Scaling WebRTC deployments with multicast

Lorenzo Miniero
lorenzo@meetecho.com

IETF 110 – MBONED WG
March 11th
Janus

General purpose, open source WebRTC server

- https://github.com/meetecho/janus-gateway
- Demos and documentation: https://janus.conf.meetecho.com
- Community: https://groups.google.com/forum/#!forum/meetecho-janus
WebRTC-only MCU: AudioBridge plugin

https://janus.conf.meetecho.com/docs/audiobridge
WebRTC-only SFU: VideoRoom plugin

https://janus.conf.meetecho.com/docs/videoroom
Re-broadcasting RTP: Streaming plugin

https://janus.conf.meetecho.com/docs/streaming
How we handled face-to-face IETF meetings
We used multicast a lot here!
We used multicast a lot here!
... until we had to stop meeting in person

Virtual IETF meetings with WebRTC

Lorenzo Miniero
lorenzo@meetecho.com

IETF 109 – MOPS WG
November 17th

AudioBridge + RTP forwarding

Janus + AudioBridge plugin
AudioBridge + RTP forwarding
VideoRoom + RTP Forwarding

WebRTC SRTP

Janus + VideoRoom plugin

WebRTC SRTP

External Processors (e.g., Janus, FFmpeg, ...)

Plain RTP
All bricks for a “WebRTC CDN” (SOLEIL)

http://www.fedoa.unina.it/10403/1/miniero_lorenzo_27.pdf
All bricks for a “WebRTC CDN” (SOLEIL)

http://www.fedoa.unina.it/10403/1/miniero_lorenzo_27.pdf
AudioBridge + RTP forwarding + Streaming
AudioBridge + RTP forwarding + Streaming
VideoRoom + RTP forwarding + Streaming
VideoRoom + RTP forwarding + Streaming
VideoRoom + RTP forwarding + Streaming
Bringing it all together for Virtual Events
Multicast would be a perfect fit here!
Pushing it even further
Pushing it even further
Why not multicast everywhere?

- WebRTC is ubiquitous → obvious choice
  - Simple way to allow bidirectional communication in browsers
  - Supported in all major browsers, now, so very low barrier to entry
- WebRTC doesn’t support multicast, though
  - Conceived as peer-to-peer technology (servers are peers)
  - Each WebRTC PeerConnection has its own encrypted session
- There’s a bit of multicast in there anyway!
- Maybe some multicast could leveraged when broadcasting?
  - Automatic Multicast Tunneling may be helpful here
Why not multicast everywhere?

- WebRTC is ubiquitous → obvious choice
  - Simple way to allow bidirectional communication in browsers
  - Supported in all major browsers, now, so very low barrier to entry
- WebRTC doesn’t support multicast, though
  - Conceived as peer-to-peer technology (servers are peers)
  - Each WebRTC PeerConnection has its own encrypted session
- There’s a bit of multicast in there anyway!
- Maybe some multicast could leveraged when broadcasting?
  - Automatic Multicast Tunneling may be helpful here
Why not multicast everywhere?

- WebRTC is ubiquitous → obvious choice
  - Simple way to allow bidirectional communication in browsers
  - Supported in all major browsers, now, so very low barrier to entry
- WebRTC doesn’t support multicast, though
  - Conceived as peer-to-peer technology (servers are peers)
  - Each WebRTC PeerConnection has its own encrypted session
- There’s a bit of multicast in there anyway!
- Maybe some multicast could leveraged when broadcasting?
  - Automatic Multicast Tunneling may be helpful here
Why not multicast everywhere?

- WebRTC is ubiquitous → obvious choice
  - Simple way to allow bidirectional communication in browsers
  - Supported in all major browsers, now, so very low barrier to entry
- WebRTC doesn’t support multicast, though
  - Conceived as peer-to-peer technology (servers are peers)
  - Each WebRTC PeerConnection has its own encrypted session
- There’s a bit of multicast in there anyway!
- Maybe some multicast could leveraged when broadcasting?
  - Automatic Multicast Tunneling may be helpful here
Broadcasting WGs to YouTube Live
Broadcasting WGs to YouTube Live
Broadcasting WGs via AMT?
More interesting things happening @ UniNA/CINI!

Figure 1: SHINE-enabling satellite multi-link service
More interesting things happening @ UniNA/CINI!

Figure 2: Multicast overlay
Thanks! Questions? Comments?