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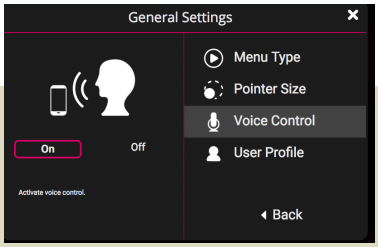
Voice Control

by University of Salford MANCHESTER

Apart from graphical menus and controls, voice control has been identified as a desirable interaction modality for the ImAc player, especially with the availability of home 'smart speakers'.



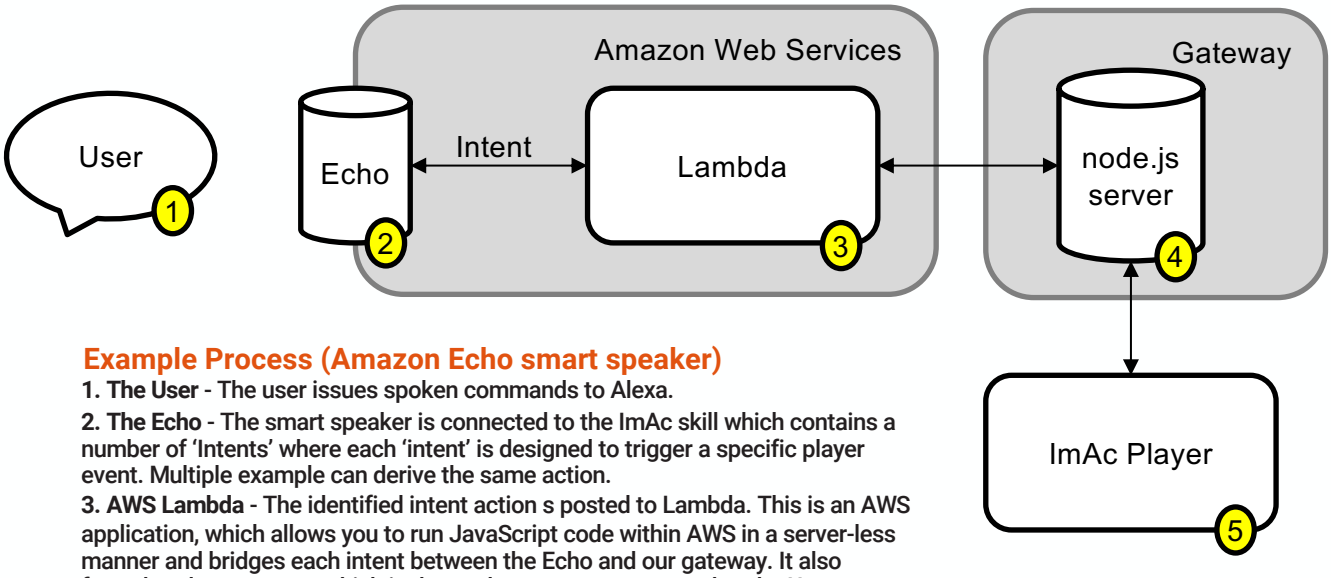
Features

Advantages

- The user can control the player without opening the menu, or removing a head mounted display to find a physical button.
- It is easy to use and learn and allows the user to talk to the player with natural language.
- Provides responses through the smart speaker, not through the player, separating the control from the media.
- Many users are already using and familiar with smart speakers for control.
- The ImAc remote gateway can be easily extended to support new devices as they become available.

How it is works

- A unique identifier is used to specify each each smart speaker or remote controller, usually its serial number.
- When voice control is enabled in the player, the device identifier is specified and the player opens a WebSocket to the gateway with this identifier.
- The gateway listens for requests from any smart speakers and controllers, and forwards the requests to any connected players registered with the same identifier.



Example Process (Amazon Echo smart speaker)

1. **The User** - The user issues spoken commands to Alexa.
2. **The Echo** - The smart speaker is connected to the ImAc skill which contains a number of 'Intents' where each 'intent' is designed to trigger a specific player event. Multiple example can derive the same action.
3. **AWS Lambda** - The identified intent action s posted to Lambda. This is an AWS application, which allows you to run JavaScript code within AWS in a server-less manner and bridges each intent between the Echo and our gateway. It also formulated a response, which is the spoken response returned to the User.
4. **Gateway** - The gateway receives the request and the device identifier that sent it. Any connected players that are registered with the identifier are forwarded the command.
5. **ImAc Player** – The player responds to the command.

