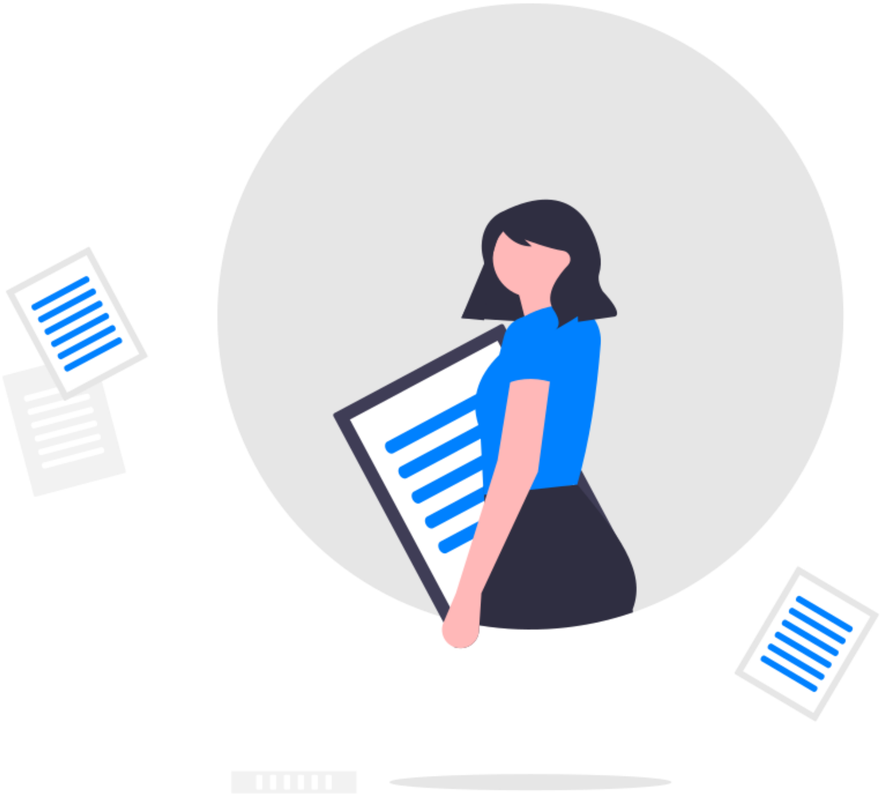
A quick simulcast primer



Documentation

We have a handbook now!

- Comprehensive guide to all of Jitsi Meet
- Lots of community contributions
- https://jitsi.github.io/handbook/



