



Librecast — Privacy and Decentralisation with Multicast

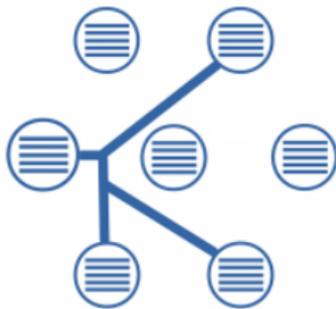
IPv6 Multicast and the Next Generation Internet

Brett Sheffield, Librecast Project

@brett_sheffield

#FOSDEM2020

Before we begin...



Librecast

Librecast

Librecast

- ▶ Developers Developers Developers

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- ▶ Messaging Library

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- ▶ Build multicast-enabled applications
- ▶ Work with FOSS projects to enable multicast everywhere
- ▶ Ensure new standards (eg. WebRTC, QUIC) support multicast

```
lc_ctx_t *ctx;  
lc_socket_t *sock;  
lc_channel_t *chan;  
lc_message_t msg;  
  
ctx = lc_ctx_new();  
sock = lc_socket_new(ctx);  
chan = lc_channel_new(ctx, channelName);  
lc_channel_bind(sock, chan);  
  
lc_msg_init_size(&msg, strlen(msgtext) - 1);  
lc_msg_send(chan, &msg);  
  
/* clean up */  
lc_socket_close(sock);  
lc_channel_free(chan);  
lc_ctx_free(ctx);
```

Multicast

"IP Multicast will play a prominent role on the Internet in the coming years. It is a requirement, not an option, if the Internet is going to scale. Multicast allows application developers to add more functionality without significantly impacting the network."

– RFC 3170, Sep 2001

Multicast

Efficient

Multicast

Scalable

Multicast

Privacy

Multicast

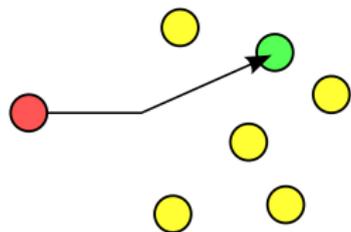
Decentralisation



What is Multicast?

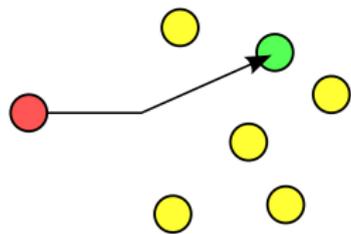
Definition

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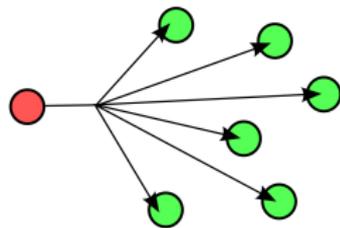


