



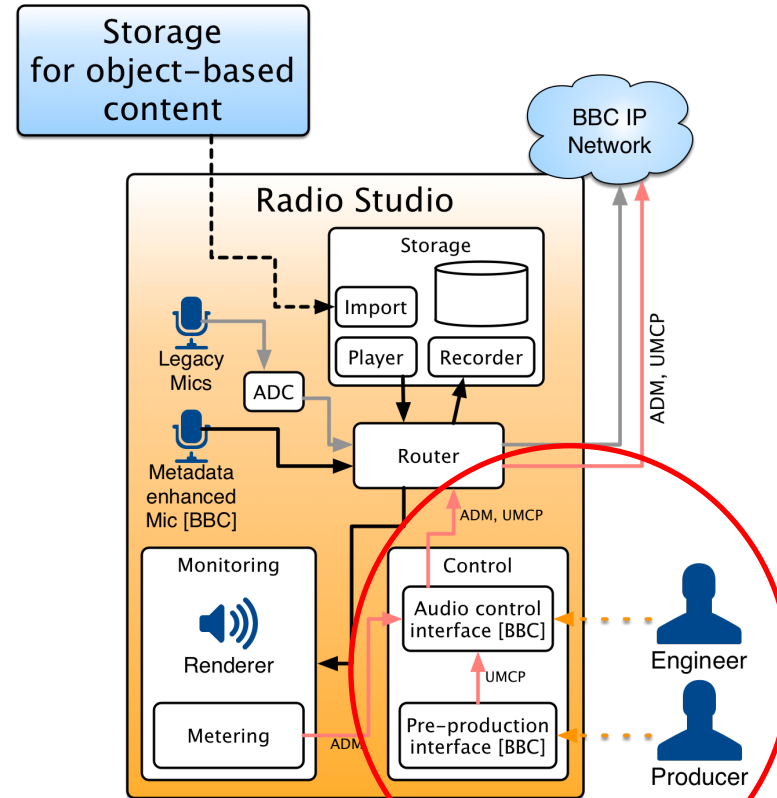
# IP Studio and Radio Production

Chris Baume  
BBC Research and Development

EBU Object-based Audio Seminar, Geneva, 18<sup>th</sup> May 2017



# Architecture

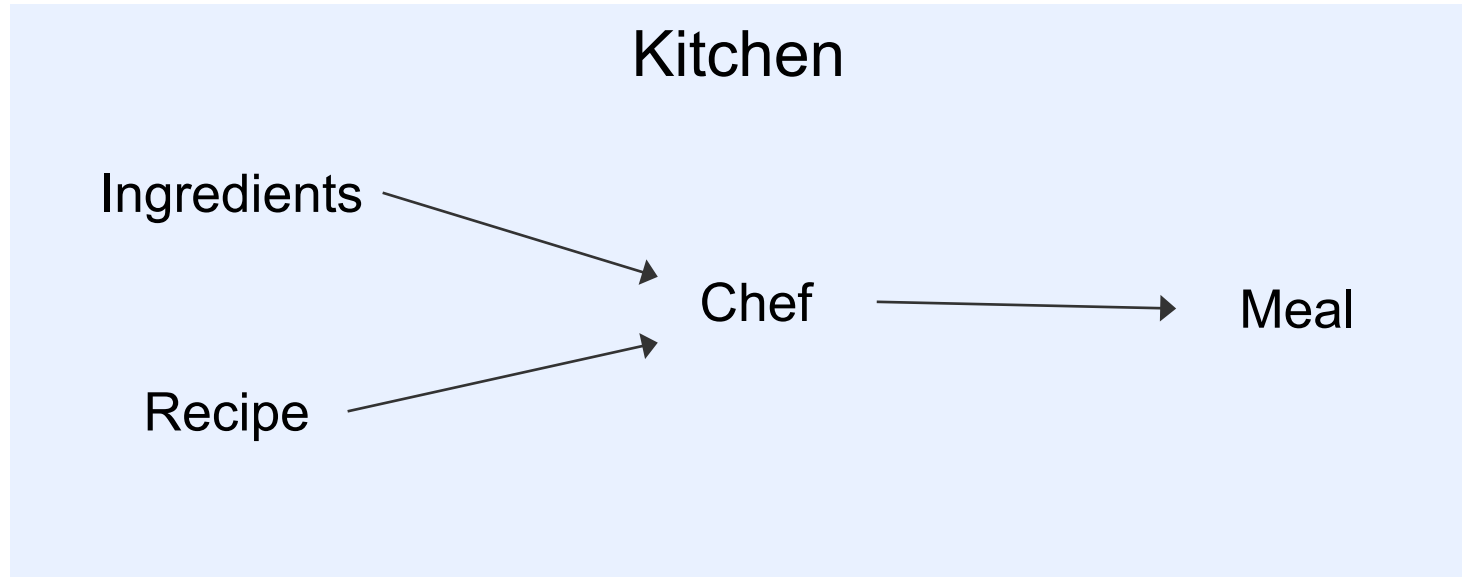




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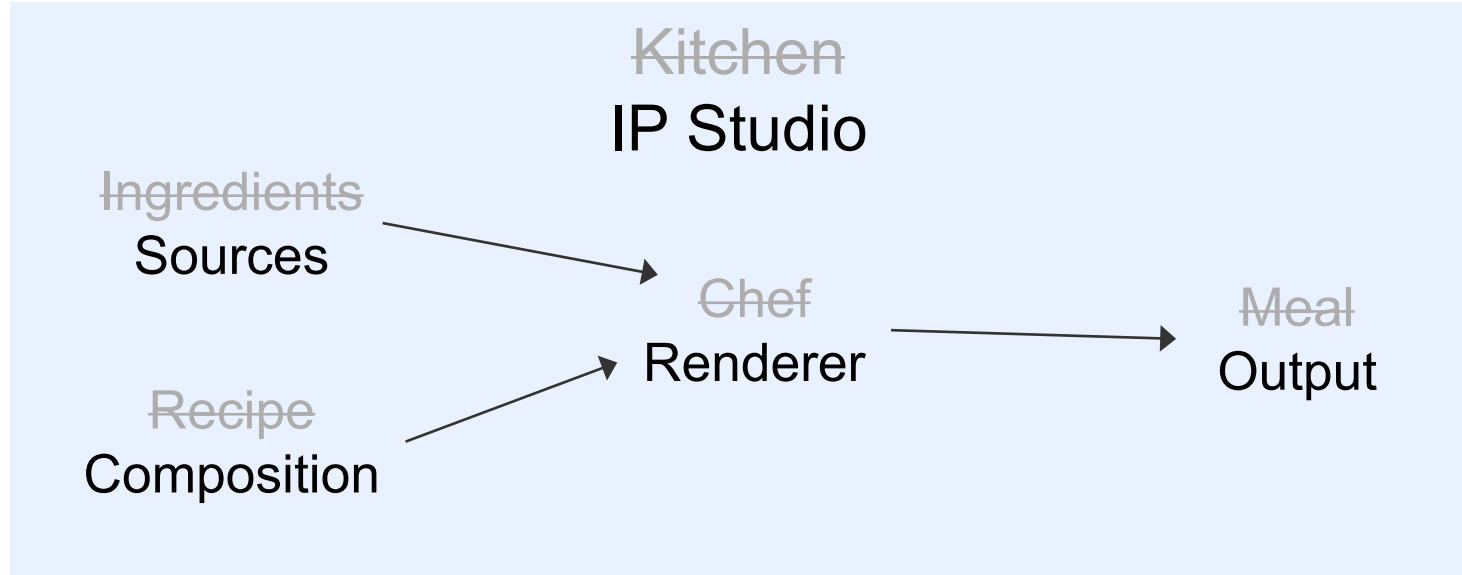


# Cooking analogy





# Cooking analogy





## IP Studio – ‘the kitchen’

- Experimental production platform for developing and testing a new broadcast system
- Entirely IP-based, uses RTP and multicast
- Uses NMOS specification for identification, discovery and timing
- AES67 compatible

