

Pretty Good JackTrip Toolkit

Panel Discussion – NowNet Arts Conference
2023

Moderator

Mike O'Connor

Panelists

Ximena Alarcon

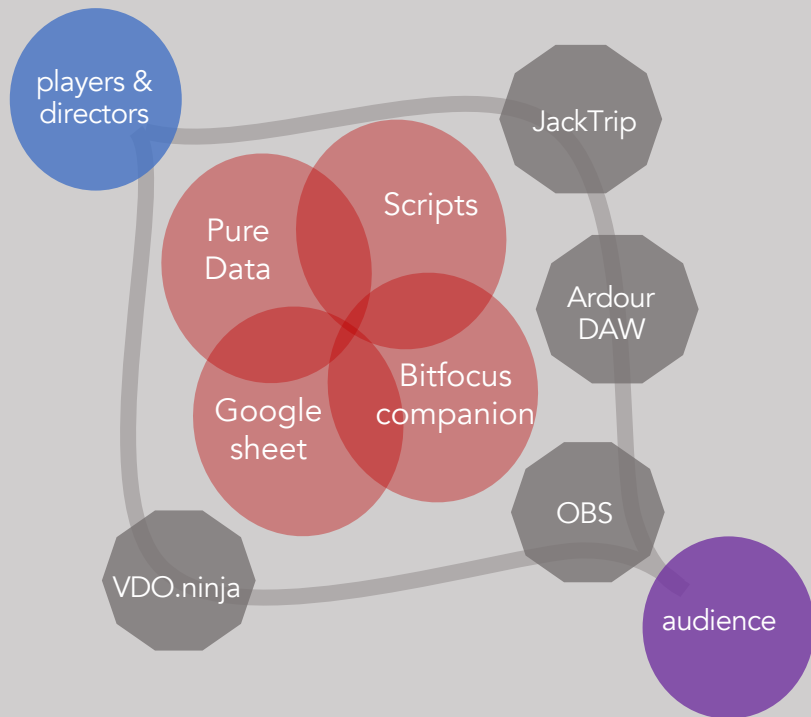
Cássia Carrascoza Bomfim

Gloria Damijan

Colin James Gibson

Jane Wang

Sarah Weaver

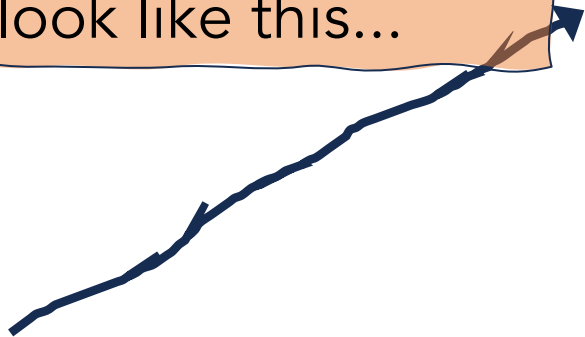


My process was this



The process unfolded as a series of puzzlers presented by Sarah Weaver and members of the NowNet Hub ensemble. The solutions to those puzzlers is the story for today.

Apologies if I make it look like this...



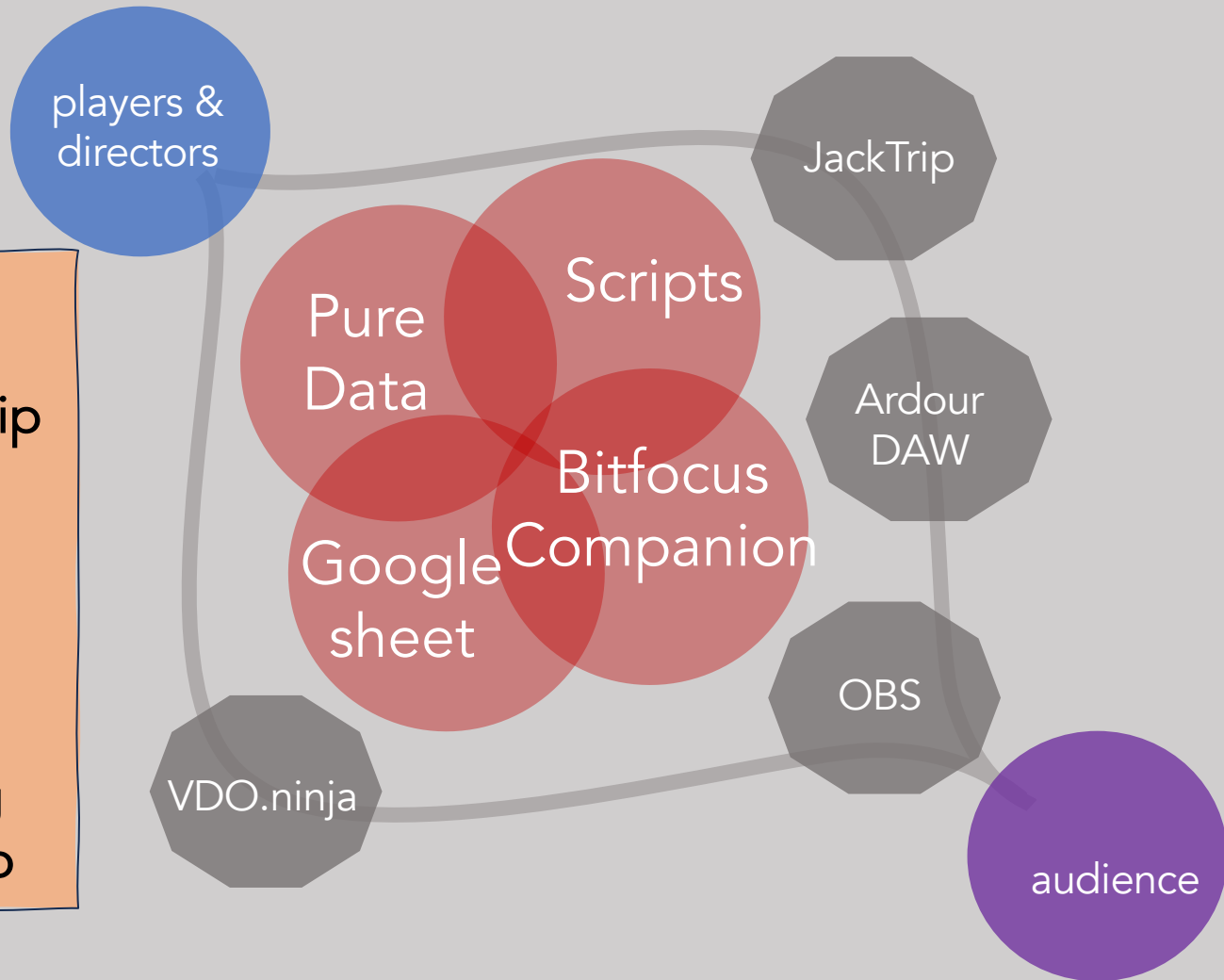
Or this

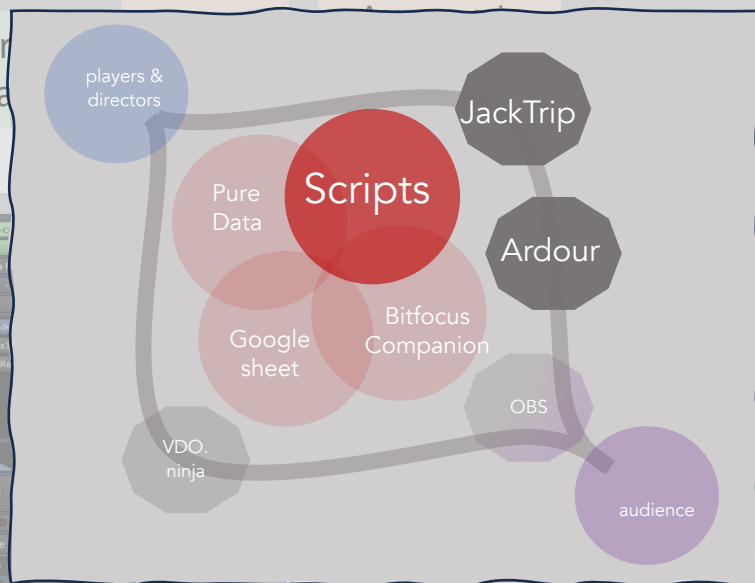
System Integration (from ChatGPT)

- System integration is the process of linking together different computing systems and software applications physically or functionally, to act as a coordinated whole.
- The systems to be integrated may be various software applications, databases, computing systems, or a mix of these. This process is complex and involves various steps, including:
 - determining system requirements,
 - selecting the appropriate systems,
 - designing how the systems will connect,
 - implementing the connections, and
 - testing to ensure everything is functioning correctly.
- The goal of system integration is to create a more efficient system that eliminates redundant processes and automates data flows, ultimately improving operational efficiency and productivity.

Puzzler-solutions

- Pretty Good JackTrip toolkit (PGJTT)
- Connect Players Script
- Gloria's cues
- VDO.ninja
- Custom cue-mixing
- Multi-channel audio





Enable and balance self-mixes

Puzzler : It was hard to set up a JackTrip server that could reliably host and mix a large ensemble

PGJTT (Pretty Good JackTrip Toolkit)

```
#!/bin/bash
# Load a copy of this script into root's home
curl -o ~/PGJTT-Main-Install_v3.1.5.sh https://PGJTT.com/Scripts/PGJTT-Main-Install_v3.1.5.sh

# Install update-logs and status-file script
curl -o /usr/local/bin/PGJTT-update_logs-3.1.4.sh https://PGJTT.com/Scripts/PGJTT-update_logs-3.1.4.sh
chmod +x /usr/local/bin/PGJTT-update_logs-3.1.4.sh
```

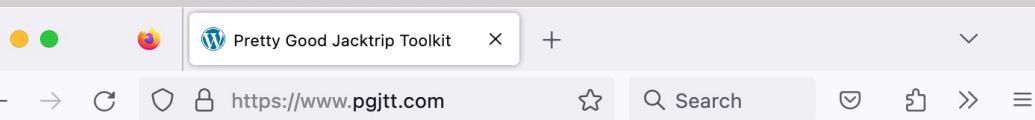
Apply FX & pan

Ride gain

Establish Mix

Connect

To Players



Pretty Good Jacktrip Toolkit



Home

Build your own server — in four steps

Step1: Provision a Linode server with one of these Linode Stackscripts

[Legacy – version 3.1 5](#)

[Current – version 3.2 1](#) (adds multi-channel audio and cue-mixing)

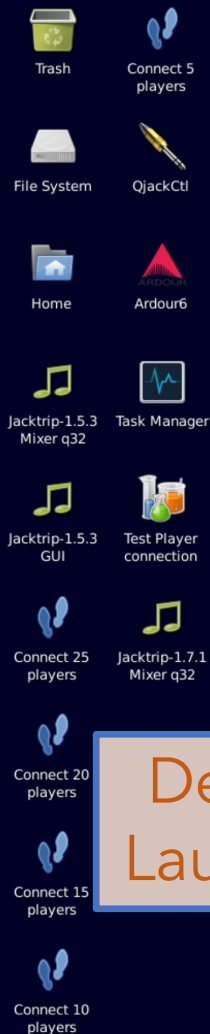
Step2: Wait about 10 minutes and then SSH into the newly-provisioned server

Step3: Answer “yes” to the realtime audio prompt in the script

Step4: Log out and back in again when the script completes

www.PGJTT.com

Debian Linux (with the Xfce desktop, launchers for software & scripts, and utilities for file browsing & editing/system monitoring/etc. – delivered on a VNC remote-desktop (TightVNC)