Unicast

Definition

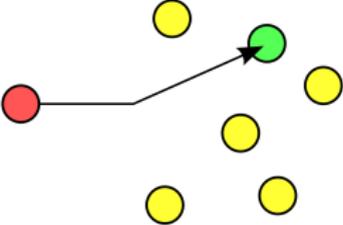


Unicast

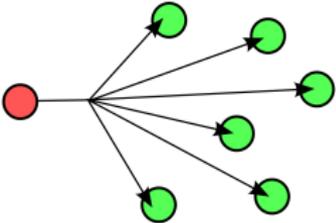


Broadcast

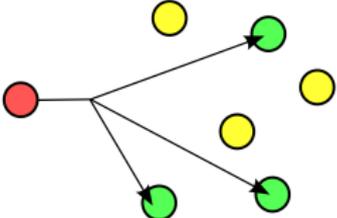
Definition



Unicast

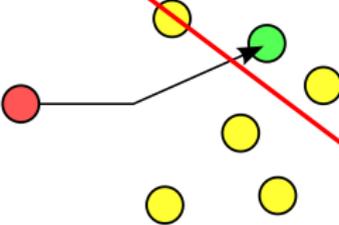


Broadcast

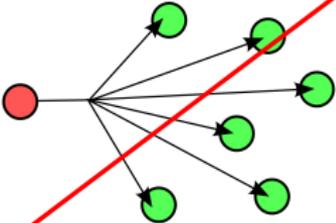


Multicast

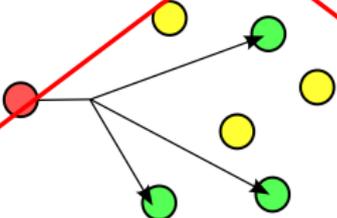
Definition



Unicast



Broadcast



Multicast

What is Multicast?

Unicast, Broadcast

Multicast

What is Multicast?

Unicast, Broadcast **PUSH**

Multicast

What is Multicast?

Unicast, Broadcast **PUSH**

Multicast **PULL**



Multicast Misconceptions

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Multicast is ...

Multicast is ...
Group Communication

All Communication is
Group Communication





The Problem with Unicast



Unicast \implies Centralized

Multicast \implies Decentralized

OSI Layer

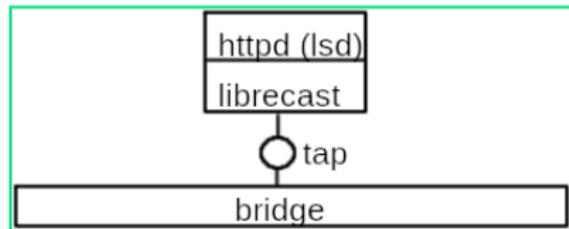
Layer		Protocol data unit (PDU)
Host layers	7 Application	Data
	6 Presentation	
	5 Session	
	4 Transport	Segment, Datagram
Media layers	3 Network	Packet
	2 Data link	Frame
	1 Physical	Symbol

