



SIP AND MSRP OVER WEBSOCKET

SIP and MSRP over WebSocket in Kamailio

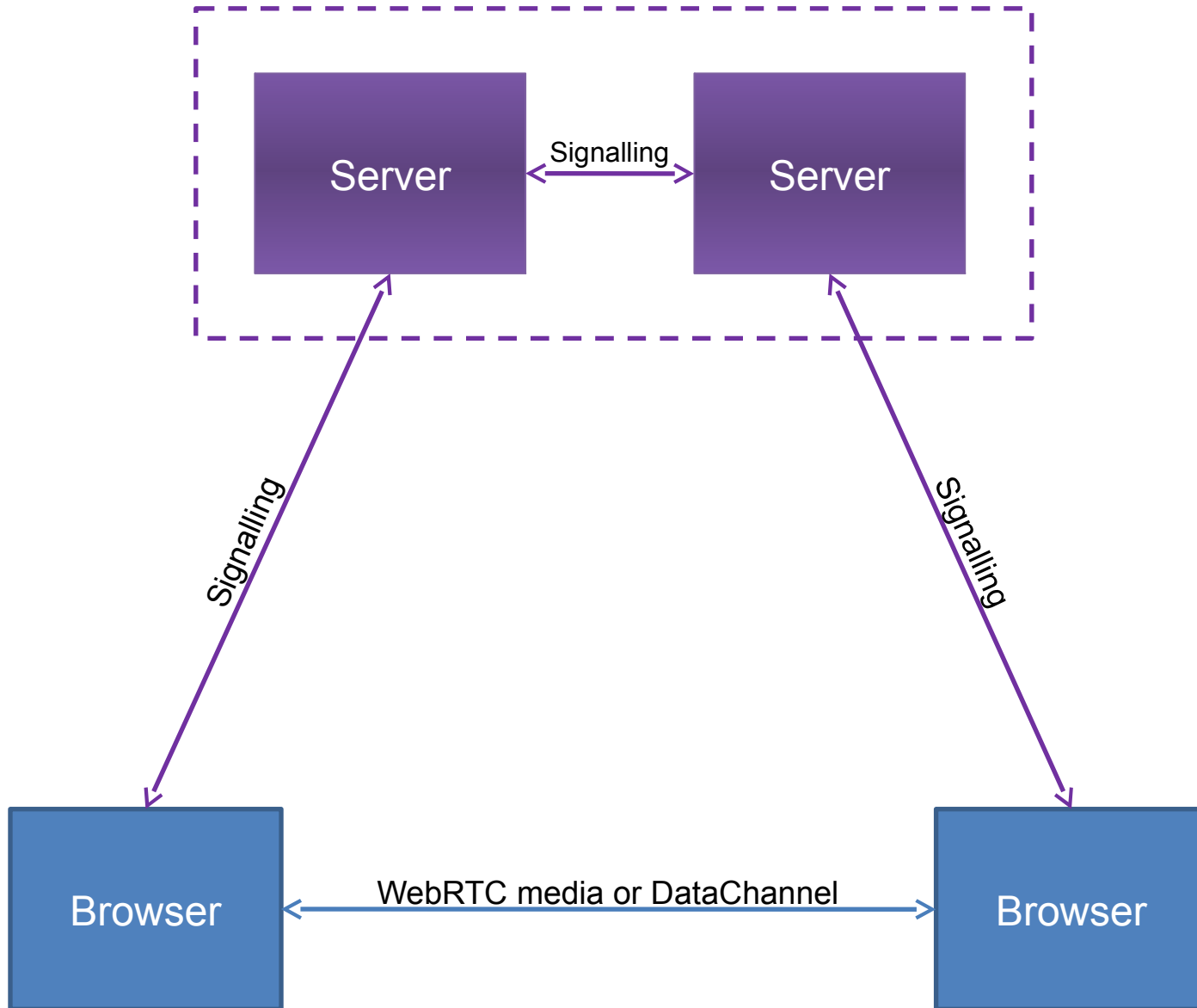
SIP and MSRP over WebSocket in Kamailio

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What is WebRTC?