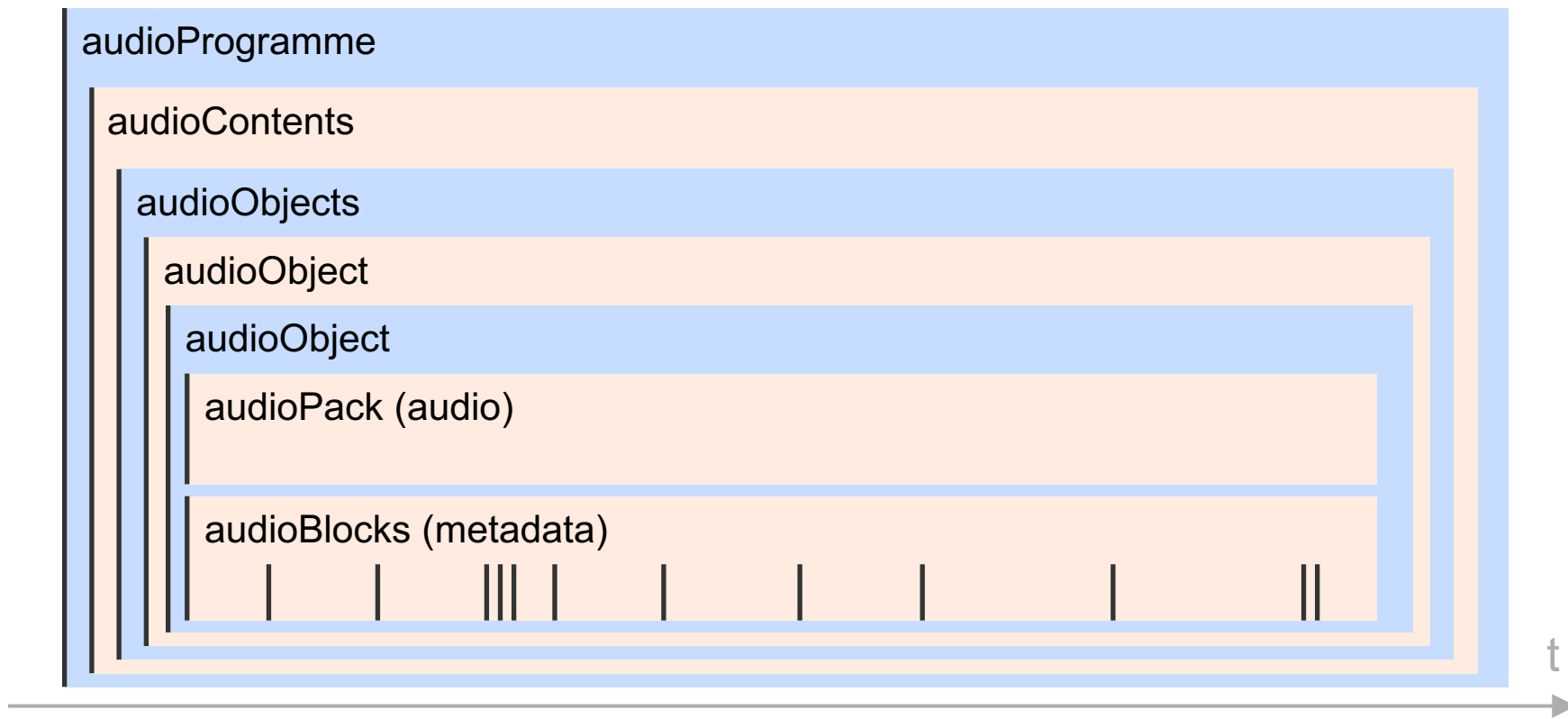


# Universal Media Composition Protocol – ‘the recipe’

- Describes assembly of media sources
- Planned to be a proposal for an open standard
- Media agnostic
- Uses NMOS specification for identity and timing
- Nestable – compositions of compositions
- Co-ordinated using an API using pub/sub
- Event-driven, uses operational transformation
- Can be used with Audio Definition Model