Chat

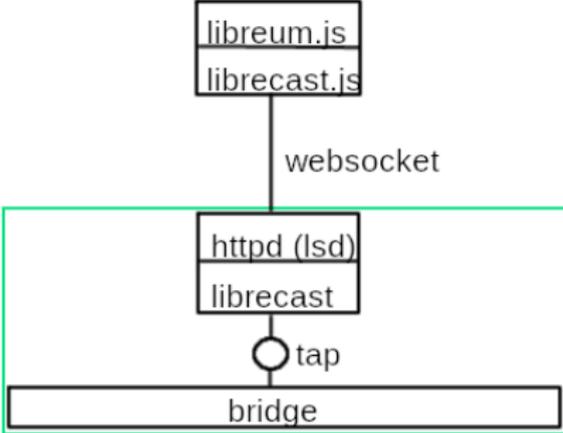
Chat Server



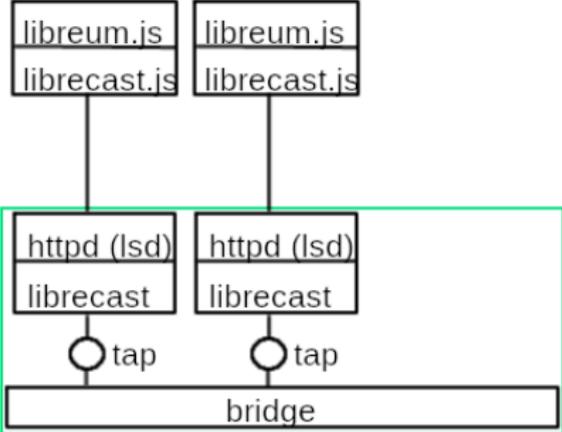
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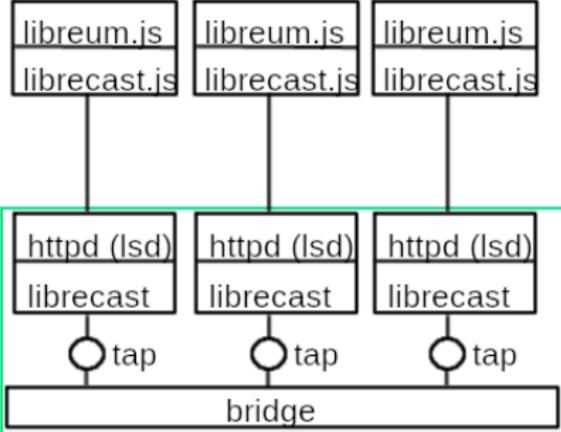
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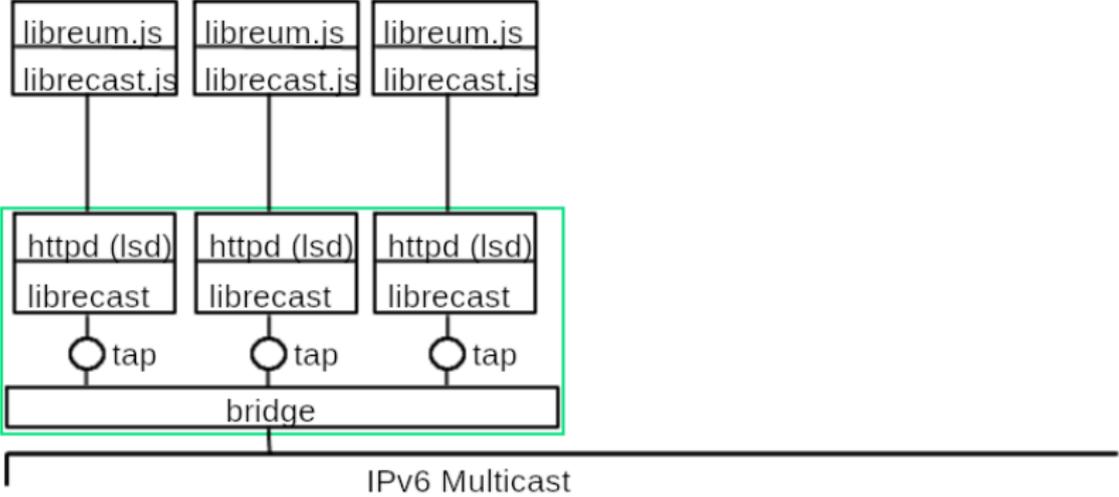
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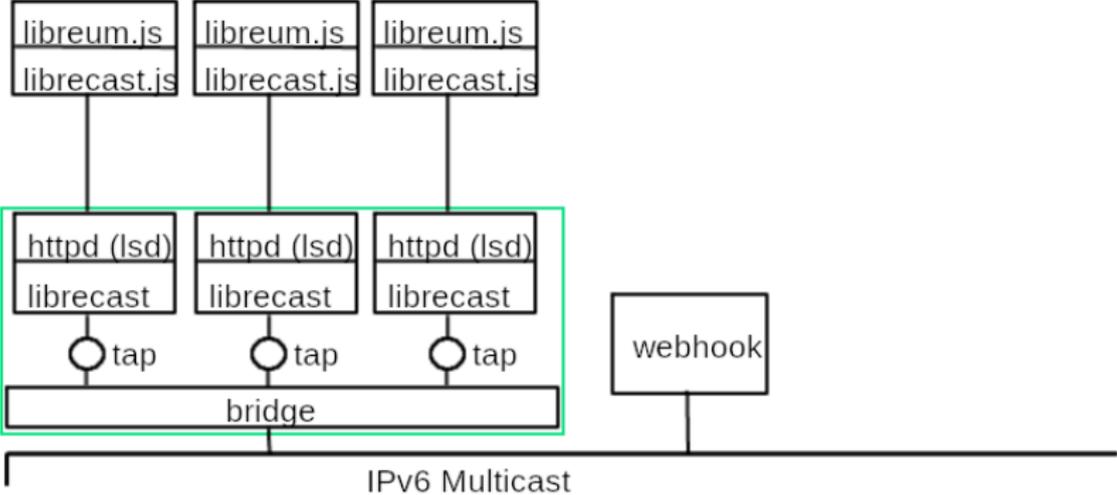