Desktop
Launchers

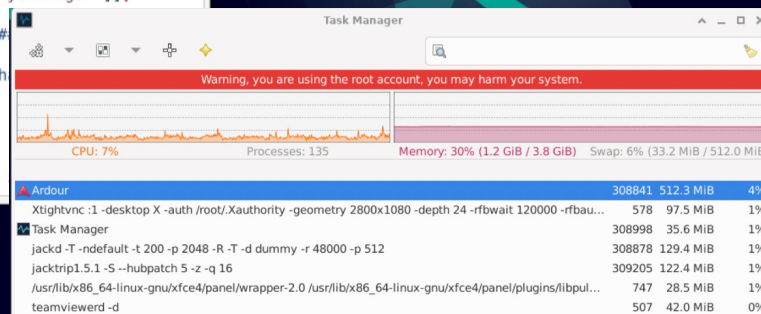
```
#!/usr/local/bin/connect_players.sh - Mousepad
File Edit Search View Document Help
Warning: you are using the root account. You may harm your system.

then
:
#####
# Scenario 2?
# Player:      in Jack?      NOT in Mixer?
#
# - determine how many channels we're receiving
#
#####

else
#####
queryString3='*'Player'$playerName
if [[ $newJackConnections == *$queryString* ]];

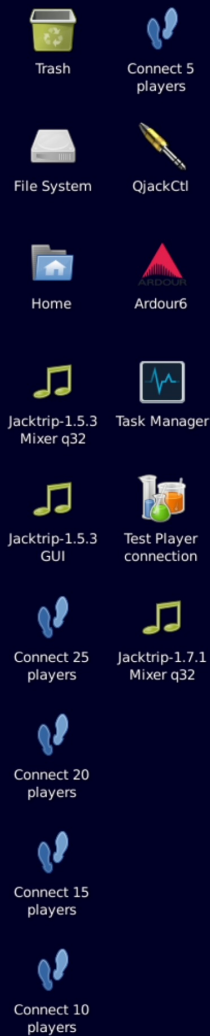
#####
# Scenario 2.a?
# receive_2 connected? - we're receiving stereo: assume th
# sending on 2 channels:
#
# - connect player, wait,
# - add to current_Mixer_connections
# - execute Jmess against a multi XML file for this player
#####
```

Text
editor



Task manager

JackTrip, Jack and Qjackctl

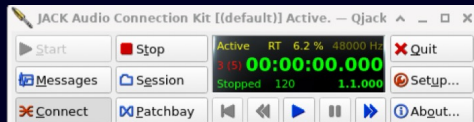


```
Terminal -
File Edit View Terminal Tabs Help

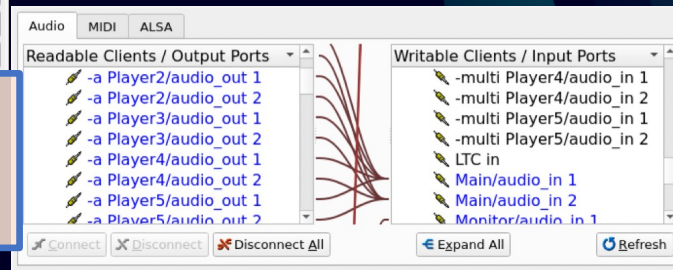
-----
Using JitterBuffer strategy 1
Waiting for Connection From a Client...
UDP Socket Receiving in Port: 61002
-----

Waiting for Peer...
JackTrip HUB SERVER: Total Running Threads: 1
=====
spawning jacktripWorker (auto hub patching disabled)
Received Connection from Peer!
```

JackTrip



Jack and
Qjackctl

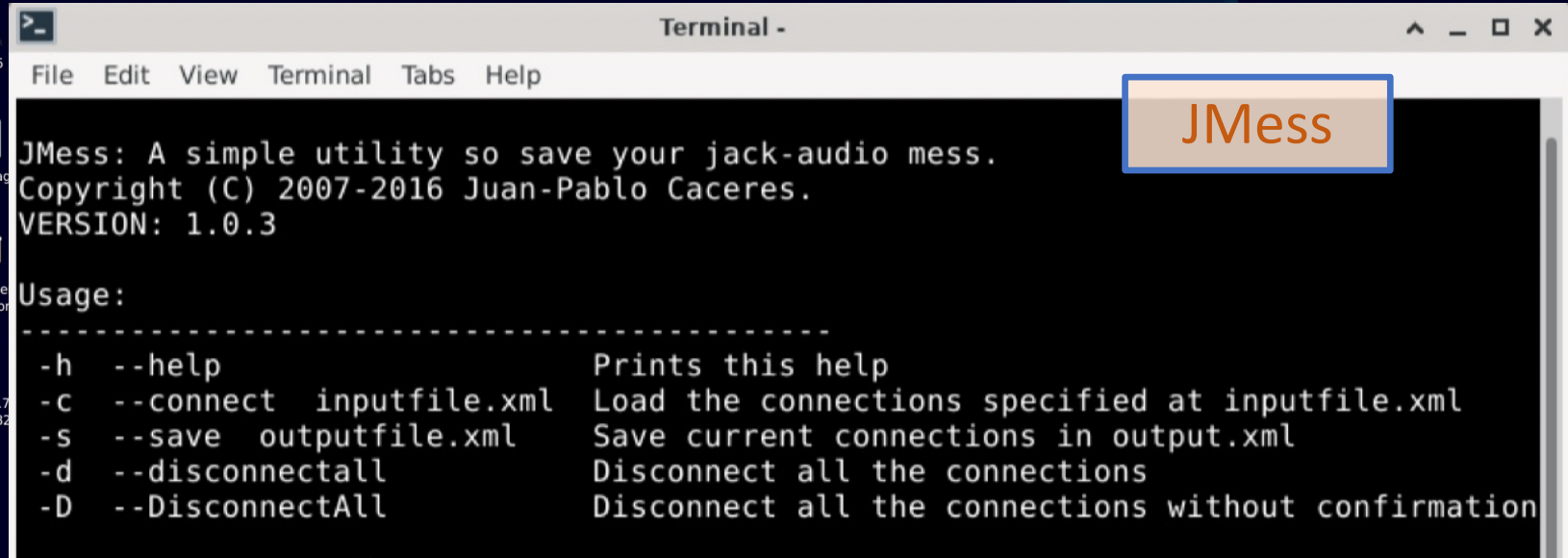


Ardour DAW (with templates to launch 5, 10, 15, 20 and 25-player mixers and provide players with individualized monitor/cue-mixing)



JMess

(for managing audio routing)

A terminal window titled "Terminal -" with a menu bar (File, Edit, View, Terminal, Tabs, Help). The terminal displays the JMess help text. A blue box highlights the word "JMess" in the top right corner of the terminal window. A yellow line points to the terminal window from the bottom left, and a green line points to the "JMess" box from the right.

```
Terminal -
File Edit View Terminal Tabs Help

JMess: A simple utility so save your jack-audio mess.
Copyright (C) 2007-2016 Juan-Pablo Caceres.
VERSION: 1.0.3

Usage:
-----
-h --help                Prints this help
-c --connect inputfile.xml Load the connections specified at inputfile.xml
-s --save outputfile.xml  Save current connections in output.xml
-d --disconnectall        Disconnect all the connections
-D --DisconnectAll        Disconnect all the connections without confirmation
```




Trash



Connect 5
players



File System



QjackCtl



Home



Jacktrip-1.5.3
Mixer q32



Jacktrip-1.5.3
GUI



Connect 25
players



Connect 20
players



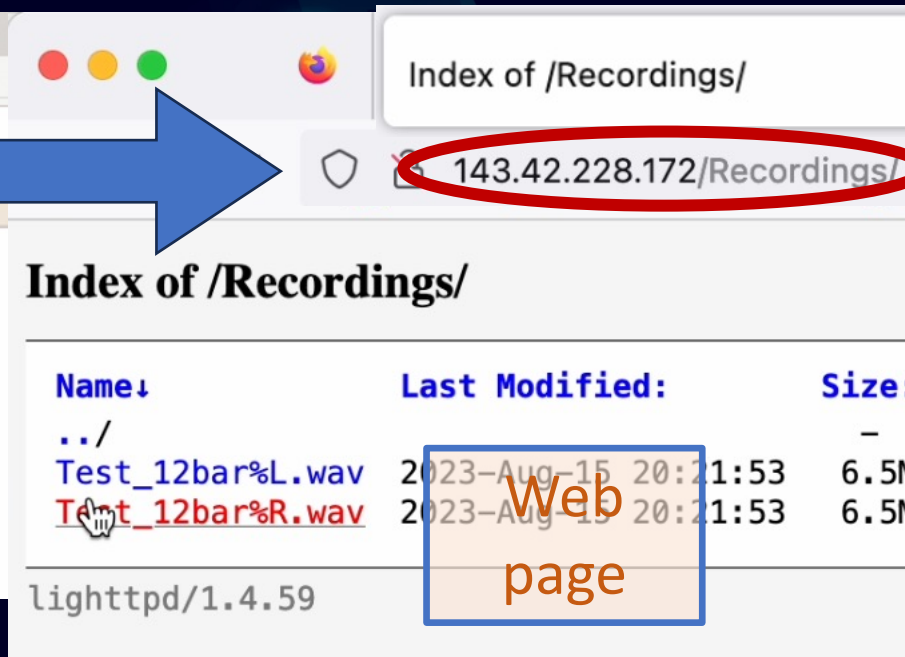
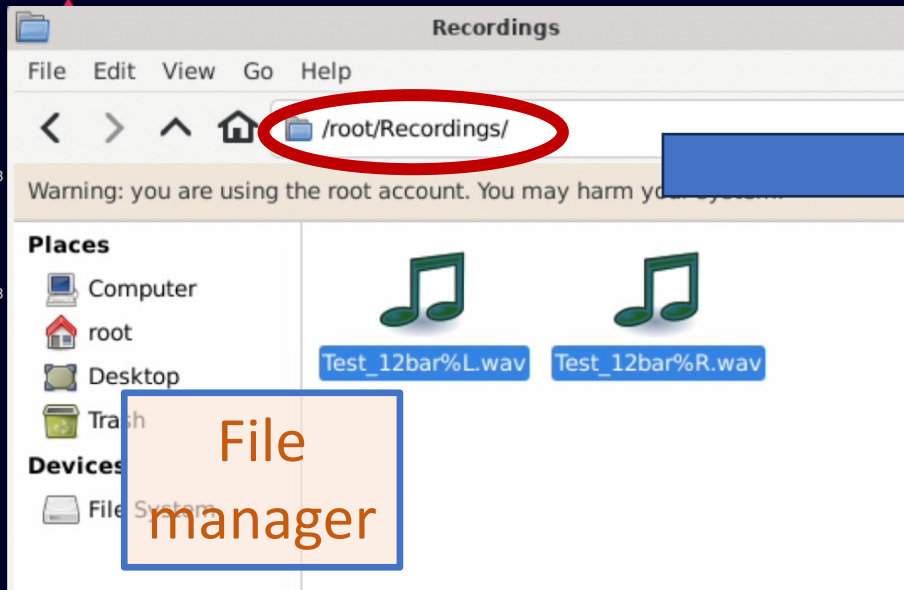
Connect 15
players



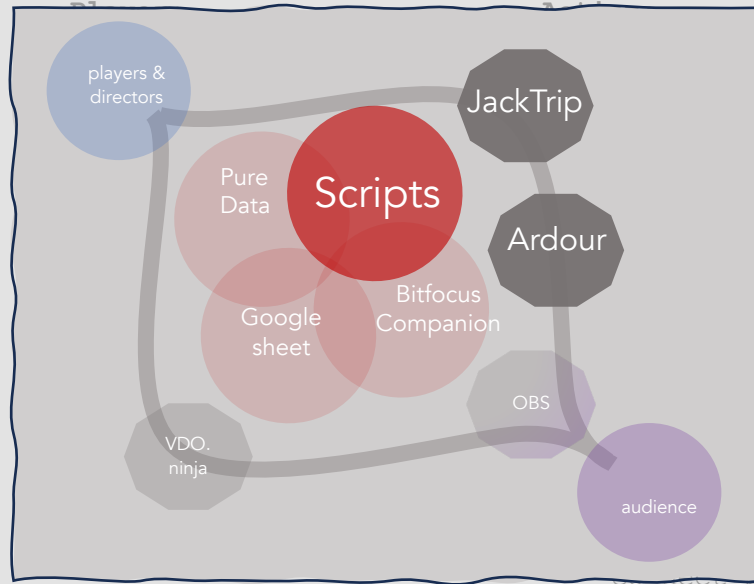
Connect 10
players

A web server

(preconfigured to provide a drop-box to export recordings and other files via the web)



Here are the scenarios the function can encounter when it evaluates a Player.



Puzzler : It was hard to bring people into the mixer and extra hard if they dropped off and needed to reconnect.