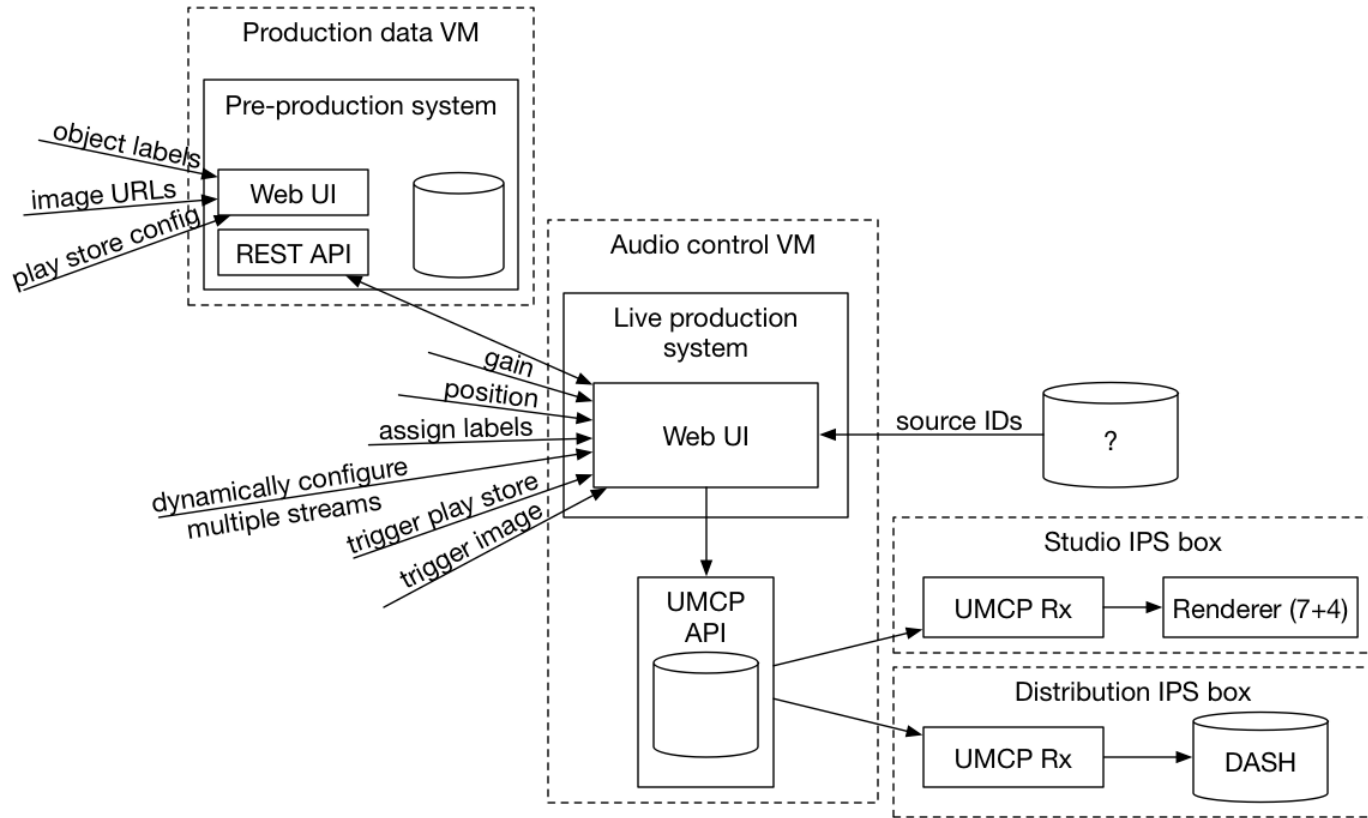
## UMCP mapping to ADM







# Metadata flow





# Pre-production interface

## Captures:

- Programme information (title, description etc.)
- Running order
- Names of contributors
- Music playlist
- Sound clips



# Pre-production interface

**BBC Running Order Tool**

## Woman's Hour

00:00	Shakira Martin
08:20	Embryo 'Adoption' in the US
08:50	<div><div> Script Item </div><div>Shakira Martin is the new President of the National Union of Students. Shakira joins Jane to discuss the challenges and triumphs of her career, and why she's so proud to call herself a "Black single mother from a working-class family."</div><div> Annotation </div></div>
16:04	Music Item
25:04	Coaching Women's Sport – Adapting to Female Sporting Needs

