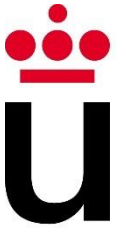
Kurento: The WebRTC Modular Media Server

Boni García

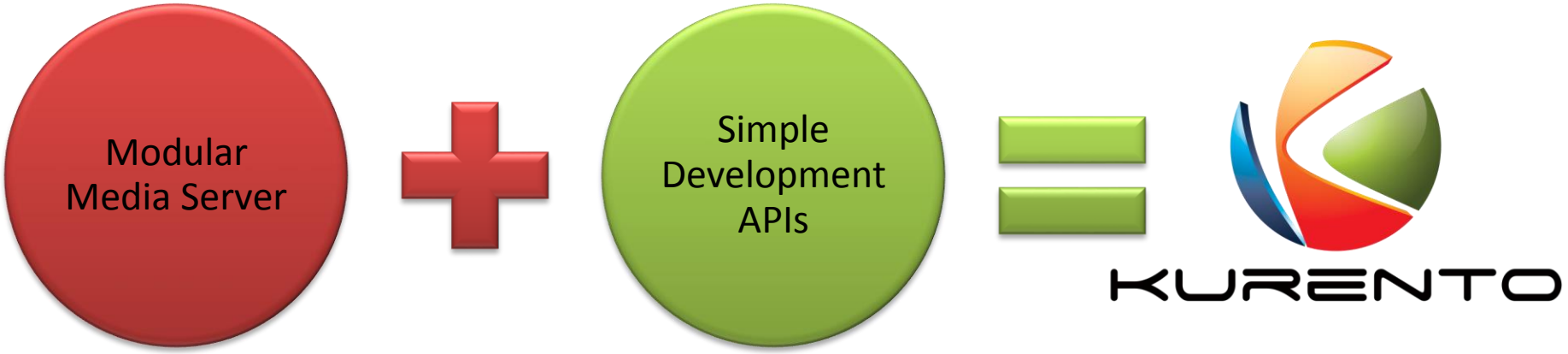
boni.garcia@urjc.es



Universidad
Rey Juan Carlos

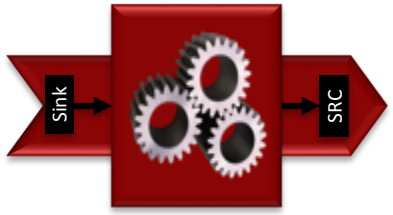
Multimedia development implies **complexity**

The Kurento formula



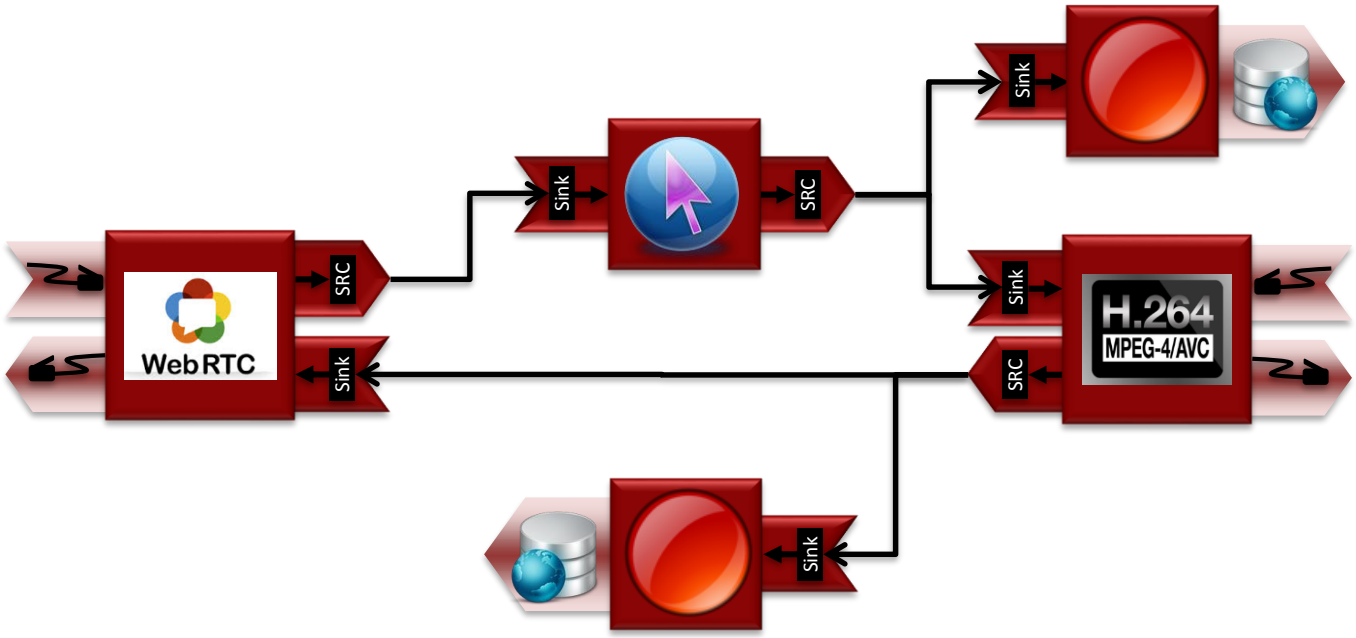
Key concepts: Media elements and Pipelines