Connect-
Players
script

3 NOT in Jack? in Mixer? - remove from current_Mixer_connections

4 NOT in Jack? NOT in Mixer - do nothing

5 in Jack TWICE? in Mixer? - post duplicate-player alert,
- take the alert down when they disconnect

connect_PlayerN Function – Truth Table

Player in Jack?	Ardour DAW connected?	Jack receive_2 connected?	Jack send_2 connected?	JMess multi file for player?	Action:
yes	yes	---	---	---	do nothing
yes	no	yes	---	no	connect player - 2 in x 2 out
yes	no	yes	---	yes	connect player - 2 in x 2 out – multi-channel
yes	no	no	yes	no	connect player - 1 in x 2 out
yes	no	no	yes	yes	connect player - 1 in x 2 out – multi-channel
yes	no	no	no	no	connect player - 1 in x 1 out
yes	no	no	no	yes	connect player - 1 in x 1 out – multi-channel
no	yes	---	---	---	do housekeeping
no	no	---	---	---	do nothing
yes TWICE	---	---	---	---	post duplicate-player alert



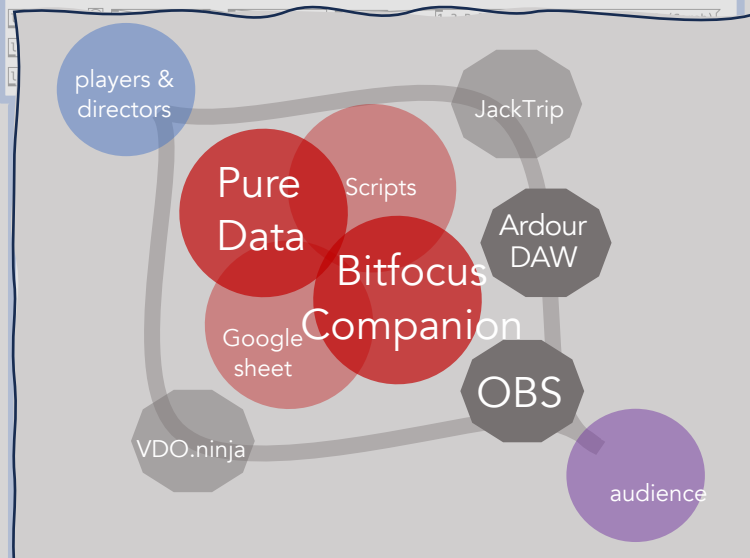
File Edit View Terminal Tabs Help

```
Player1_  
Player2_  
Player3_  
Player4_CONNECTED_2-in_2-out_  
Player5_CONNECTED_2-in_2-out_  
Player6_  
Player7_  
Player8_CONNECTED_2-in_2-out_  
Player9_  
Player10_  
Player11_  
Player12_  
Player13_  
Player14_CONNECTED_2-in_2-out_  
Player15_  
_
```

Looking for Players entering or leaving - use ctrl-c to stop

delayLoop is 1

loadbang [Scene-switcher] unpack f s [Pre-Show] 0.3 Pre-Show
loadbang [Scene-switcher] unpack f s [Intro] 0.7 Introduction



Symbol James
Player8
James

Symbol Katherine
Player18
Katherine

Symbol Steve
Player9
Steve

Symbol Diane
Player10
Diane

Player18
Katherine

Player19
Steve

Player20
Diane

Send cues to chat on first scene in a group (ends in .3) - via XM - midi notes sent to IAS XM IN |
route 0.3 1.3 2.3 3.3 4.3 5.3 6.3 7.3 8.3 9.3 10.3 11.3 12.3 13.3 14.3 15.3 16.3 17.3 18.3 19.3 20.3 21.3
29.3 30.3 31.3 32.3

0 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24)

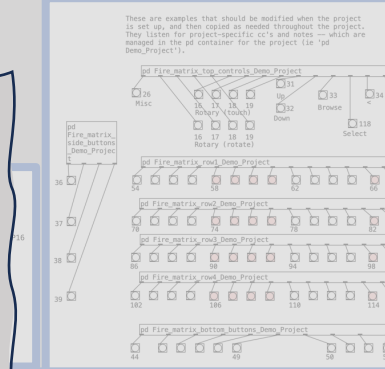
Send scene-specific mutes -- 10 seconds after scene-launch for sub-group (mute) scenes, immediately for
1.5
mute-switcher-in_Project

unpack strip fader

echo Debug

unpack

print to-ardour



loadbang ☐ scene-switcher unpack + s Pre-Show 0.3 Pre-Show

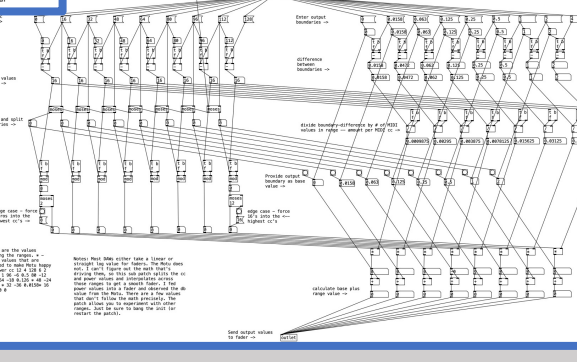
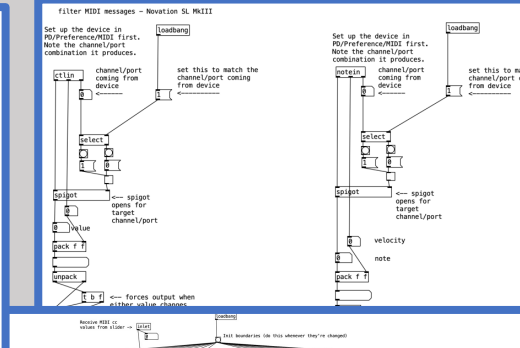
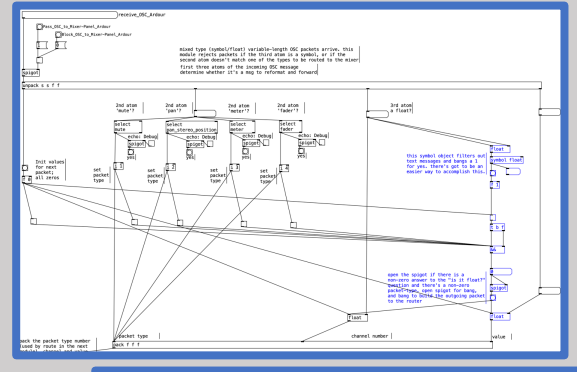
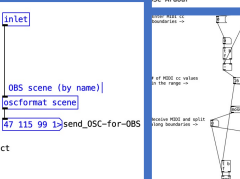
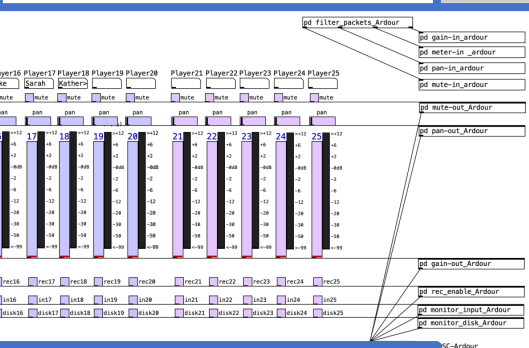
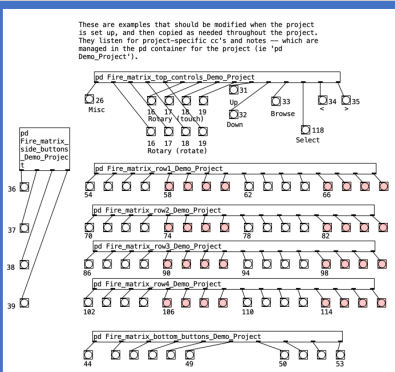
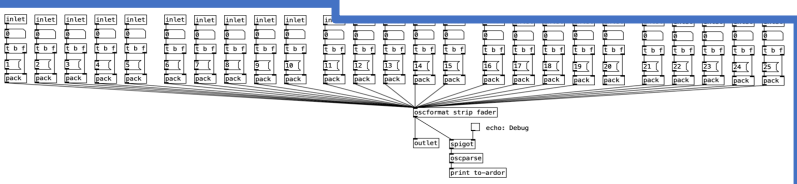
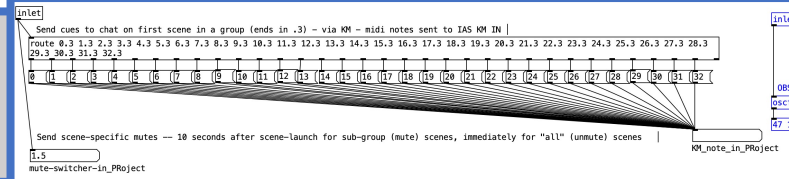
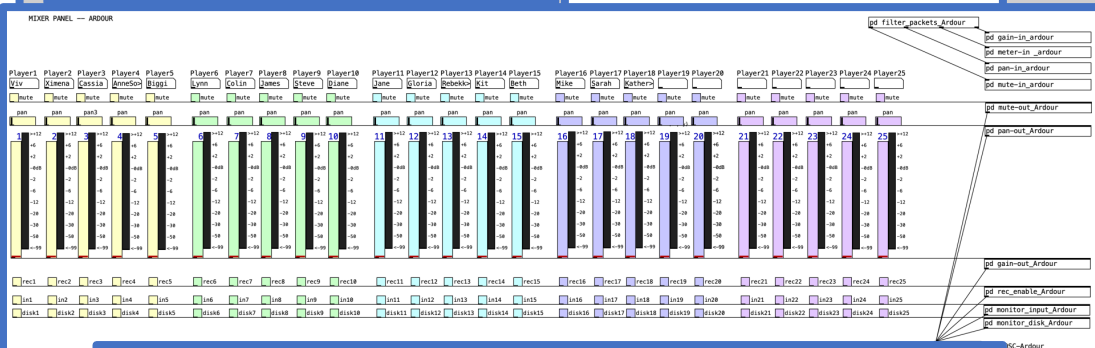
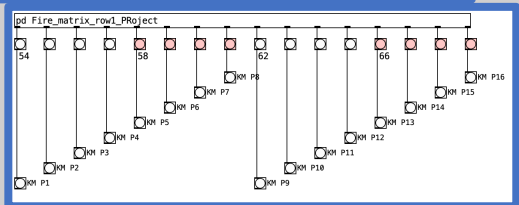
loadbang ☐ scene-switcher unpack + s Intro 0.7 Introduction

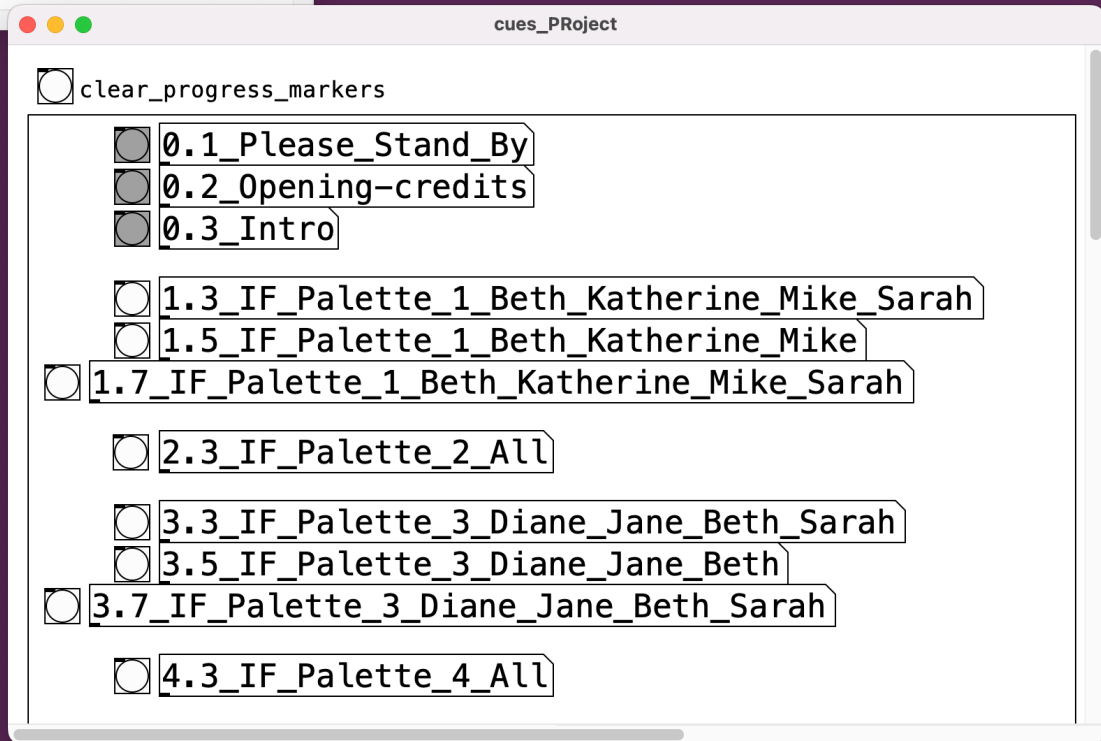
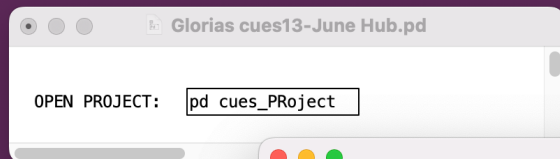
loadbang ☐ scene-switcher unpack + s Palettes 1.3 Palette-1-Players-14-15-16-18-(Sarah)

loadbang ☐ scene-switcher unpack + s Palettes 1.5 Palette-1-Players-14-15-16-18-(no-Sarah)

loadbang ☐ scene-switcher unpack + s Palettes 1.7 Palette-1-Players-14-15-16-18-(Sarah)