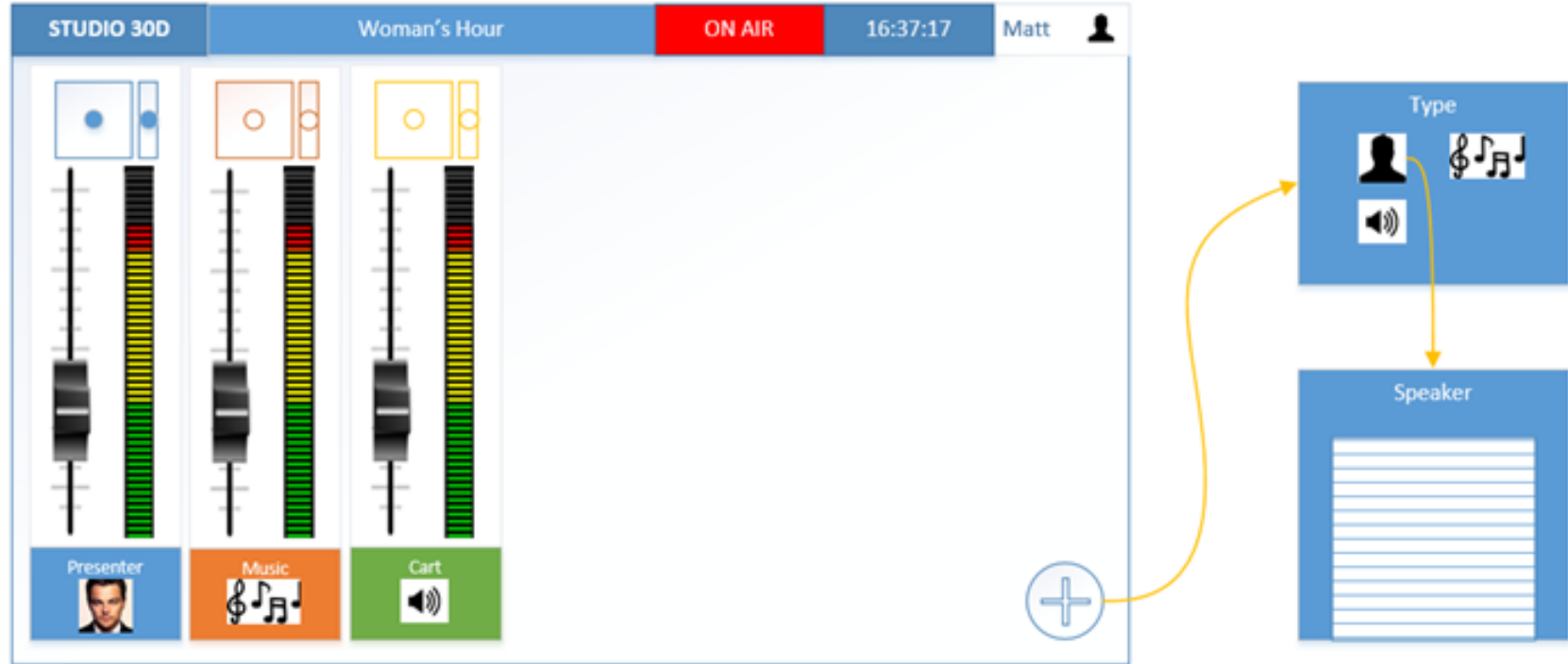


# Audio control interface

- Configures objects
- Assigns identities, labels
- Defines interactivity
- Sets gain and position of objects
- Metering of inputs and rendered output
- Triggers music/sound clip playback