- Media Element
  - Provides a specific media functionality
    - Send/receive media. These are the **Endpoints**
    - Process media
    - Transform media
  - Ready to be used
  - New media elements can be added



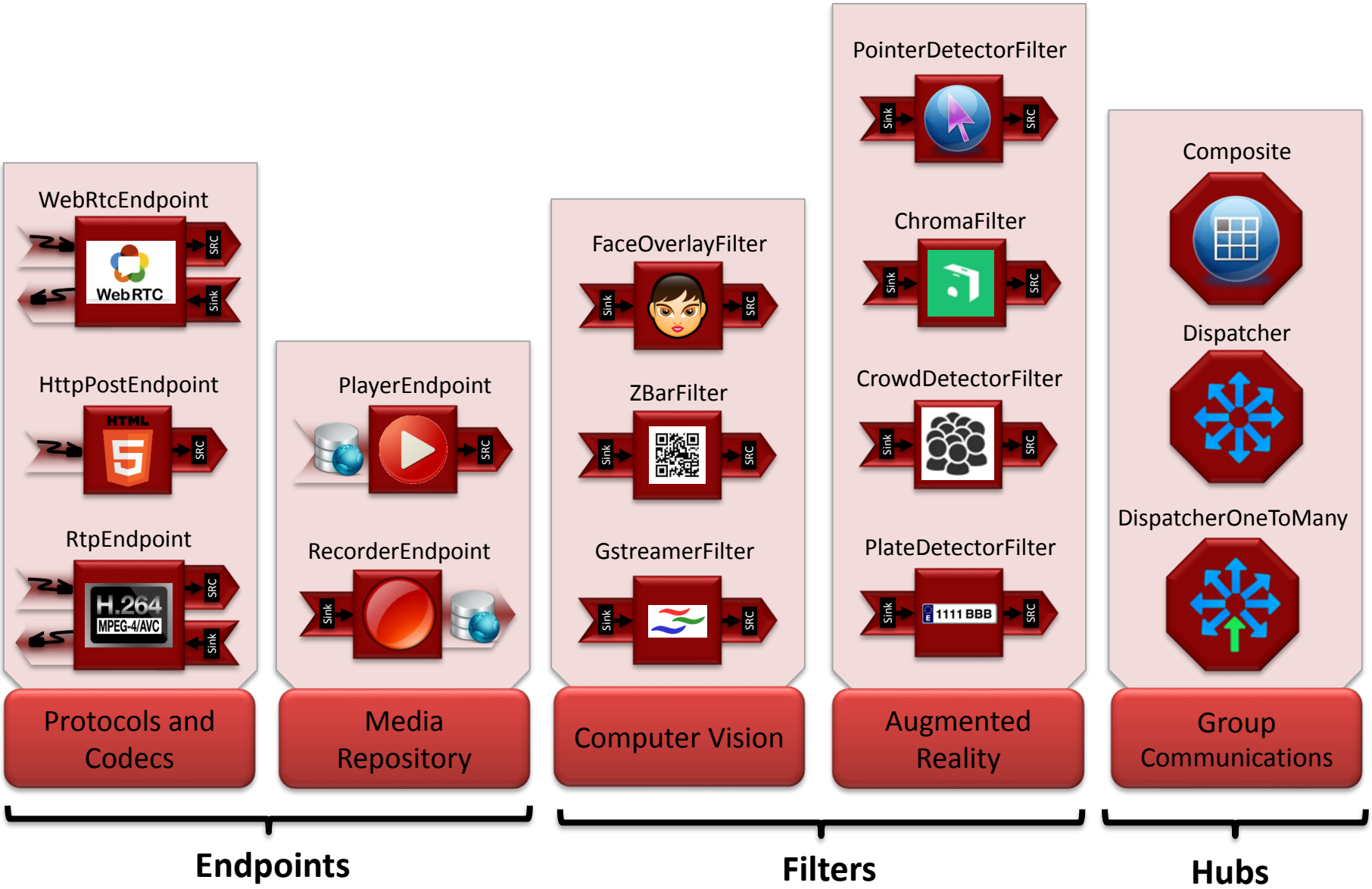
Key concepts: Media elements and Pipelines