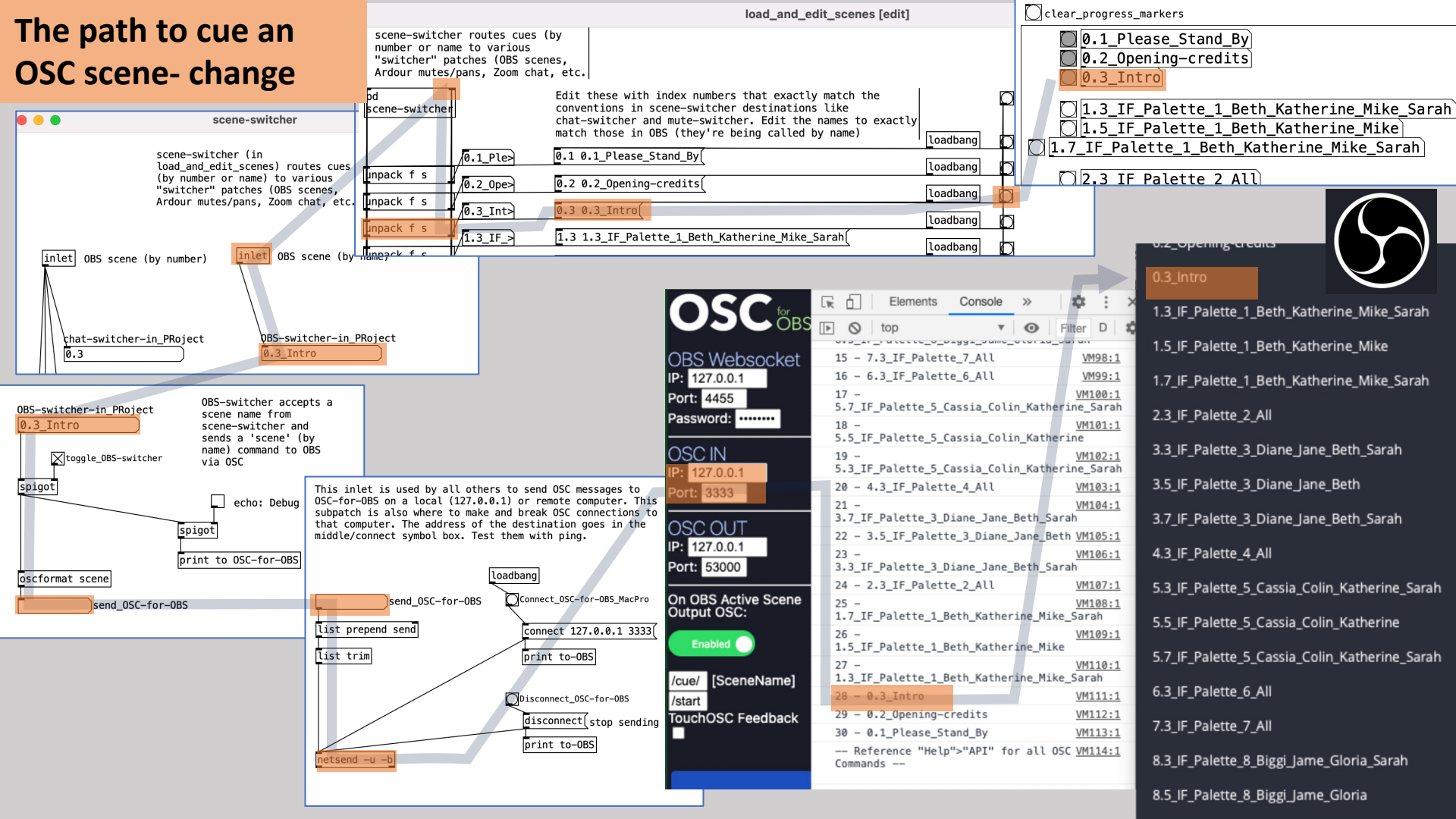
Symbol Viv	Symbol Jane
Player1	Player11
Viv	Jane
Symbol Ximena	Symbol Gloria
Player2	Player12
Ximena	Gloria
Symbol Cassia	Symbol Rebekkah
Player3	Player13
Cassia	Rebekkah
Symbol AnneSoph	Symbol Kit
Player4	Player14
AnneSoph	Kit
Symbol Biggi	Symbol Beth
Player5	Player15
Biggi	Beth
Symbol Lynn	Symbol Mike
Player6	Player16
Lynn	Mike
Symbol Colin	Symbol Sarah
Player7	Player17
Colin	Sarah
Symbol James	Symbol Kathern
Player8	Kathern
Symbol Steve	Symbol
Player9	Player19
Steve	
Symbol Diane	Symbol
Player10	Player20
Diane	



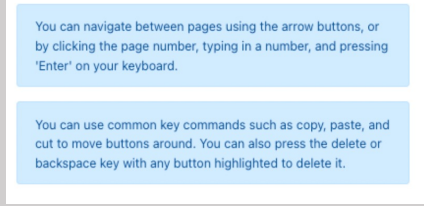
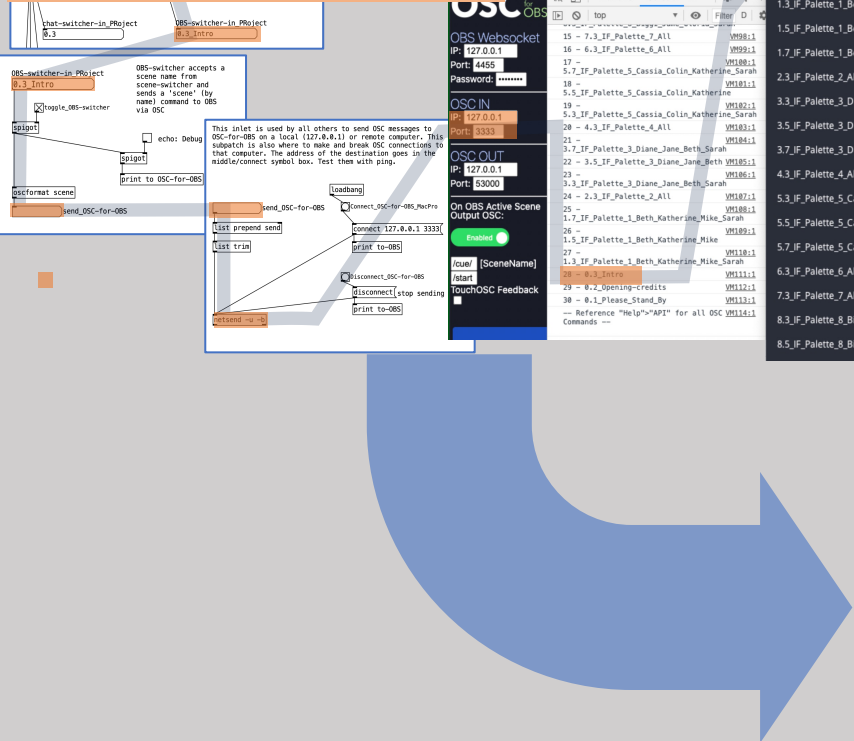


Here's the
director view

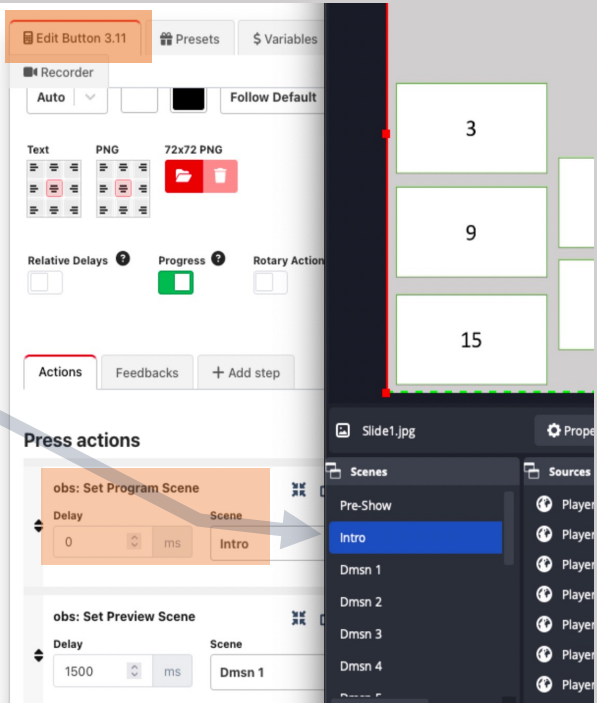
The path to cue an OSC scene- change



Rev 2 – a better way...

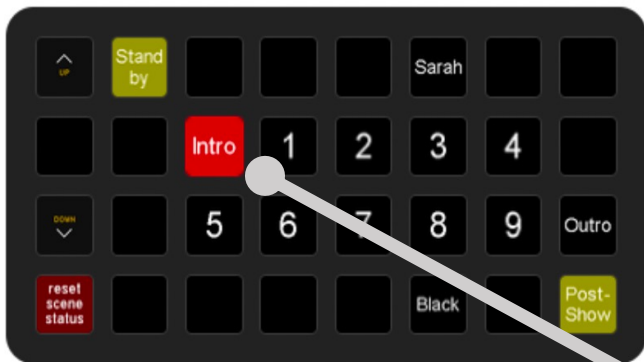


Companion



Rev 2 – a better way...

sent each button on your Streamdeck. Click on want them to look, and what they should do on them.



Copy Move Delete

Wipe page Reset page buttons

You can navigate between pages using the arrow buttons, or by clicking the page number, typing in a number, and pressing 'Enter' on your keyboard.

You can use common key commands such as copy, paste, and cut to move buttons around. You can also press the delete or backspace key with any button highlighted to delete it.

Edit Button 3.11

Presets

Variables

Recorder

Auto

Follow Default

Text

PNG

72x72 PNG

Relative Delays ?

Progress ?