- WebRTC is about media
 - PeerConnection, GetUserMedia, MediaStreams, and DataChannel
 - SDP
 - RTP/SAVPF
 - ICE
 - Codecs (G.711, OPUS, H.264 vs VP8)
- It doesn't help with the signalling part of the trapezoid/triangle

The trapezoid/triangle

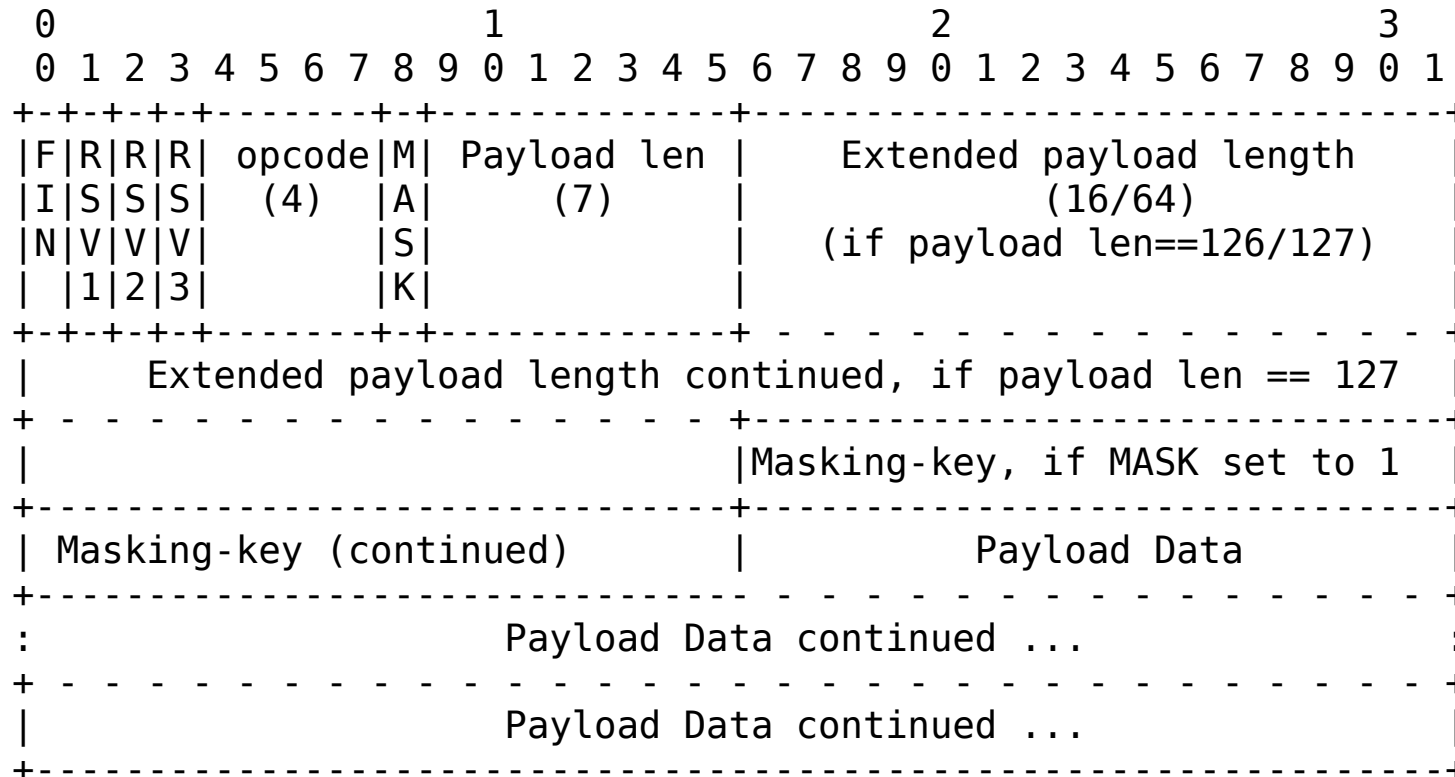


What is WebSocket?

- Safe, client-originated, connection to servers
- Often used from web-browsers - but does not have to be
- It is an asynchronous protocol
- Traffic from the client is masked
- Although carried over TCP WebSocket is a frame based protocol
- RFC 6455, “The WebSocket Protocol”

WebSocket framing

- RFC 6455, section 5.2



SIP over WebSocket (draft-ietf-sipcore-sip-websocket)

- Why use SIP?
 - It's the “Session Initiation Protocol”
 - Islands are good but you don't want to be marooned
 - Many regulatory issues already dealt with
 - Billing
 - CALEA/LI
 - Privacy
 - It's taken almost 10 years to sort out the SIP issues. Why start from scratch and make the same mistakes all over again?