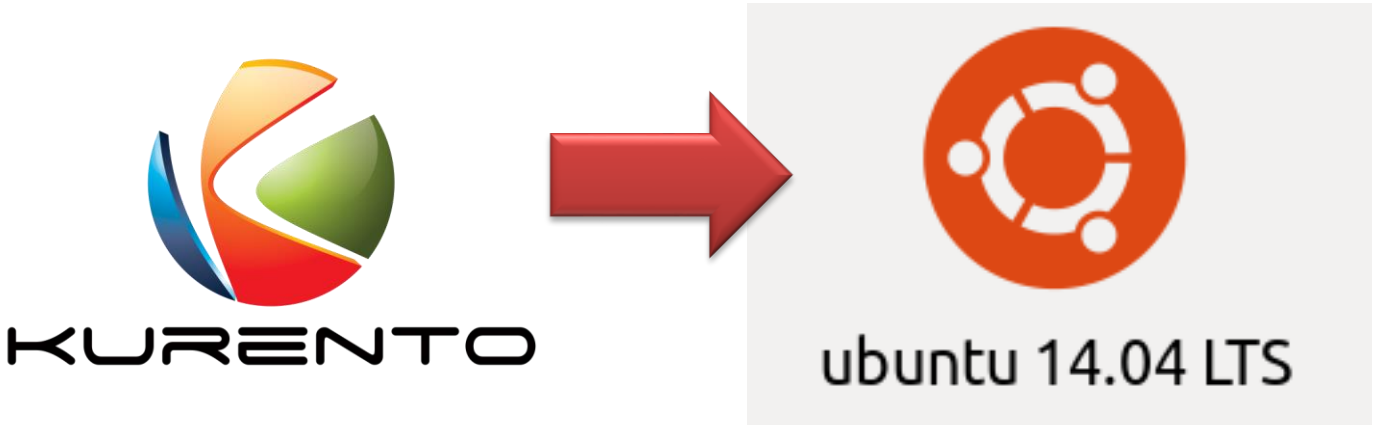
- Media Pipeline
  - Chain of media elements implementing the desired media logic
  - The Media Server provides the capability of creating media pipelines by joining media elements of the toolbox