Rotary Action

Actions

Feedbacks

+ Add step

Press actions

obs: Set Program Scene

Delay

0

Scene

ms

Intro

obs: Set Preview Scene

Delay

1500

ms

Scene

Dmsn 1

Slide1.jpg

Properties

Scenes

Sources

Pre-Show

Intro

Dmsn 1

Dmsn 2

Dmsn 3

Dmsn 4

Dmsn 5

Player

Player

Player

Player

Player

Player

Player



For
Director:
Scene Cues
and Player-
mutes



For Players:
Current
scene, tech-
status and
who's-muted
info

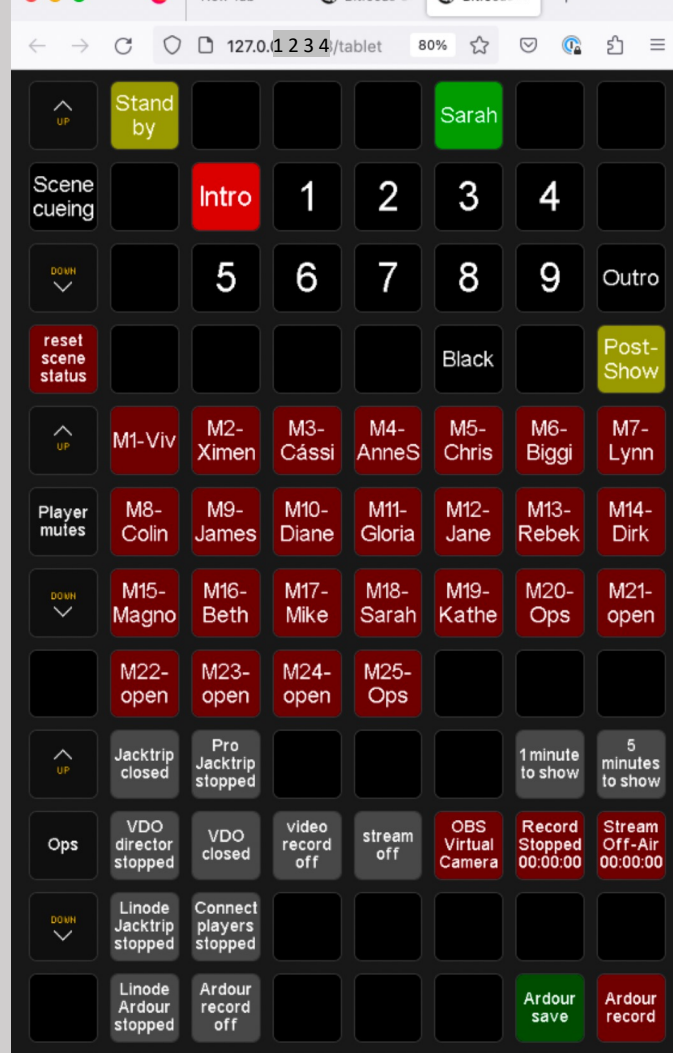
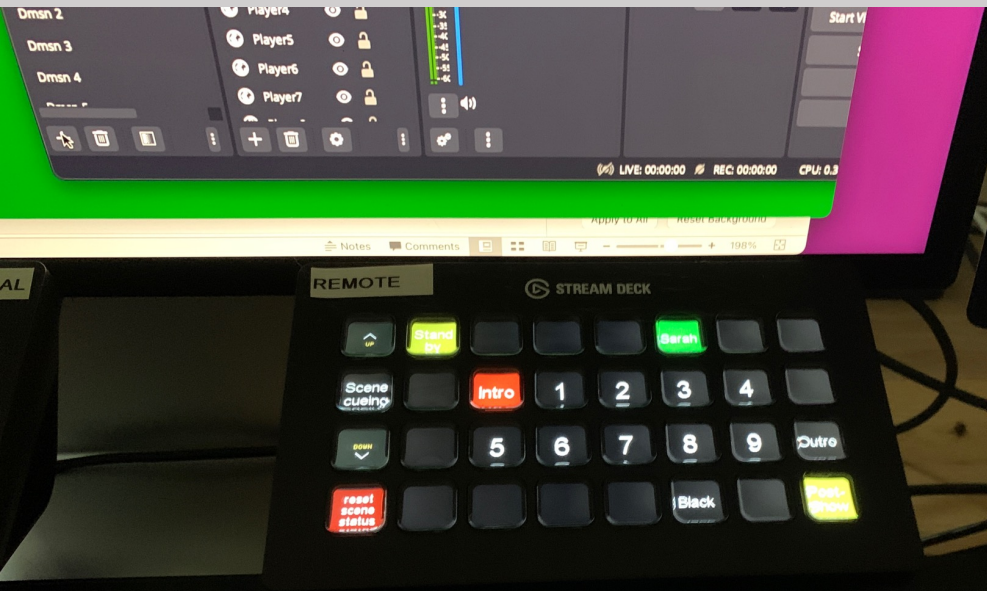


For Ops:
Technical
cues

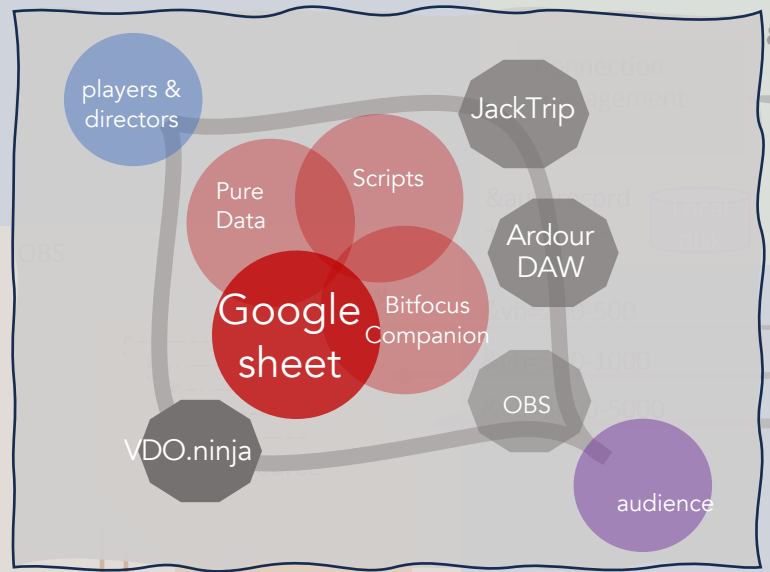
BITFOCUS



Companion



Server

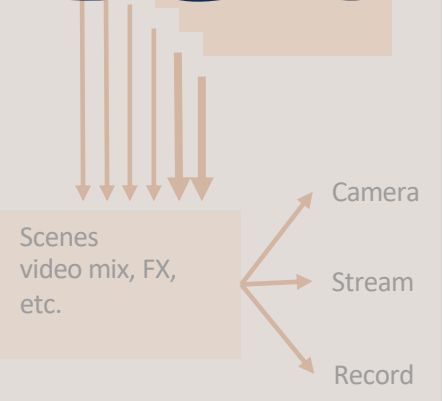


Chrome - room - director

Network connections

&room + &push
(once per player)

Puzzler: Zoom video is... Zoom video. How could we get beyond that?

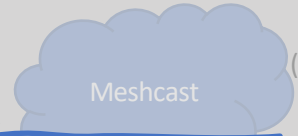


Chrome - room - director

Director's feed

&push or...

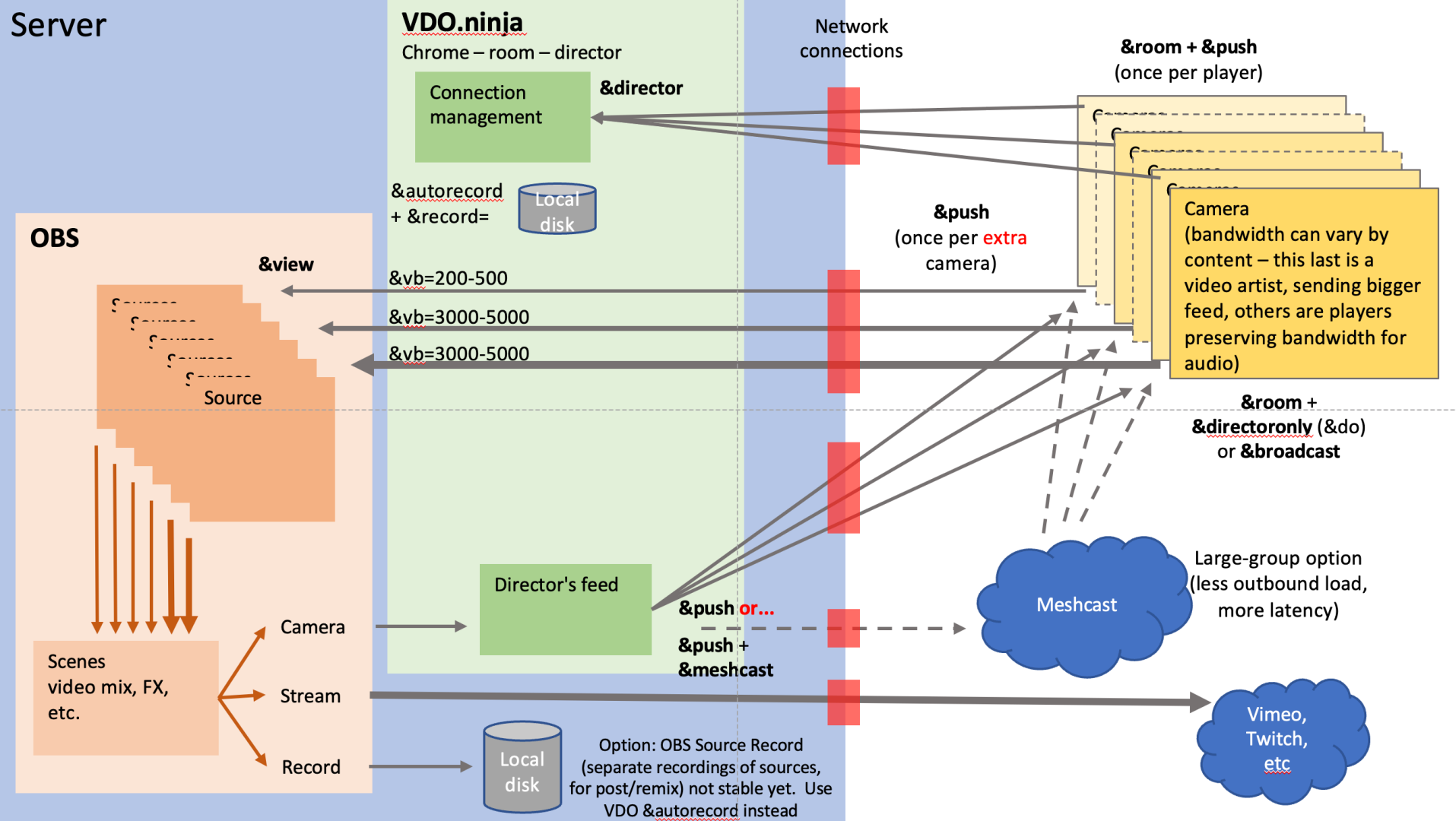
VDO.ninja

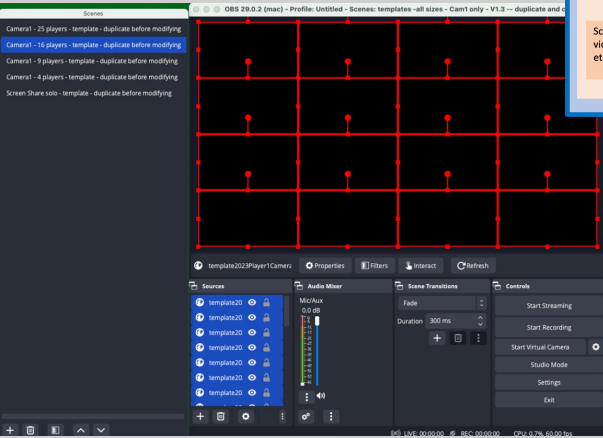


Large-group option
(less outbound load,
more latency)

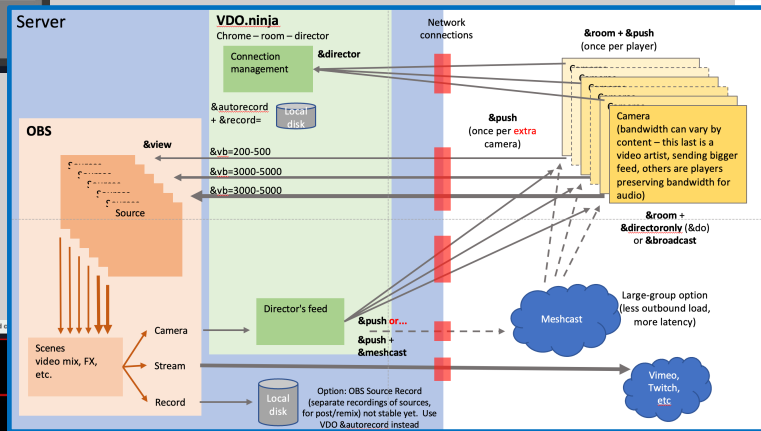


Option: OBS Source Reto...
(separate recording of scenes, for post/remix) not stable yet. Use VDO & autorecord instead

