SIP and MSRP over WebSocket in Kamailio

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But first...

- Daniel-Constantin Mierla (@miconda) on what is new 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

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The Trapezoid/Triangle
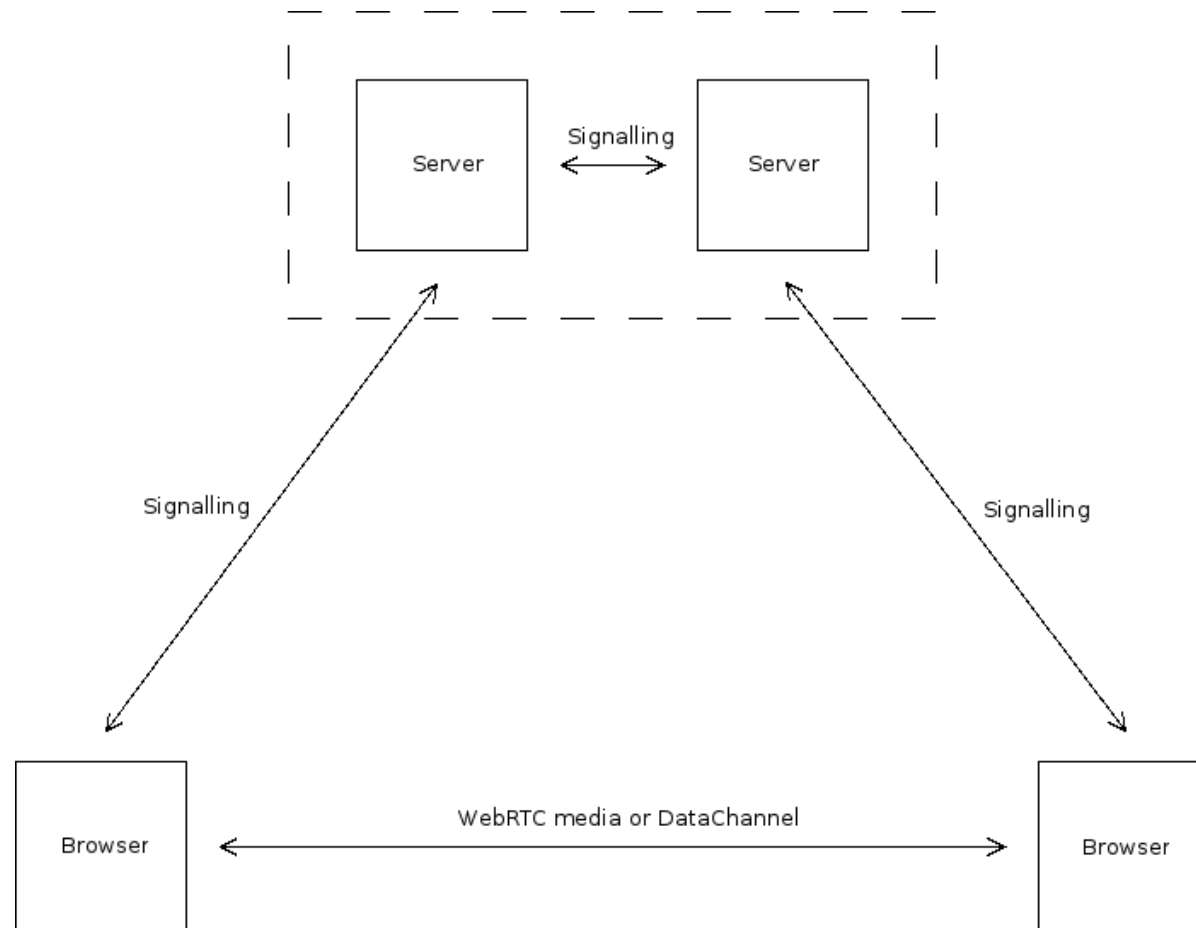
What is WebSocket?

- 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"

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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?

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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

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

- Open-source server implementations
  - Asterisk, Kamailio, OverSIP
  - Resiprocate (with Doubango patch)
- Open-source client implementations
  - JAIN SIP JavaScript
  - JsSIP
  - QoffeeSIP
  - sipML5

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

- Why use MSRP?