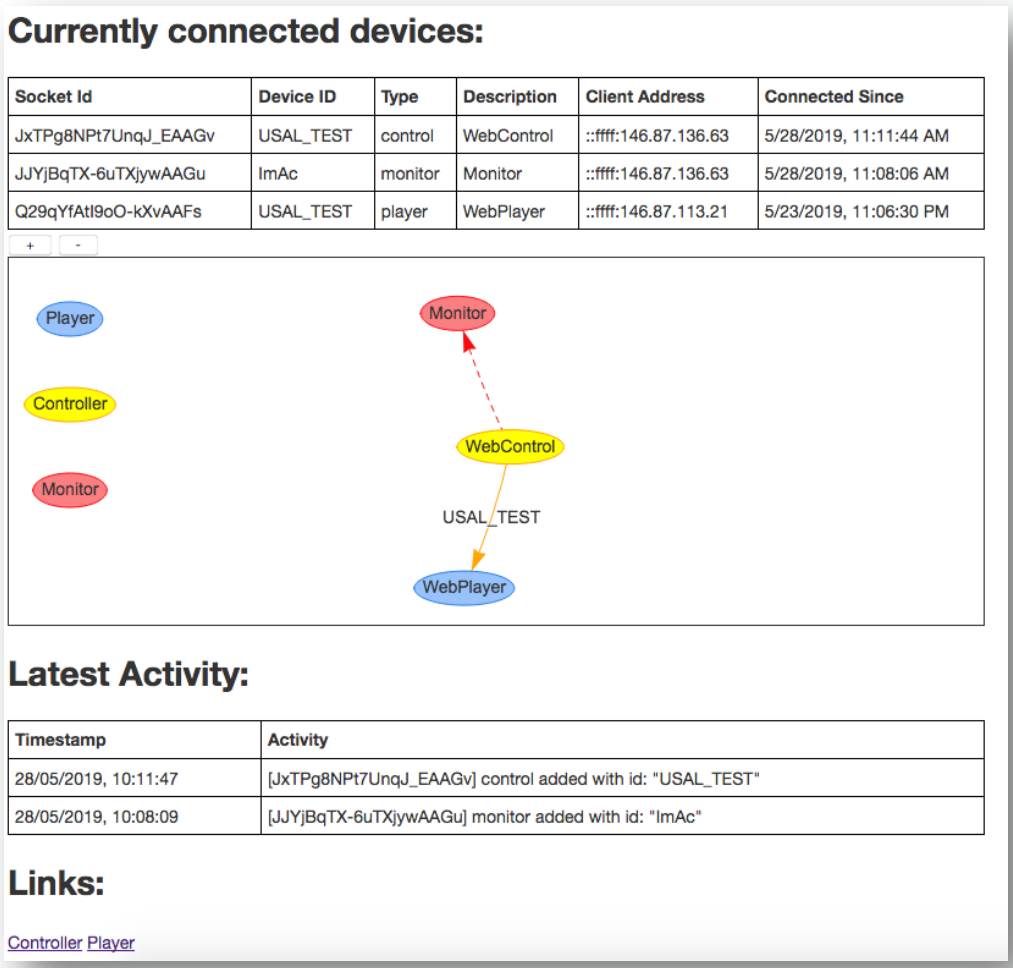
ImAc Gateway

The Gateway Server

- The gateway is a Node.js server which manages all of the communication between voice control devices and the player.
- There are three types of 'device', which can connect to the gateway:
  1. Controllers – Any device which issues commands
  2. Players – Any device which consumes commands
  3. Monitors – Any device which consumes all communications for testing and monitoring
- For example: If you have a player with the ID 'USAL' it will receive commands from a controller with the ID 'USAL' but not from a controller with the ID 'I2CAT'.

The Gateway Monitor:

- The gateway-monitor page contains three sections as below:
- 'Currently connected devices', shows all of the connections to the gateway. The gateway-gateway-monitor page will appear in the list of devices as a monitor, and you can then see each of the connected players, controllers and other monitor pages that are currently open.
- 'Latest Activity' shows the every activity that the server has performed since you opened the page. This includes devices connecting and disconnecting as well as commands being sent.
- 'Links' gives two html links to other pages on the server, which replicates a controller and a player. Opening either of these will ask for the user to type in a device ID, and then replicate either a controller or a player.