WebRTC
SRC
Sink
Sink
SRC

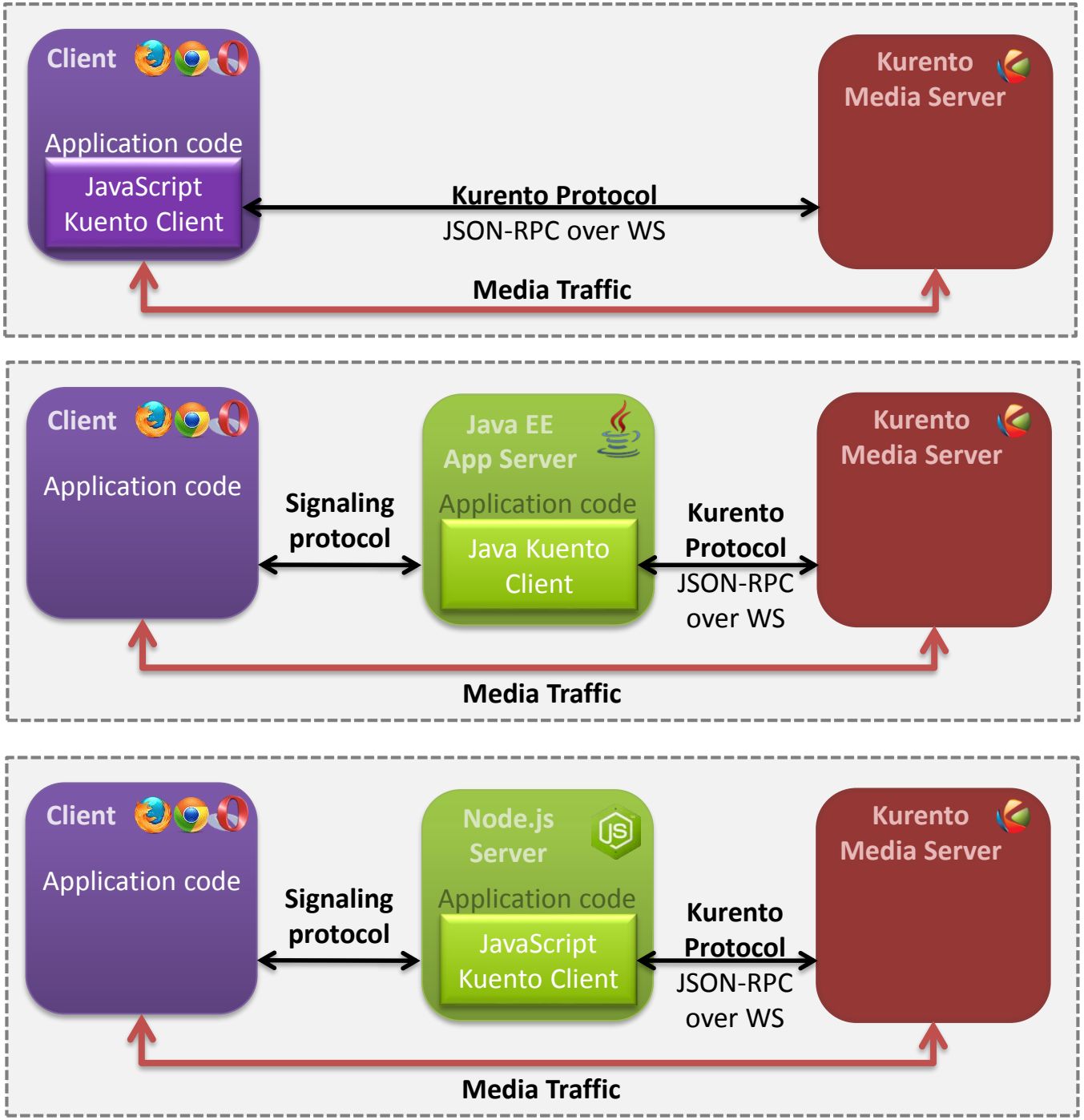
Kurento Toolbox





boni@demo: ~

```
$ echo "deb http://ubuntu.kurento.org trusty kms6" | sudo tee /etc/apt/sources.list.d/kurento.list
$ wget -O - http://ubuntu.kurento.org/kurento.gpg.key | sudo apt-key add -
$ sudo apt-get update
$ sudo apt-get install kurento-media-server-6.0
```


Client
Application code
JavaScript
Kuento Client
Kurento Protocol
JSON-RPC over WS
Kurento
Media Server
Media Traffic
Client
Application code
Signaling
protocol
Java EE
App Server
Application code
Java Kuento
Client
Kurento
Protocol
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Kurento
Media Server
Media Traffic
Client
Application code
Signaling
protocol
Node.js
Server
Application code
JavaScript
Kuento Client
Kurento
Protocol
JSON-RPC
over WS
Kurento
Media Server
Media Traffic

Kurento Development with Java

Java

```java
@Autowired
private KurentoClient kurentoClient;

MediaPipeline pipeline = kurentoClient.createMediaPipeline();
WebRtcEndpoint webRtcEndpoint = new WebRtcEndpoint.Builder(pipeline)
.build();
FaceOverlayFilter faceOverlayFilter = new FaceOverlayFilter.Builder(
pipeline).build();
webRtcEndpoint.connect(faceOverlayFilter);
faceOverlayFilter.connect(webRtcEndpoint);
```

pom.xml

```xml
<dependencies>
   <dependency>
      <groupId>org.kurento</groupId>
      <artifactId>kurento-client</artifactId>
      <version>6.6.0</version>
   </dependency>
   <dependency>
      <groupId>org.kurento</groupId>
      <artifactId>kurento-utils-js</artifactId>
      <version>6.6.0</version>
   </dependency>
</dependencies>
```

Kurento Development with JavaScript for browser

JavaScript

```
kurentoClient.create("MediaPipeline", function(error, pipeline) {
   pipeline.create('WebRtcEndpoint', function(error, webRtc) {
      if (error) return onError(error);
         pipeline.create('FaceOverlayFilter', function(error, filter) {
            if (error) return onError(error);
            webRtc.connect(filter, function(error) {
            if (error) return onError(error);
               filter.connect(webRtc, function(error) {
               if (error) return onError(error);
            });
         });
      });
   });
});
```

bower.json

```
"dependencies": {
   "kurento-client": "6.6.0",
   "kurento-utils": "6.6.0"
}
```

Kurento Development with JavaScript for Node.js

JavaScript

```
kurentoClient.create("MediaPipeline", function(error, pipeline) {
   pipeline.create('WebRtcEndpoint', function(error, webRtc) {
      if (error) return onError(error);
         pipeline.create('FaceOverlayFilter', function(error, filter) {
            if (error) return onError(error);
            webRtc.connect(filter, function(error) {
            if (error) return onError(error);
               filter.connect(webRtc, function(error) {
               if (error) return onError(error);
            });
         });
      });
   });
});
```