Some numbers

60x

More conferences

300x

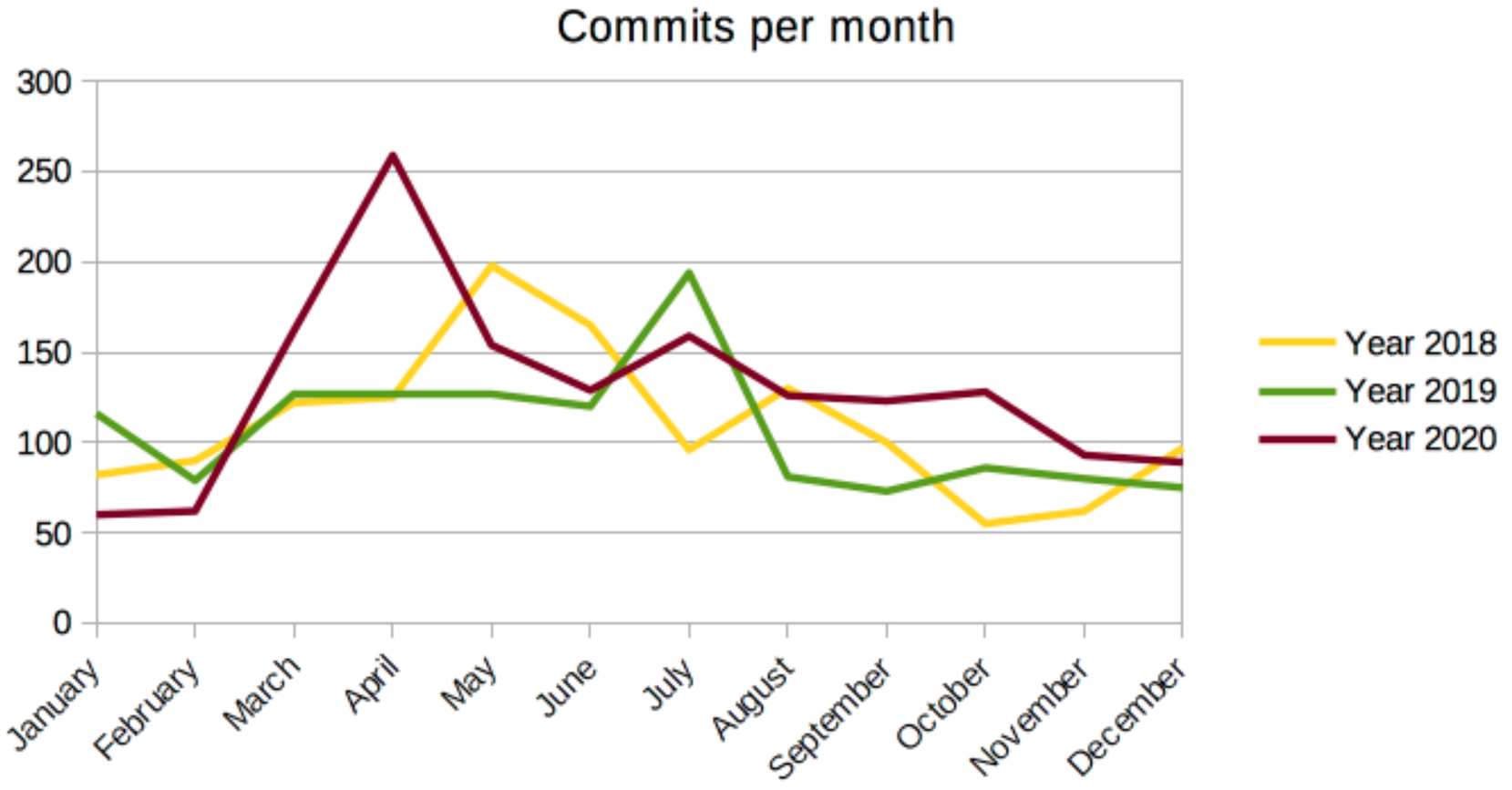
More participants

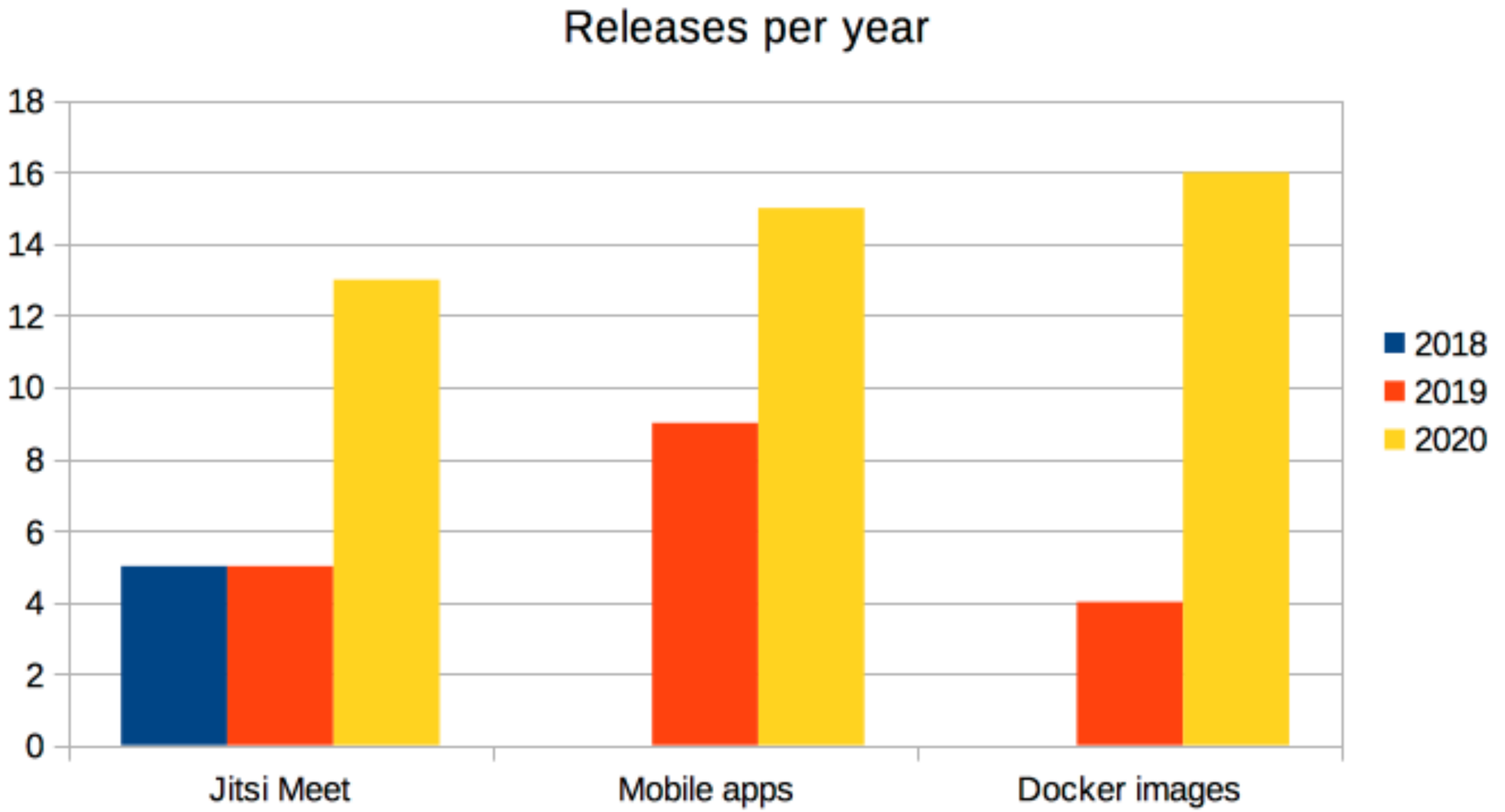
180x

More network traffic

1000s of servers

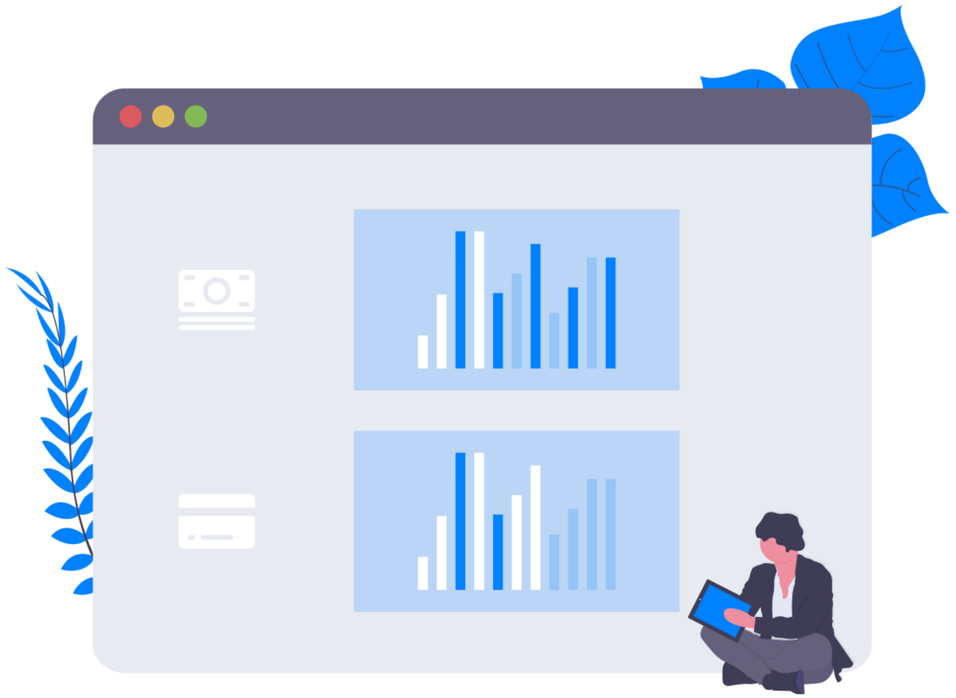
As opposed to just 10s


Commits per month
300
250
200
150
100
50
0
January
February
March
April
May
June
July
August
September
October
November
December
Year 2018
Year 2019
Year 2020


Releases per year
18
16
14
12
10
8
6
4
2
0
Jitsi Meet
Mobile apps
Docker images
2018
2019
2020