SIP over WebSocket (draft-ietf-sipcore-sip-websocket)

- WebSocket has limitations
 - You can't know your local IP address
- Use SIP Outbound (RFC 5626)
 - Sorts out NAT traversal issues
 - Separates Edge Proxy (client connection and network protection) from Registrar and dynamic routing logic
 - SIP Outbound uses GRUU (RFC 5627) to identify User Agents and Path (RFC 3327) to enable clients to use Registrars that are not their first-hop

SIP over WebSocket (draft-ietf-sipcore-sip-websocket)

- Open-source server implementations
 - Asterisk, Kamailio, OverSIP, reSIProcate
- Open-source client implementations
 - JAIN SIP JavaScript
 - JsSIP
 - QoffeeSIP
 - sipML5

MSRP over WebSocket (draft-pd-dispatch-msrp-websocket)

- Why use MSRP over WebSocket?
 - It's a natural companion to SIP
 - Can be used for IM, file transfer, or any other data streaming you need
- WebSocket limitations
 - Same as SIP
- Use an MSRP Relay (RFC 4976)
 - Sorts out NAT traversal issues

MSRP over WebSocket (draft-pd-dispatch-msrp-websocket)

- Open-source server implementations
 - Kamailio
- Open-source client implementations
 - Crocodile MSRP

Kamailio support

- The following modules enable you to use SIP and MSRP over WebSocket in Kamailio
 - websocket
 - msrp
 - nathelper or outbound
- nathelper based example configuration is in the source tree “examples/websocket.cfg”
- outbound based example configuration TBD

Kamailio configuration

- Handle WebSocket handshake using `event_route[xhttp:request]`

```
event_route[xhttp:request] {
    set_reply_close();
    set_reply_no_connect();

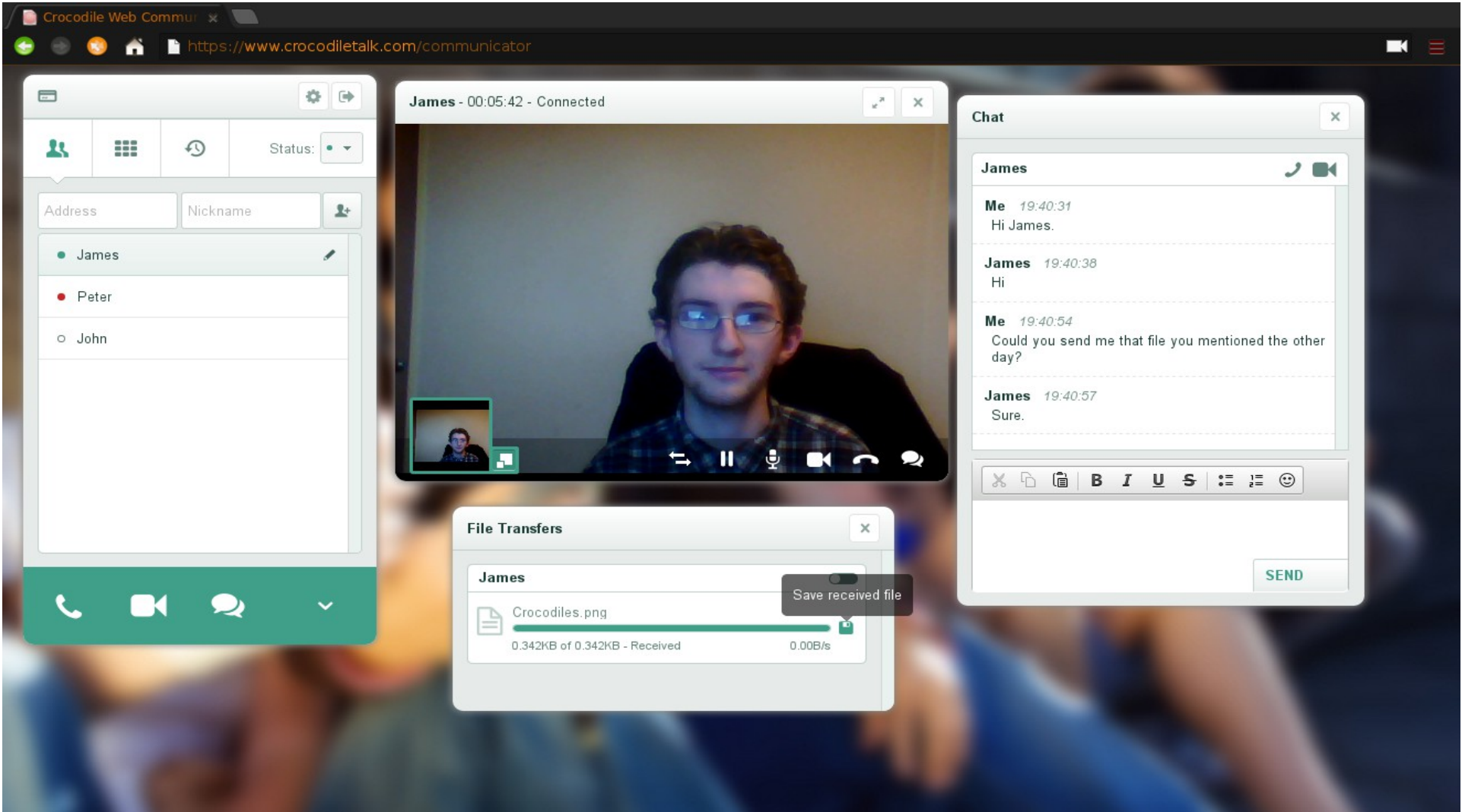
    if ($hdr(Upgrade)=~"websocket"
        && $hdr(Connection)=~"Upgrade"
        && $rm=~"GET") {

        # Validate as required (Host:, Origin:, Cookie:) and perform
        # HTTP authentication if required

        if (ws_handle_handshake())
            exit;
    }

    xhttp_reply("404", "Not Found", "", "");
}
```