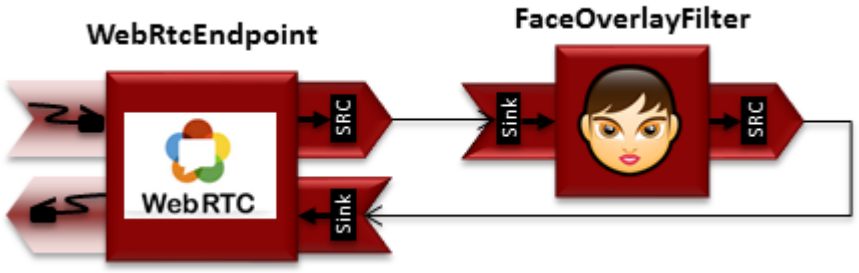
bower.json

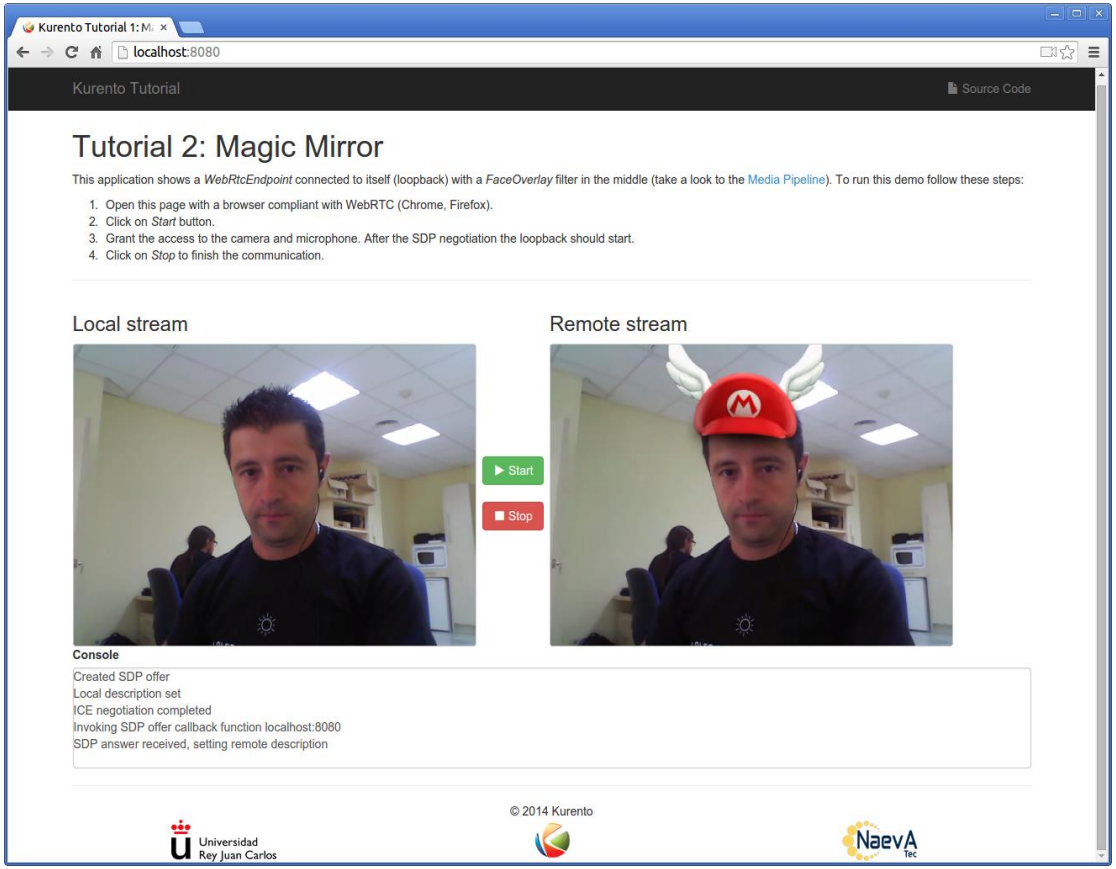
```
"dependencies": {
   "kurento-utils": "6.6.0"
}
```