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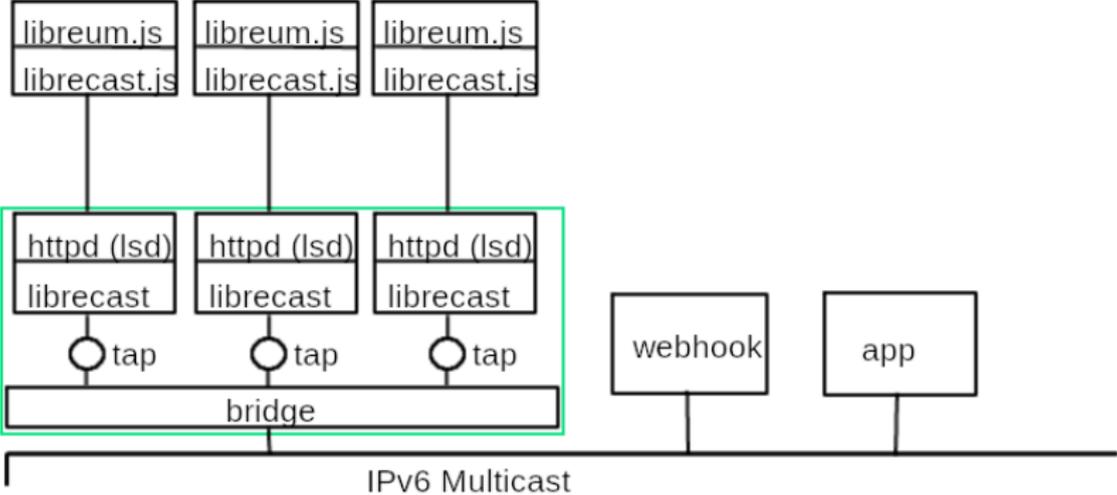
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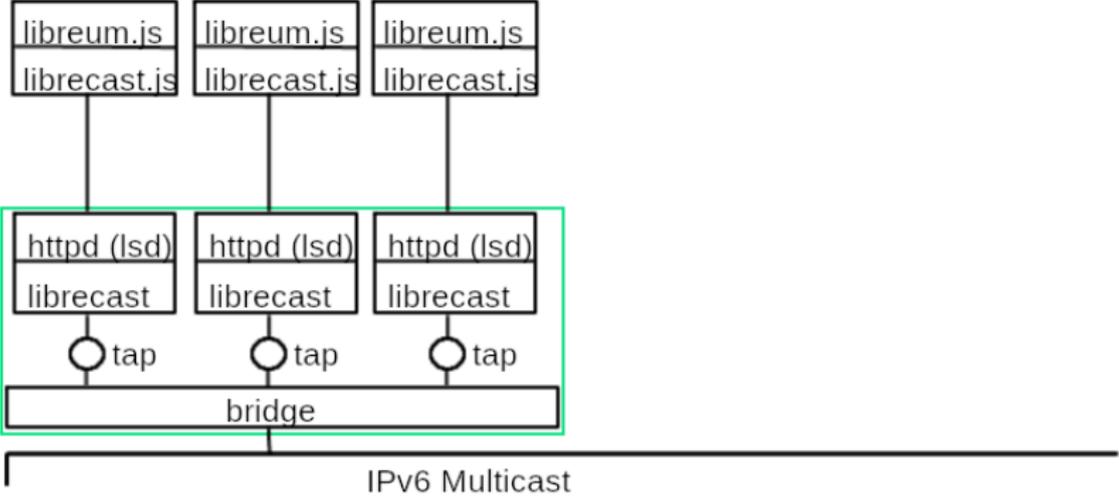
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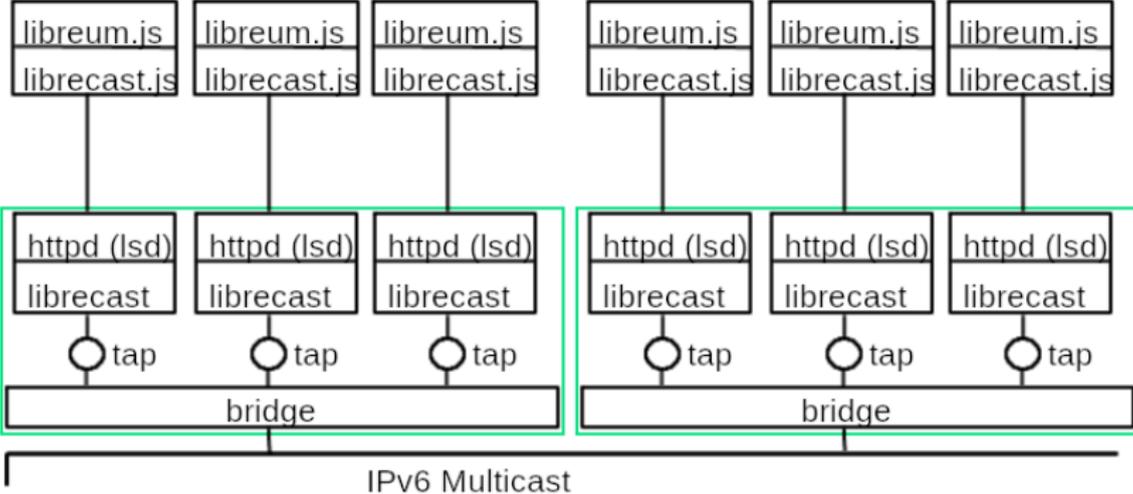
Chat Server