    - It's a natural companion to SIP

    - DataChannel can only be used with other WebRTC end-points (unlike the MediaStream which is <u>almost</u> compatible)

   - Can be used for IM, file transfer, or any other data streaming you need

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

- **WebSocket limitations**

  – Same as SIP

- **Use an MSRP Relay (RFC 4976)**

  – Sorts out NAT traversal issues

  – Enables authorisation of traffic

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

- Open-source server implementations

  – Kamailio

- Open-source client implementations

  – Crocodile MSRP

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Demo
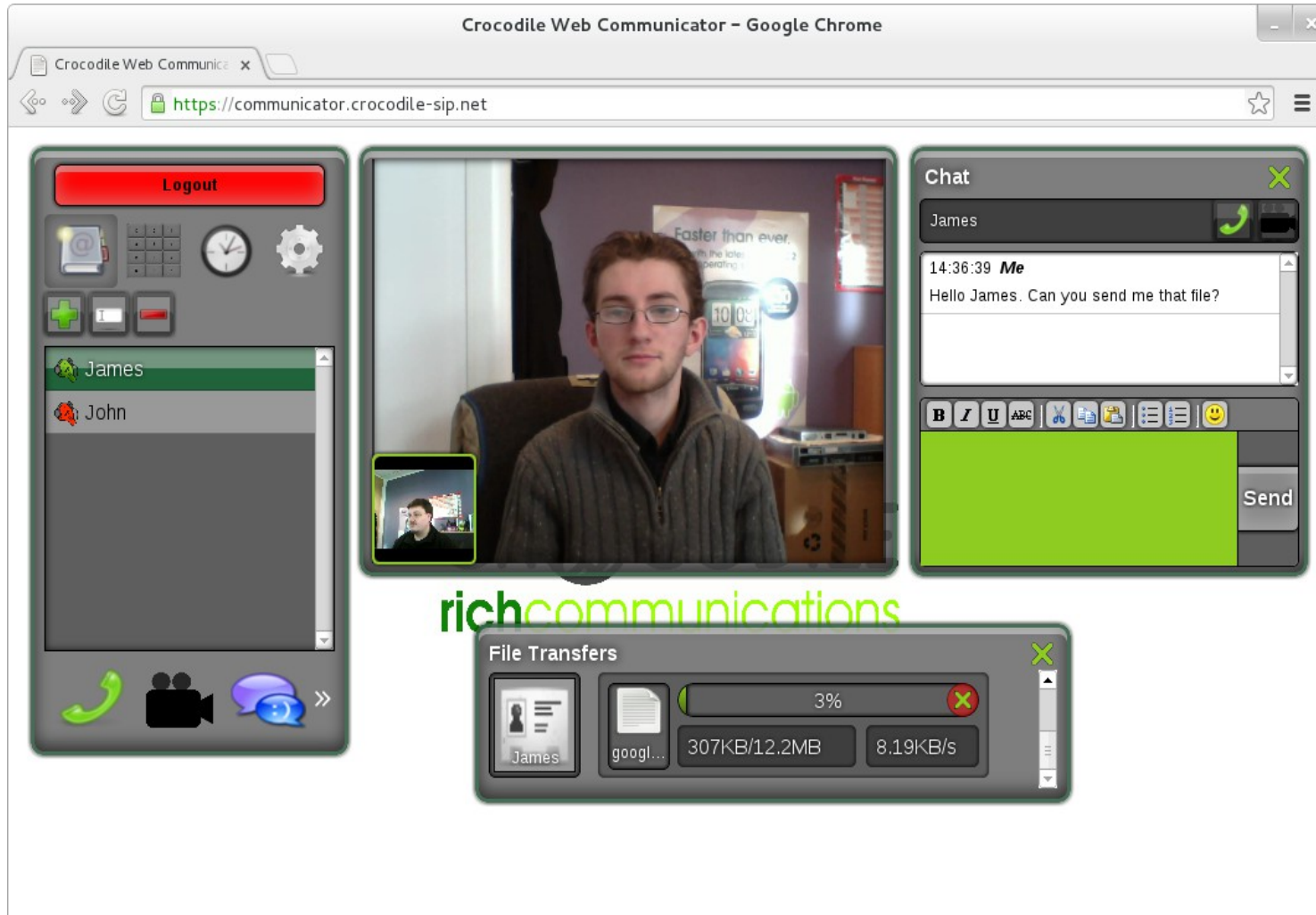
Crocodile SDK Principles