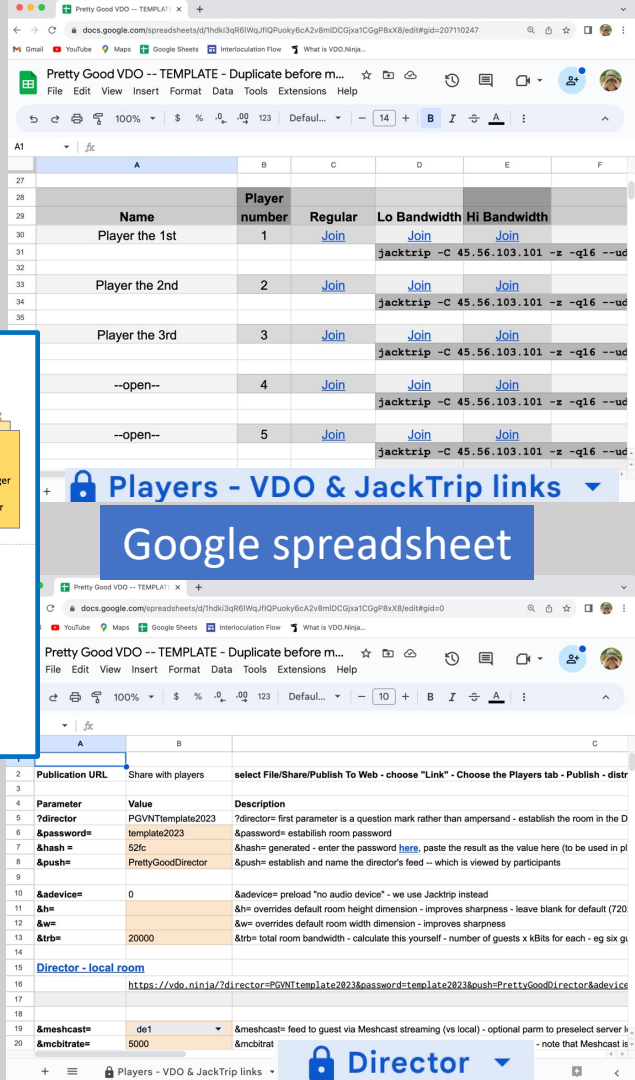




Brings network video into OBS
and sends OBS video mix back to players



Mixes and streams video



Google spreadsheet interface showing a table with columns A through F. The table contains data for three players, each with a name, number, and links for Regular, Lo Bandwidth, and Hi Bandwidth. The interface includes a menu bar (File, Edit, View, Insert, Format, Data, Tools, Extensions, Help) and a toolbar with various editing and formatting options.

	A	B	C	D	E	F
27						
28		Player				
29	Name	number	Regular	Lo Bandwidth	Hi Bandwidth	
30	Player the 1st	1	Join	Join	Join	
31				jacktrip -C		-q16 --ud
32						
33	Player the 2nd	2	Join	Join	Join	
34				jacktrip -C		-q16 --ud
35						
36	Player the 3rd	3	Join	Join	Join	
37				jacktrip -C		-q16 --ud
38						
39	-open--	4	Join	Join	Join	
40				jacktrip -C		-q16 --ud
41						
42	-open--	5	Join	Join	Join	
43				jacktrip -C		-q16 --ud
44						

Players - VDO & JackTrip links

Google
spreadsheet

Google spreadsheet

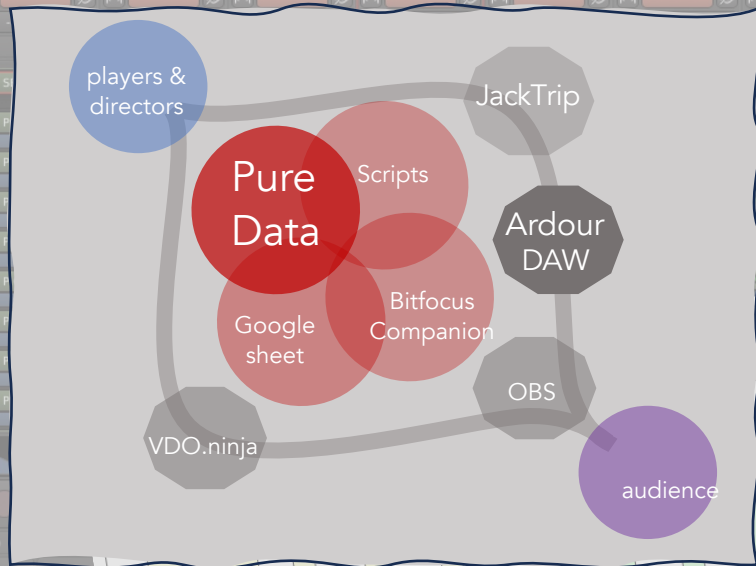
Pretty Good VDO -- TEMPLATE - Duplicate before m...

File Edit View Insert Format Data Tools Extensions Help

100% 123 Defaul... 10 B I A

	A	B	
1			
2	Publication URL	Share with players	select File/Share/Publish To Web - choose "Link" - Choose the Players tab
3			
4	Parameter	Value	Description
5	?director		?director= first parameter is a question mark rather than ampersand - establish the room in the D
6	&password=		&password= establish room password
7	&hash =		&hash= generated - enter the password here , paste the result as the value here (to be used in pl
8	&push=		&push= establish and name the director's feed -- which is viewed by participants
9			
10	&adevice=	0	&adevice= preload "no audio device" - we use Jacktrip instead
11	&h=		&h= overrides default room height dimension - improves sharpness - leave blank for default (720
12	&w=		&w= overrides default room width dimension - improves sharpness
13	&trb=	20000	&trb= total room bandwidth - calculate this yourself - number of guests x kBits for each - eg six gu
14			
15	Director - local room		
16		https://vdo.ninja/?director=	
17			
18			
19	&meshcast=	de1	&meshcast= feed to guest via Meshcast streaming (vs local) - optional parm to preselect server l
20	&mcbirate=	5000	&mcbirate= specifies the per-viewer bitrate - 2400 kBits/sec is the default - note that Meshcast is

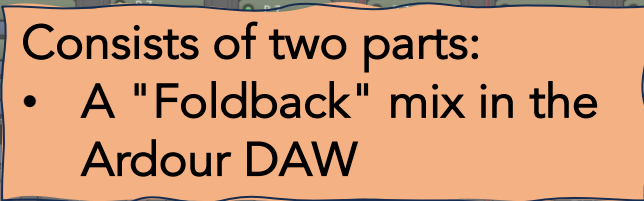
Players - VDO & JackTrip links Director Grids M

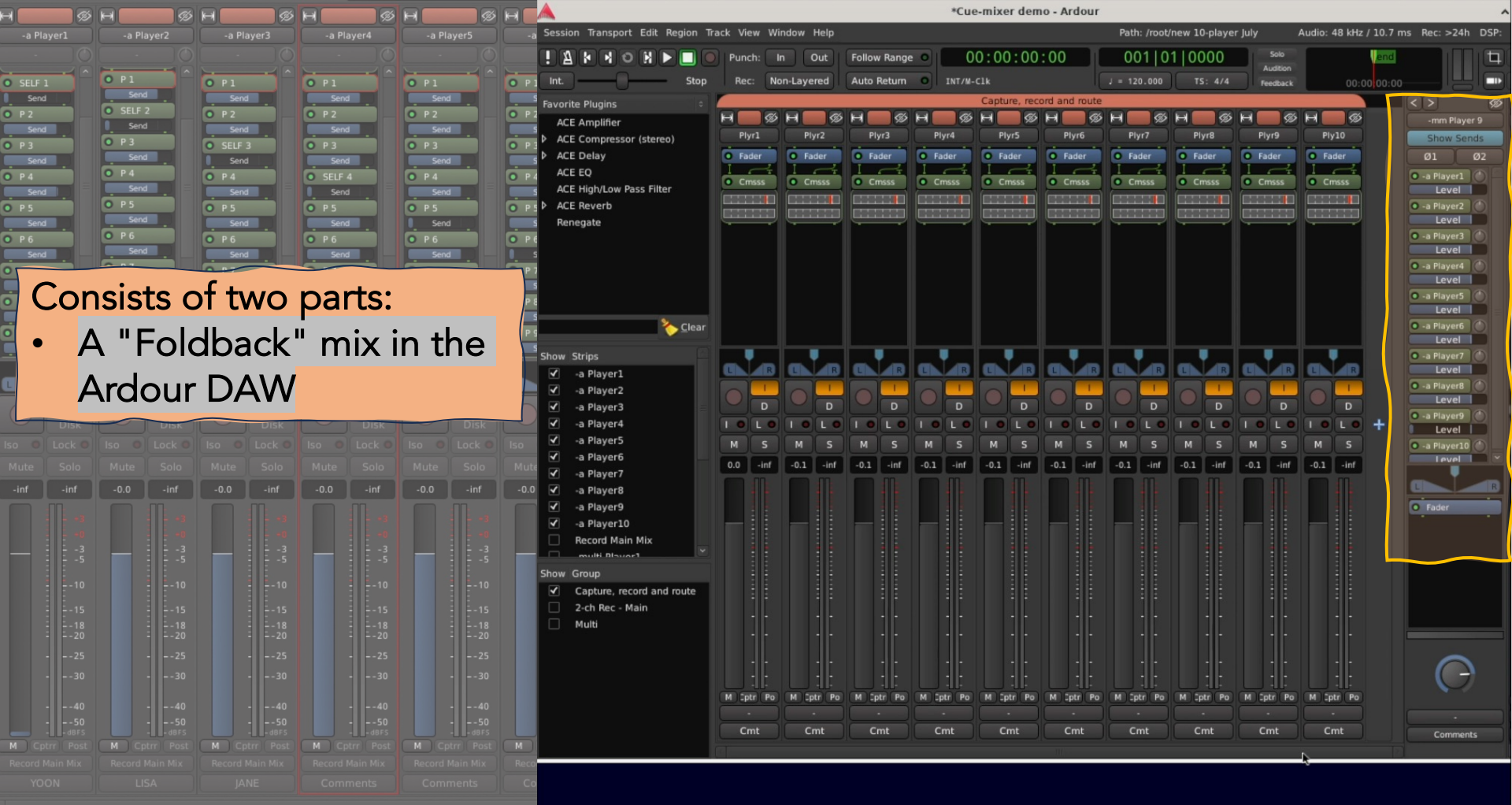


Puzzler: Performers wanted custom cue (monitor) mixes. They rely on them in peer-to-peer apps like Sonobus (and recording studios).