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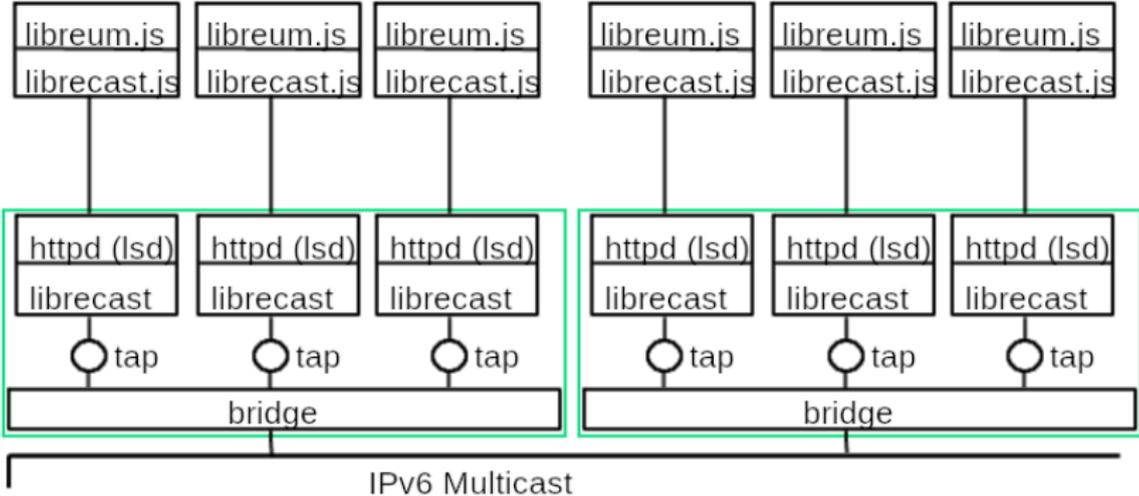
Chat Server



Chat Server

Brussels

Tokyo





IoT Updates with IPv6 Multicast

12:10 UD2.218A (Internet of Things DevRoom)

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