package.json

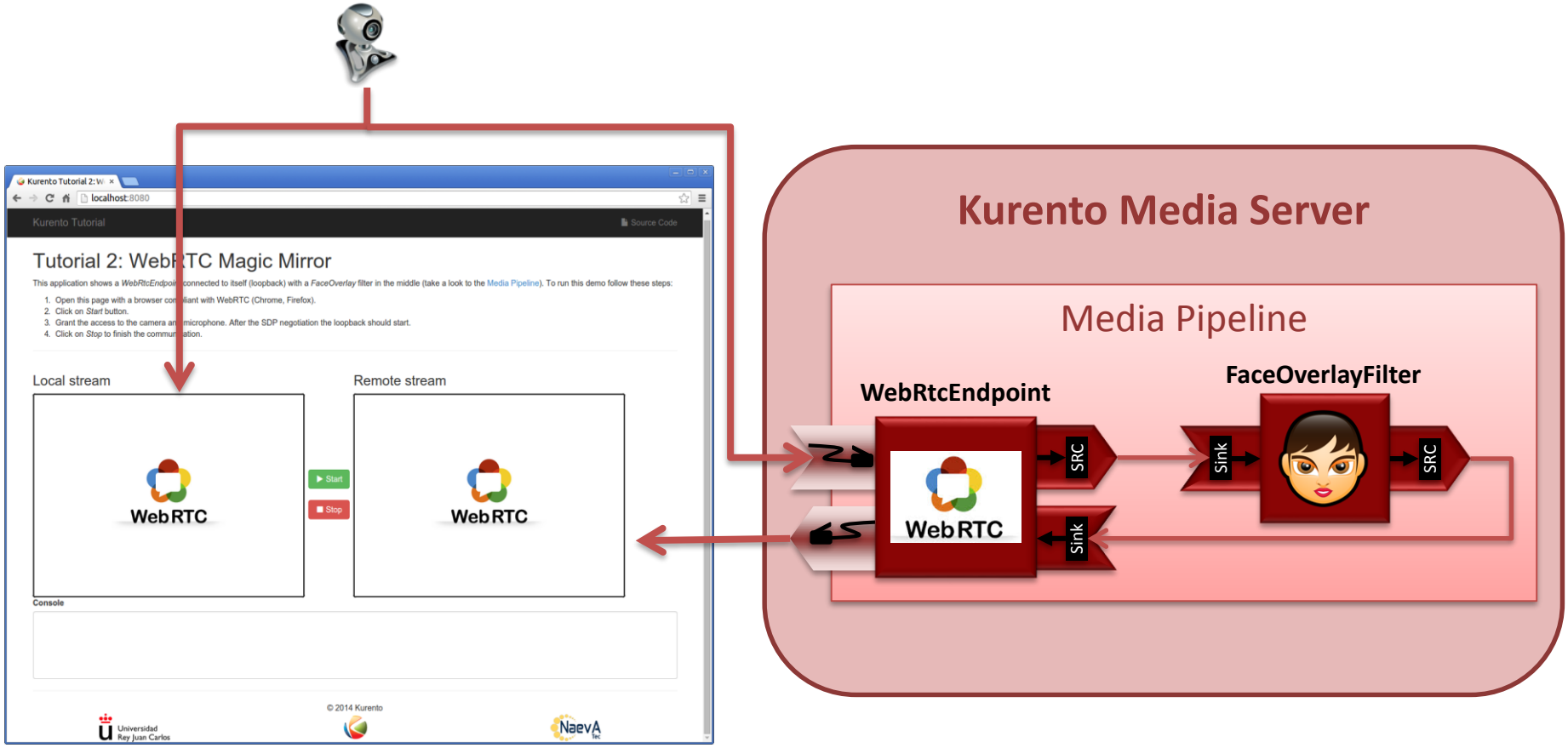
```
"dependencies": {
   "kurento-client": "6.6.0"
}
```