- 1) Click the box darker outline)
- 2) Type the number (three dots will appear)
- 3) Type the Return or Enter key

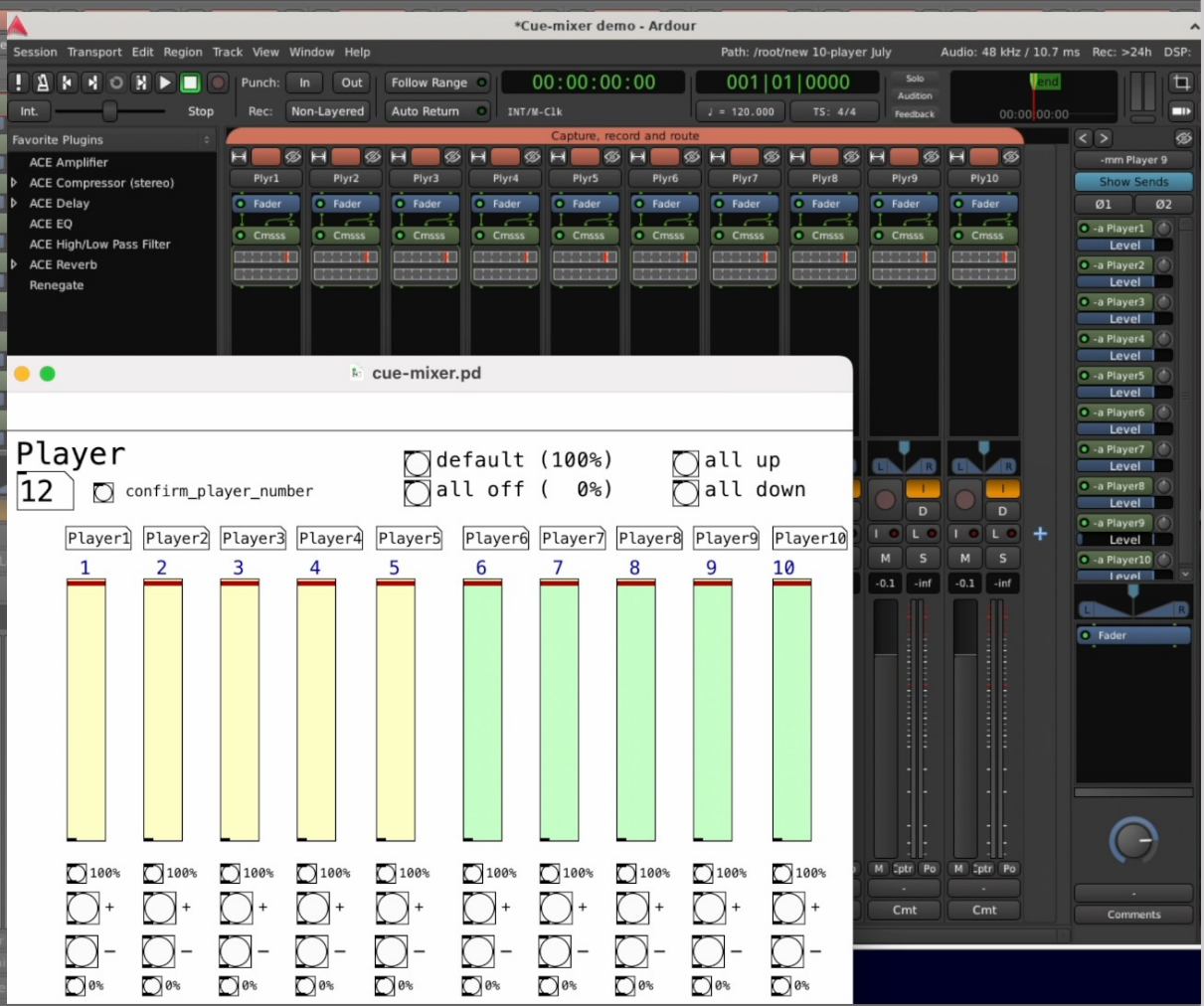
Custom cue/monitor-mixing





Consists of two parts:

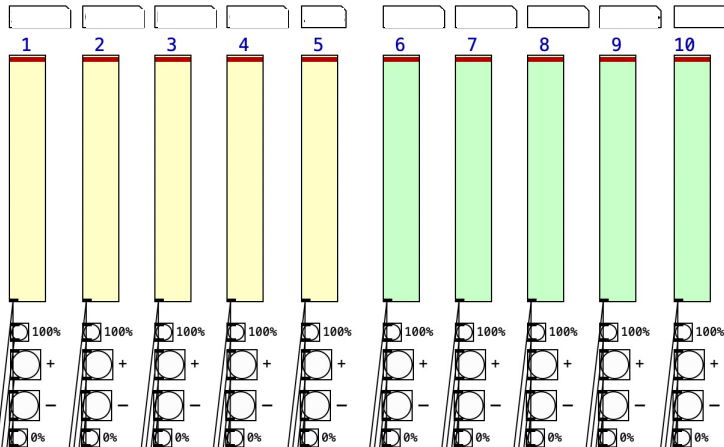
- A "Foldback" mix in the Ardour DAW
- A desktop interface for each Player (a PD patch derived from Gloria's Cues)



0 mm_player_number
 set \$1 ☐ reload last session at startup
 12 Stores Player number for next session

Player

12 ☐ confirm_player_number ☐ default (100%) ☐ all up
☐ all off (0%) ☐ all down



loadbang

☐ reload last session at startup

pd update_player_number

pd configure_player_names

pd configure_and_check_OSC

pd mm_gain-out_Ardour

send_OSC-Ardour

canvas object --
 set properties for
 graph-on-parent
 here

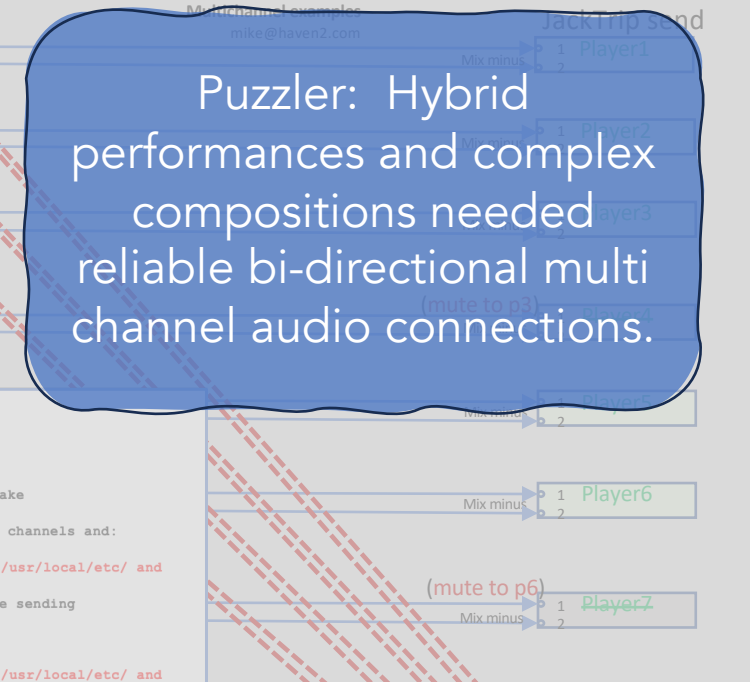
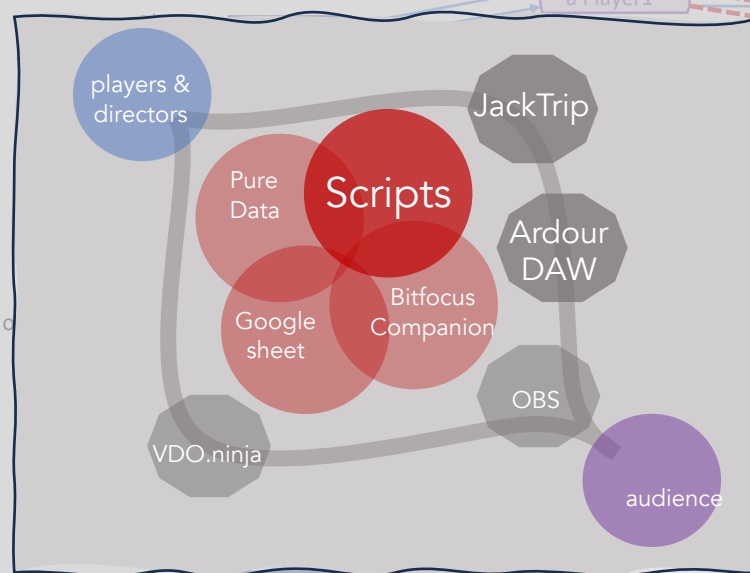
Todo: simultaneous connections?, replace db
 scale, separate pd files for each player?,
 reset button, "gas station" to load patches
 for performers

JackTrip receive

Arduour mixer

Multi-channel

JackTrip send



Puzzler: Hybrid performances and complex compositions needed reliable bi-directional multi channel audio connections.

Player skipped, occupied by Player 6

Player receiving

- green box – player's JackTrip connection (inbound and outbound)

- grey box – not in use

- purple box – Player mixing channels – Ardour

- red box – Player multi channels – Ardour

Multi Channel

```
2.b send_2 connected? - we're sending 2 channels
- connect player - 1 in x 2 out
- add to current Mixer connections
- file for this Player in /usr/local/etc/ and

3 NOT in Jack
Player2 CONNECTED Multichannel_using /usr/local/etc/MultiExample_Jmess_Player2_multi.xml
4 NOT in Jack
Player3 CONNECTED Multichannel_using /usr/local/etc/MultiExample_Jmess_Player3_multi.xml
Player4
Player7
Player8 CONNECTED Multichannel_using /usr/local/etc/MultiExample_Jmess_Player8_multi.xml
Player9
Player10
Player11
```

connect_PlayerN Function – Truth Table

Player in Jack?	Ardour DAW connected?	Jack receive_2 connected?	Jack send_2 connected?	JMess multi file for player?	Action:
yes	yes	---	---	---	do nothing
yes	no	yes	---	no	connect player - 2 in x 2 out
yes	no	yes	---	yes	connect player - 2 in x 2 out – multi-channel
yes	no	no	yes	no	connect player - 1 in x 2 out
yes	no	no	yes	yes	connect player - 1 in x 2 out – multi-channel
yes	no	no	no	no	connect player - 1 in x 1 out
yes	no	no	no	yes	connect player - 1 in x 1 out – multi-channel
no	yes	---	---	---	do housekeeping
no	no	---	---	---	do nothing
yes TWICE	---	---	---	---	post duplicate-player alert

A special case of the Connect_Players script

connect_PlayerN Function – Truth Table

Player in Jack?	Ardour DAW connected?	Jack receive_2 connected?	Jack send_2 connected?	JMess multi file for player?	Action:
yes	yes	---	---	---	do nothing
no	no	---	---	---	do nothing
yes TWICE	---	---	---	---	post duplicate-player alert

Terminal -

>_

File Edit View Terminal Tabs Help

Player1_CONNECTED_Multichannel_using_/usr/local/etc/MultiExample_Jmess_Player1_multi.xml
Player2_CONNECTED_Multichannel_using_/usr/local/etc/MultiExample_Jmess_Player2_multi.xml
Player3_CONNECTED_Multichannel_using_/usr/local/etc/MultiExample_Jmess_Player3_multi.xml
Player4_---
Player5_CONNECTED_2-in_2-out_---
Player6_CONNECTED_Multichannel_using_/usr/local/etc/MultiExample_Jmess_Player6_multi.xml
Player7_---
Player8_CONNECTED_Multichannel_using_/usr/local/etc/MultiExample_Jmess_Player8_multi.xml
Player9_---
Player10_---
Player11_---

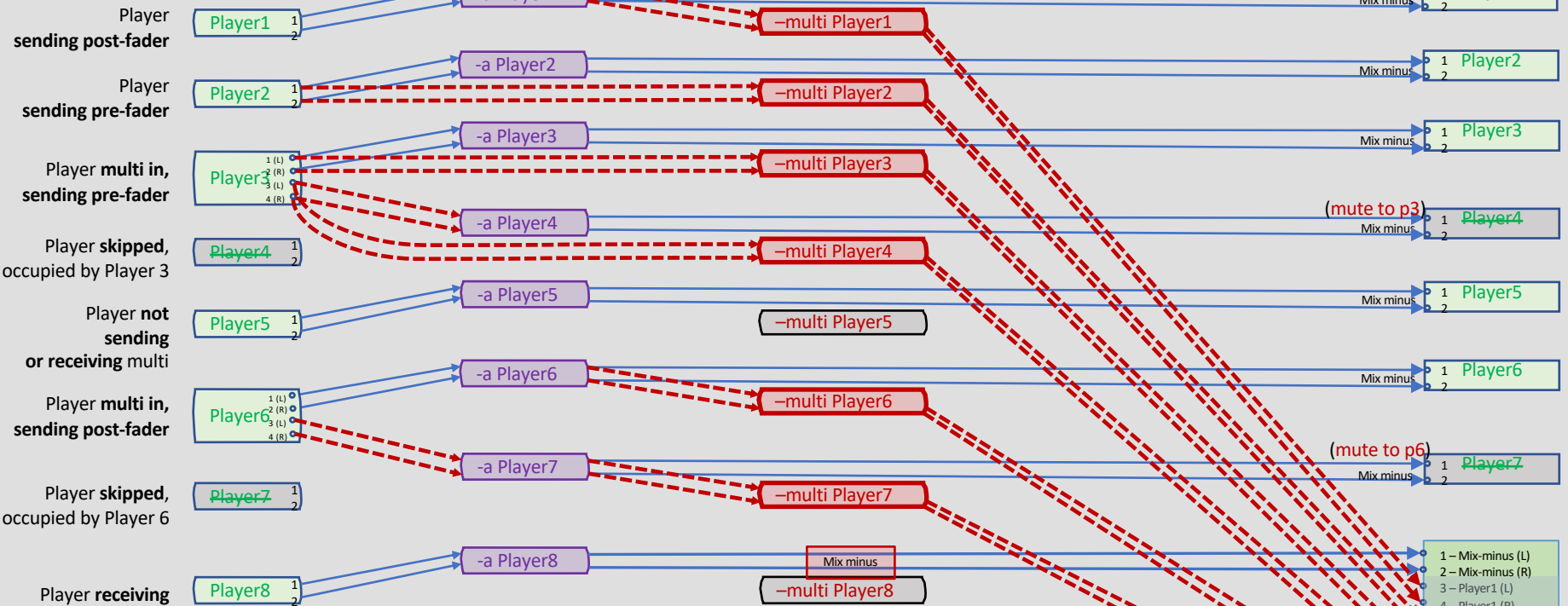
JackTrip receive

Arduour mixer

Multi-channel

Multichannel examples mike@haven2.com

JackTrip send



- green box – player's JackTrip connection (inbound and outbound)