Scaling up revenue

Let’s talk about the elephant in the room



Introducing new Jitsi Meet based products

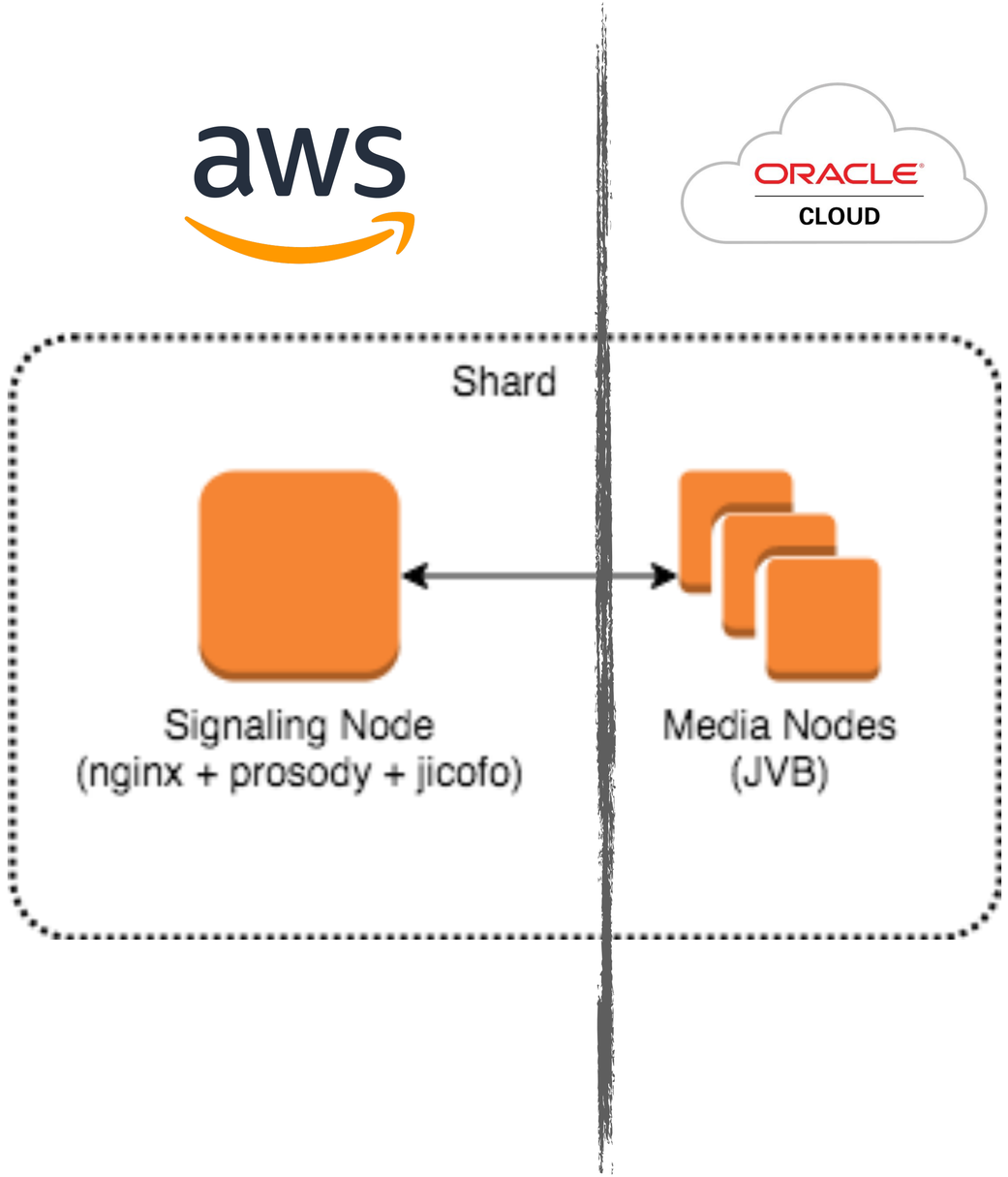
From 8x8, Inc.

- meet.jit.si — The canonical free meetings offering
- 8x8 Meet Pro — Some extra features (authentication, transcriptions, always on personal space, etc.)
- Jitsi as a Service (JaaS) — The flexibility of custom configuration without having to maintain the infrastructure yourself

- Help make the project more sustainable

meet.jit.si

Infrastructure overview (post-COVID19)


aws
ORACLE
CLOUD
Shard
Signaling Node
(nginx + prosody + jicofo)
Media Nodes
(JVB)

50% less servers

Same capacity (goal)

Thanks!

@jitsinews | @saghul