- Basic real-time communications should be trivial

- Web-developers shouldn't have to understand real-time communications or SIP

- Being easy for web-developers shouldn't mean advanced things aren't possible

- Being easy for web-developers shouldn't mean interworking isn't possible

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Crocodile SDK (simple example)

```html
<html>
<script src="http://www.example.com/jquery.crocsdk.js"></script>
<script>
$(document).ready(function(){
  var croc = $.croc({
    apiKey: "1dsku21#4598-21wks8=",
  });


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

<body>
  <audio id="audio" />
</body>
</html>
```
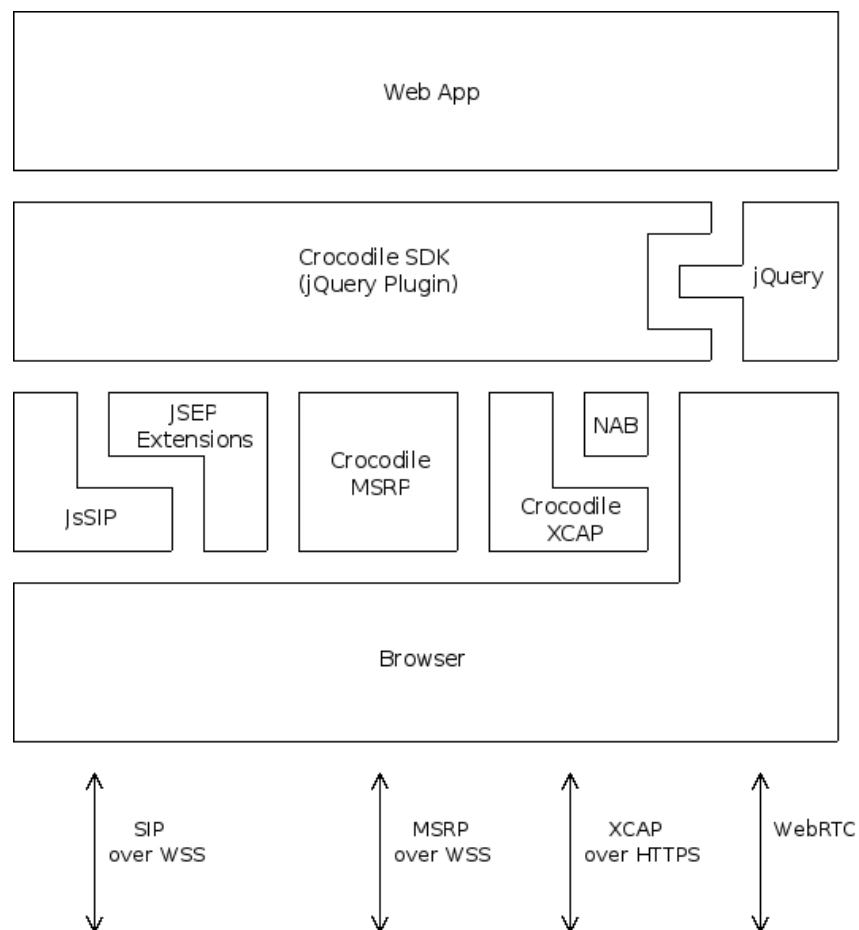
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Crocodile SDK Components

- JsSIP (Javascript stack)

  - Best-of-breed

  - Easily extendable (good object model)

- Crocodile JsSIP extensions

  - Overridden JsSIP.Session

  - JSEP ICE Trickling

  - JSEP Session Rehydration

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Crocodile SDK Components

- Crocodile MSRP Client (Javascript stack)
  - Similar object model to JsSIP
  - Known to work with JsSIP (with JsSIP.Session overridden)
- Crocodile XCAP Client (Javascript stack)
- Crocodile NAB Helper (Javascript stack)
  - Manages pres-rules and resource-list documents stored in XCAP
  - Uses Crocodile XCAP Client

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Crocodile SDK

Crocodile Network

- 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
  - Media gateway and server
  - XCAP server

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Thank You

- Any questions?

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