Demo



The demo is built on the Crocodile SDK

- Open source Javascript library for real-time communication
- Web API for provisioning and third-party website integration
- Free-to-use SIP and MSRP network

Crocodile Javascript library example

```
<html>
<script src="http://www.example.com/jquery.crocsdk.js"></script>
<script>
$(document).ready(function(){
  var croc = $.croc({
    apiKey: "ldsksu21#4598-21wks8=",
  });

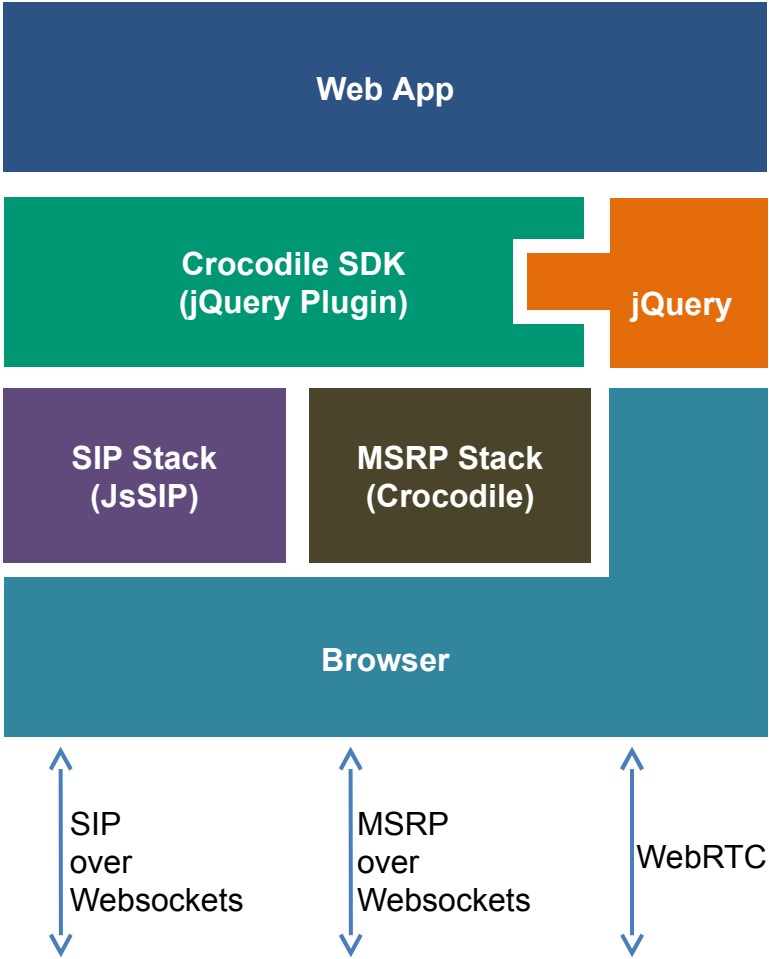
  var session = croc.media.connect("sip:bob@example.com");
  session.remoteAudioElement = $('#audio');
})
</script>

<body>
  <audio id="audio" />
</body>
</html>
```


Crocodile Javascript library components

- JsSIP (Javascript stack)
 - Best-of-breed
 - Easily to extend (good object model)
- Crocodile MSRP Client (Javascript stack)
 - Similar object model to JsSIP
 - Known to work with JsSIP (with JsSIP.Session overridden)

Crocodile Javascript library architecture



Crocodile network

- Cloud based (Amazon EC2)
- Kamailio core
 - SIP Outbound Edge Proxy (SIP over WebSocket)
 - SIP Proxy/Registrar
 - MSRP Relay (MSRP over WebSocket)
- Other open-source platforms used for
 - STUN/TURN servers
 - Accounting/Billing
 - Media gateway

Network and SDK Launch on 22 May 2013

- Launch event at Google Campus, London





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