“Magic Mirror” Example

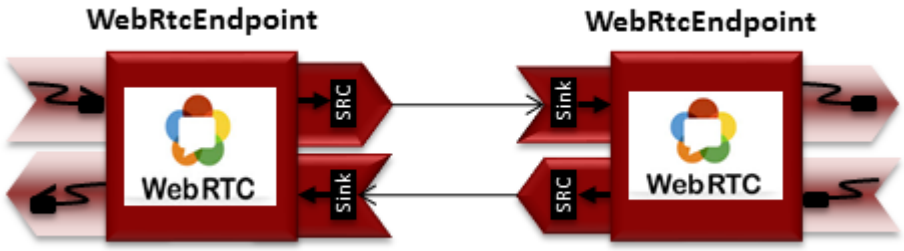


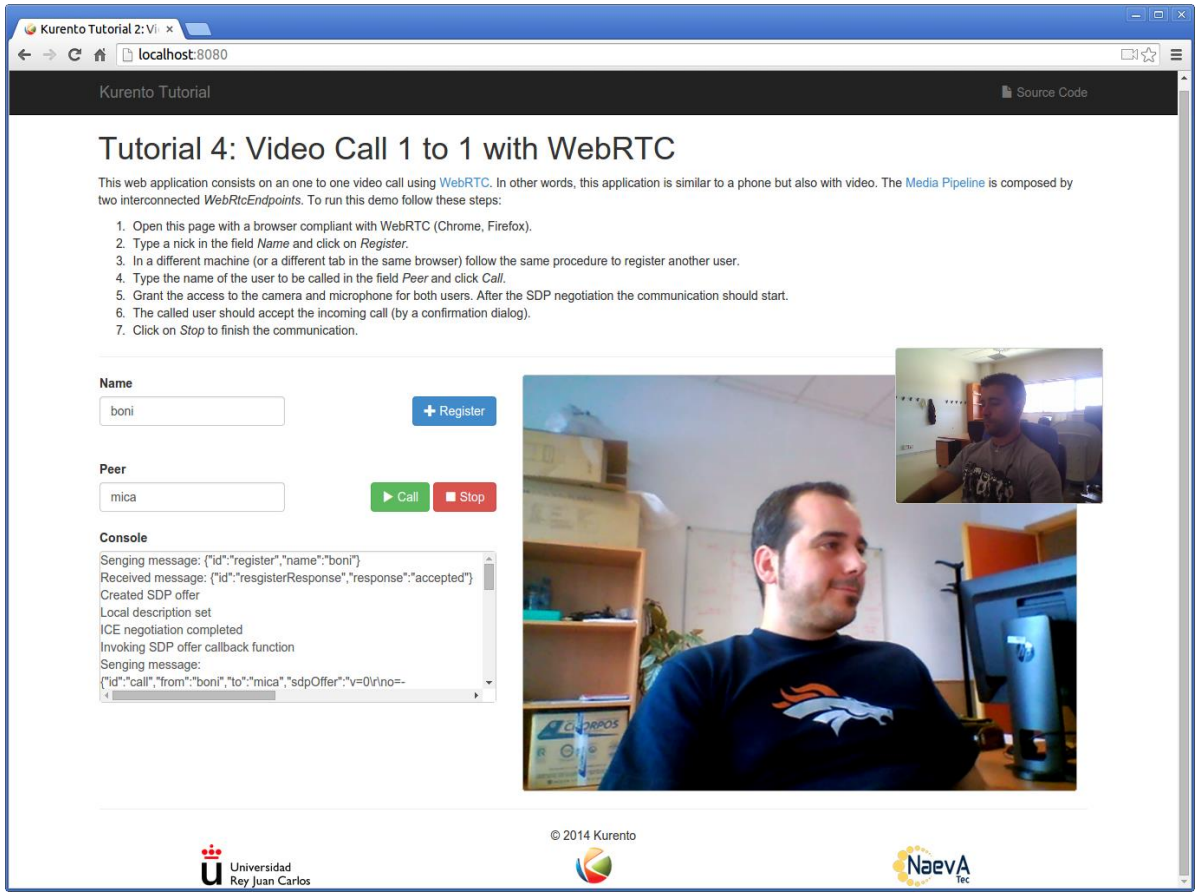


Magic Mirror Media Pipeline

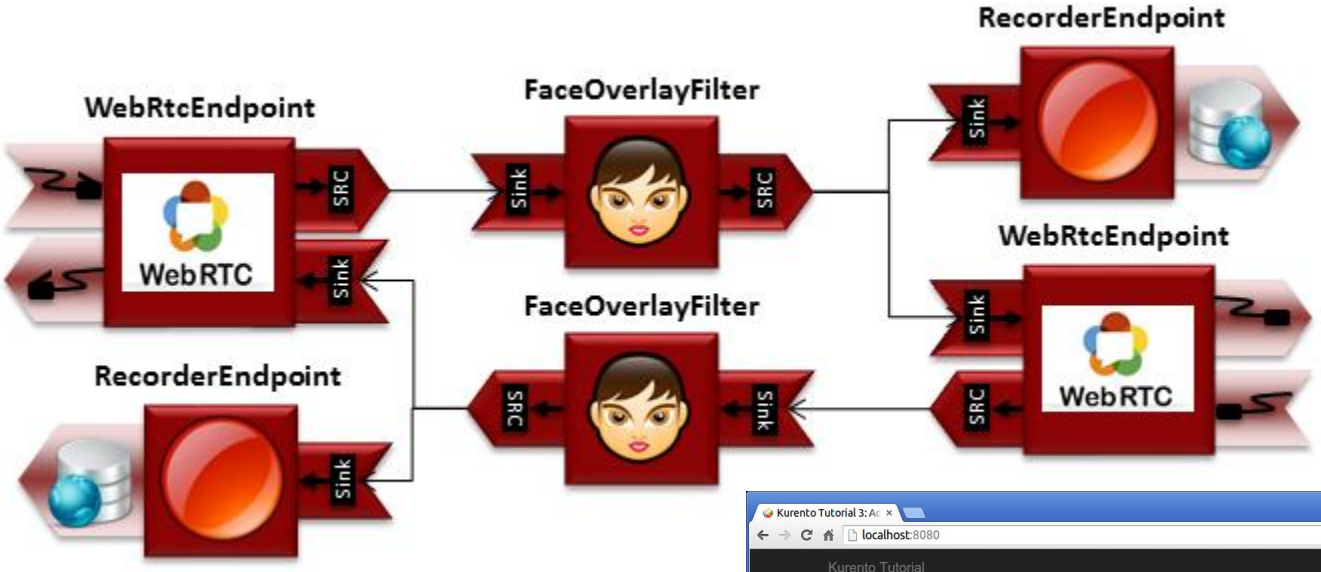


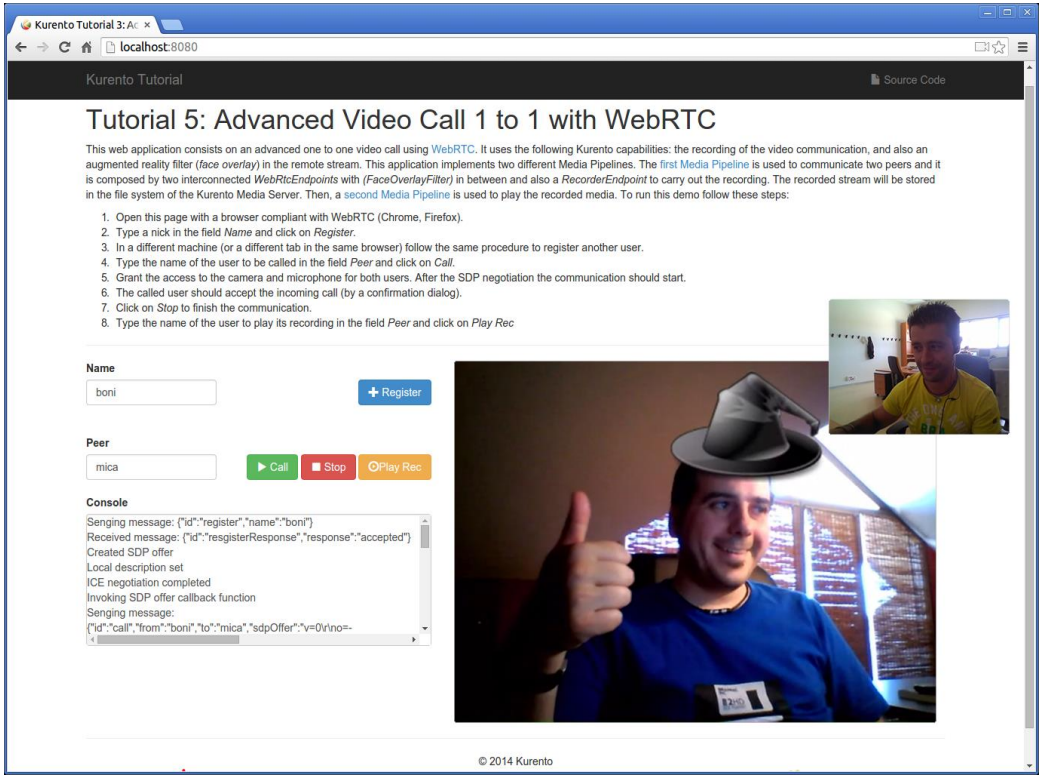
Video call one to one



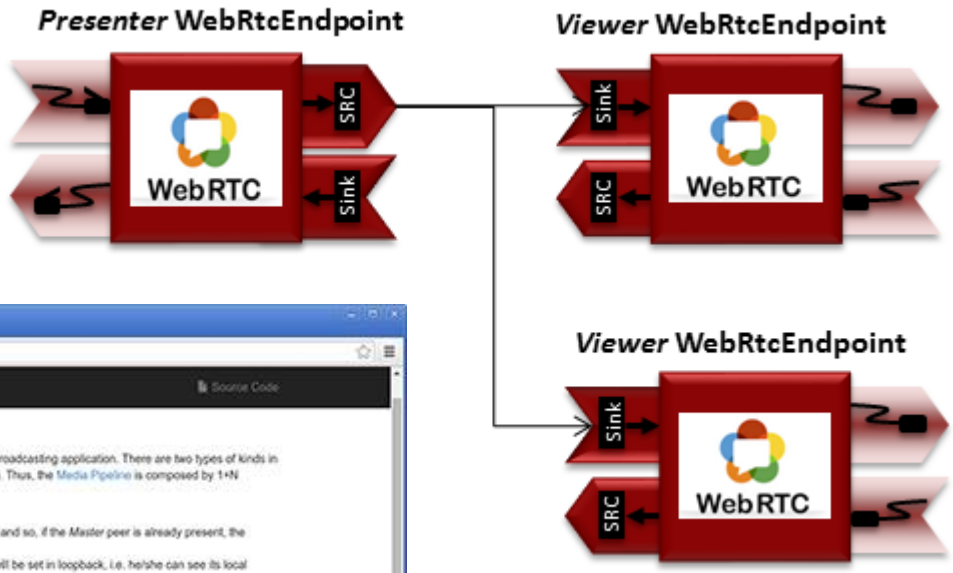


Advanced video call one to one





Video call one to many



Further information

- Home page
  http://www.kurento.org/
- Source code
  https://github.com/kurento
- Developers guide
  http://doc-kurento.readthedocs.io/
- Support
  https://groups.google.com/forum/#!forum/kurento
- Twitter
  https://twitter.com/kurentoms