Currently connected devices:

Socket Id	Device ID	Type	Description	Client Address	Connected Since
JxTPg8NPt7UnqJ_EAAGv	USAL_TEST	control	WebControl	::ffff:146.87.136.63	5/28/2019, 11:11:44 AM
JJYjBqTX-6uTXjywAAGu	ImAc	monitor	Monitor	::ffff:146.87.136.63	5/28/2019, 11:08:06 AM
Q29qYfAtl9oO-kXvAAFs	USAL_TEST	player	WebPlayer	::ffff:146.87.113.21	5/23/2019, 11:06:30 PM

+ -

Latest Activity:

Timestamp	Activity
28/05/2019, 10:11:47	[JxTPg8NPt7UnqJ_EAAGv] control added with id: "USAL_TEST"
28/05/2019, 10:08:09	[JJYjBqTX-6uTXjywAAGu] monitor added with id: "ImAc"

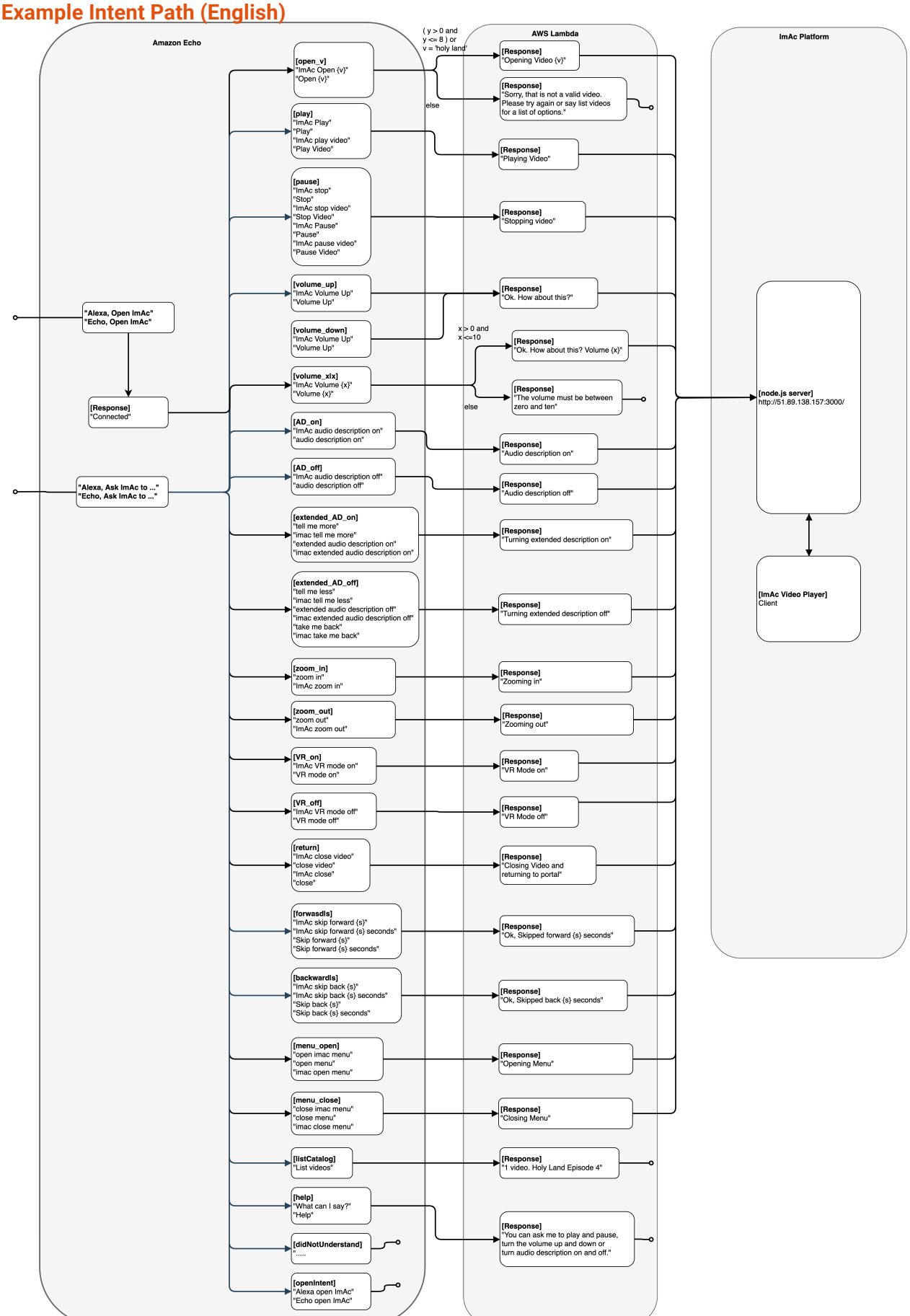
Links:

Controller Player

Further Details

Contact: c.j.hughes@salford.ac.uk

Example Intent Path (English)



Example Intent Path (Spanish)