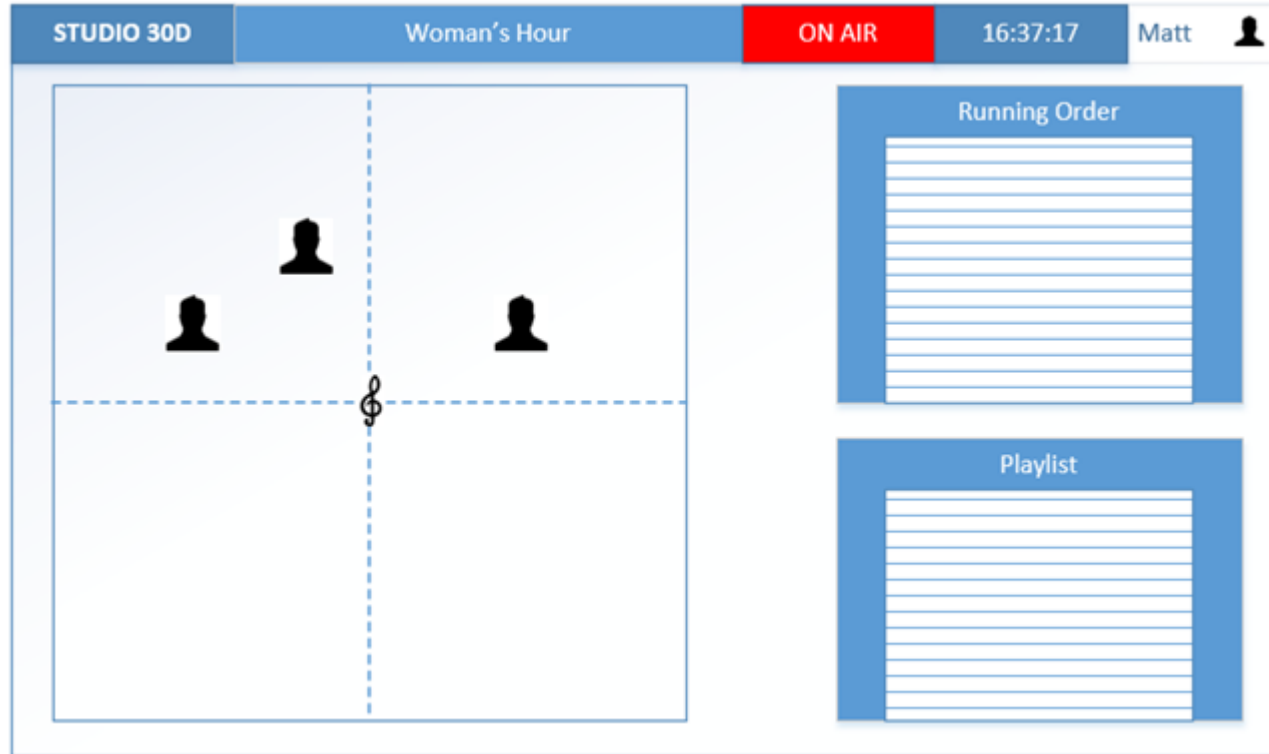


# Audio control interface





# Audio control interface





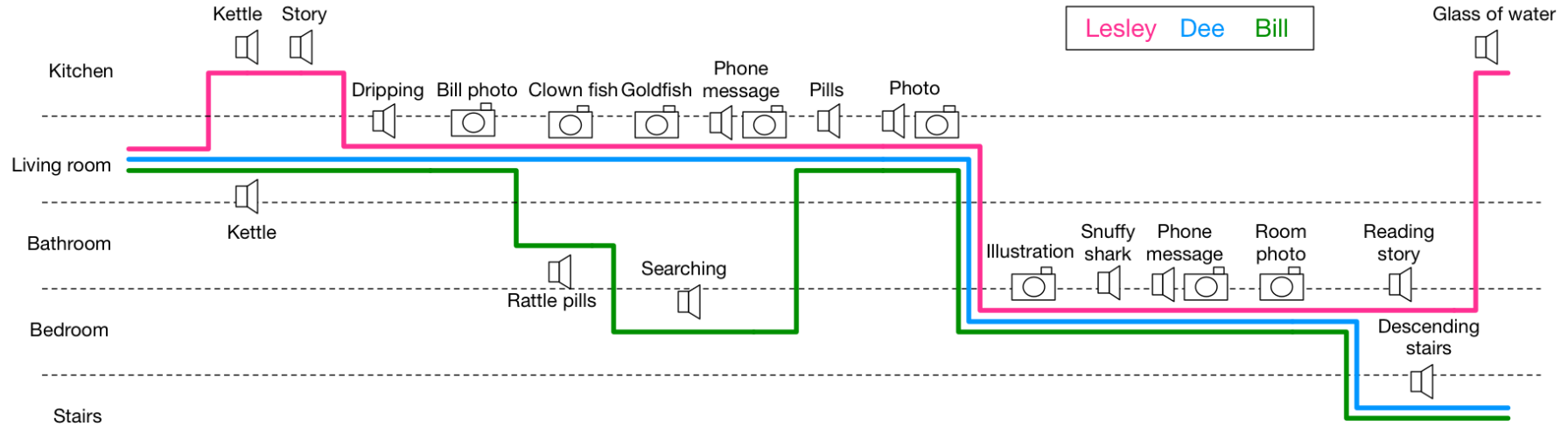
## "The Mermaid's Tears"

- Object-based radio drama
- Commissioned by and written especially for Orpheus
- Accessible through web browser
- Binaural and VBAP playback rendering using Web Audio API
- Multiple storylines - follow one of three characters
- Image triggering
- Available in early July

**LIVE!**



# "The Mermaid's Tears"





Thank you for your attention!



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