- grey box – not in use

- purple box – Player mixing channels – Arduour

- red box – Player multi channels – Arduour

- blue solid line – connection made by the connect_players script when the player connects

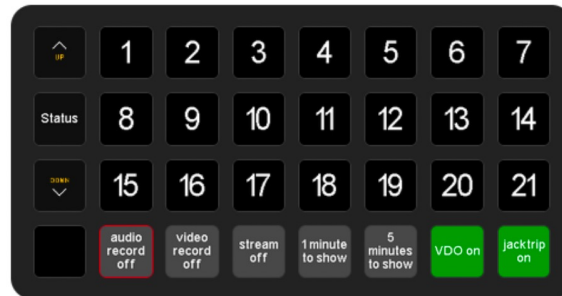
- red dotted line – Player connection made by the connect_players script if a JMess XML file for the player exists in /usr/local/etc/ (it's possible that players will send AND receive)

- 1 – Mix-minus (L)
 - 2 – Mix-minus (R)
 - 3 – Player1 (L)
 - 4 – Player1 (R)
 - 5 – Player2 (L)
 - 6 – Player2 (R)
 - 7 – Player3 (L)
 - 8 – Player3 (R)
 - 9 – Player4 (L)
 - 10 – Player4 (R)
 - 11 – Player5 (L)
 - 12 – Player5 (R)
 - 13 – Player6 (L)
 - 14 – Player6 (R)
- Player8

Buttons

The squares below represent each button on your Streamdeck. Click on them to set up how you want them to look, and what they should do when you press or click on them.

< 1 > Status Export page



Copy Move Delete

Wipe page Reset page buttons

You can navigate between pages using the arrow buttons, or by clicking the page number, typing in a number, and pressing 'Enter' on your keyboard.

You can use common key commands such as copy, paste, and cut to move buttons around. You can also press the delete or backspace key with any button highlighted to delete it.

Edit Button 1.26

Presets

Variables

Recorder



Button text string

audio record off

Font size

Auto

Text



BG



Topbar

Follow Default

Text



PNG



72x72 PNG



Relative Delays



Progress



Rotary Actions



Actions

Feedbacks

+ Add step

Press actions

+ Add press action

Release actions

+ Add key release action

+ Add duration group

Status buttons:

No actions

Background-color and button-text changes are sent from buttons on other pages.

Connections

Buttons

Surfaces

Triggers

Settings

Import / Export

Log

Buttons

The squares below represent each button on your Streamdeck. Click on them to set up how you want them to look, and what they should do when you press or click on them.

< 2

Who's mut

Export page

↑

M1-Viv

M2-Ximena

M3-Cassia

M4-AnneSo

M5-Chris

M6-Biggl

M7-Lynn

Who's muted?

M8-Colin

M9-James

M10-Diane

M11-Gloria

M12-Jane

M13-Rebekkah

M14-Dirk

↓

M15-Magno

M16-Beth

M17-Mike

M18-Sarah

M19-Katherine

M20-Ops

M21-open

M22-open

M23-open

M24-open

M25-Ops Server

Copy

Move

Delete

Wipe page

Reset page buttons

You can navigate between pages using the arrow buttons, or by clicking the page number, typing in a number, and pressing 'Enter' on your keyboard.

You can use common key commands such as copy, paste, and cut to move buttons around. You can also press the delete or backspace key with any button highlighted to delete it.

Edit Button 1.26

Presets

Variables

Recorder

audio record off

Button text string

audio record off

A

Font size

Text

BG

Topbar

Text

Auto

Follow Default

PNG

72x72 PNG

Relative Delays

Progress

Rotary Actions

Actions

Feedbacks

+ Add step

Press actions

+ Add press action

Release actions

+ Add key release action

+ Add duration group

Who's-muted?
buttons:

No actions.

Background-color
changes are sent
from buttons on
another page.

Player-name
button-text
changes are sent
via a Pd script
(currently Sarah's
Mixer)

Buttons

The squares below represent each button on your Streamdeck. Click on them to set up how you want them to look, and what they should do when you press or click on them.

3 Scenes Export page

Stand by Sarah Scene cueing Intro 1 2 3 4 5 6 7 8 9 Outro reset scene status Black Post-Show

Copy Move Delete Wipe page Reset page buttons

You can navigate between pages using the arrow buttons, or by clicking the page number, typing in a number, and pressing 'Enter' on your keyboard.

You can use common key commands such as copy, paste, and cut to move buttons around. You can also press the delete or backspace key with any button highlighted to delete it.

Edit Button 3.12 Presets 5 Variables Recorder

Auto Follow Default

Relative Delays Progress Rotary Actions

Actions Feedbacks Add step

Press actions

obs: Set Program Scene

Delay 0 ms Scene Dimen 1

obs: Set Preview Scene

Delay 1500 ms Scene Dimen 2

Internal: Button: Trigger press and release

Delay 0 ms

reset scene status

Use variables for page

Page This page

Use variables for button

Button 25

Force press if already pressed

Internal: Button: Set background color

Delay 0 ms

1

Background Color

Use variables for page

Page 1 (Status)

Use variables for button

Button 2

+ Add press action

Release actions

+ Add key release action

+ Add duration group

Scene-cueing buttons:

Actions:

obs: Set Program Scene

obs: Set Preview Scene

internal: trigger a local button to clear the background color of the all the status buttons on the Status page

internal: set background color of the status button on the Status page

Buttons

The squares below represent each button on your Streamdeck. Click on them to set up how you want them to look, and what they should do when you press or click on them.

4 Player mutes Export page

Buttons: M1-Viv, M2-Ximen, M3-Cassi, M4-AnneS, M5-Chris, M6-Biggi, M7-Lynn, M8-Colin, M9-James, M10-Diane, M11-Gloria, M12-Jane, M13-Rebek, M14-Dirk, M15-Magno, M16-Beth, M17-Mike, M18-Sarah, M19-Kathe, M20-Ops, M21-open, M22-open, M23-open, M24-open, M25-Ops

Buttons: Copy, Move, Delete, Wipe page, Reset page buttons

You can navigate between pages using the arrow buttons, or by clicking the page number, typing in a number, and pressing 'Enter' on your keyboard.

You can use common key commands such as copy, paste, and cut to move buttons around. You can also press the delete or backspace key with any button highlighted to delete it.

Edit Button 4.2 Presets Variables Recorder

Button text string: M1-Viv

Font size: 24pt Text BG Topbar Follow Default Text PNG 72x72 PNG

Relative Delays Progress Rotary Actions

Step 1 2 Feedbacks

Press actions

osc-Ardour: Send message with multiple arguments Delay 0 ms OSC Path /strip/mute Arguments 11

Internal: Button: Set background color Delay 0 ms Background Color M1-Viv Use variables for page Page This page Use variables for button Button This button

Internal: Button: Set background color Delay 0 ms Background Color M1-Viv Use variables for page Page 2 (Who's muted?) Use variables for button Button This button

+ Add press action

Player-mute buttons:

Actions: **Step 1**

obs-Ardour: send OBS
– path is /strip/mute
arguments are
Player's channel
number, mute-on (1)

internal: set
background color of
the mute button on
the local-page

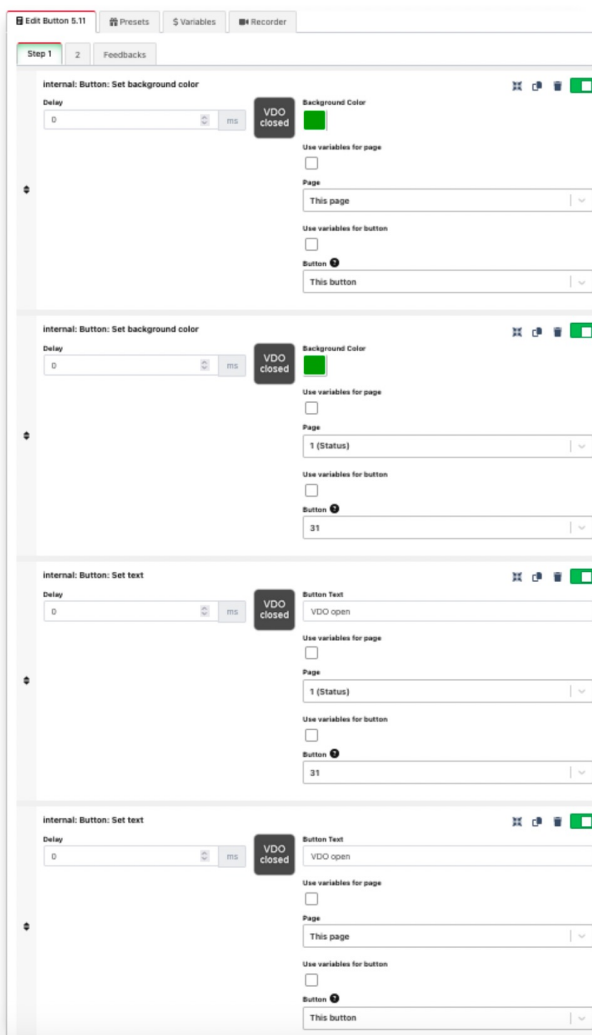
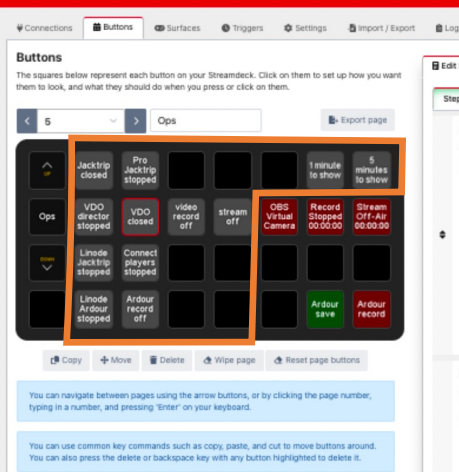
internal: set
background color of
the mute button on
the the Who's
Muted? page

Actions: **Step 2**

obs-Ardour: send OBS
– path is /strip/mute
arguments are
Player's channel
number, mute-off (0)

internal: set
background color of
the mute button on
the local-page

internal: set
background color of
the mute button on
the the Who's
Muted? page



Reminder/status buttons:

Actions: **Step 1**

internal: set background color of the button on the local page

internal: set background color of the button on the the Status page

internal: set button text on the local page

internal: set button text on the Status page

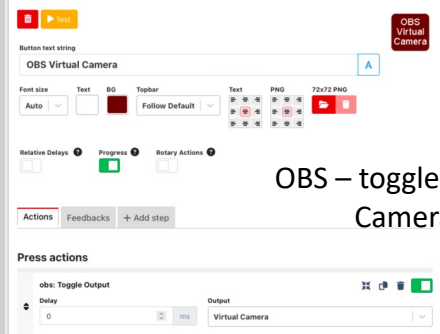
Actions: **Step 2**

internal: set background color of the button on the local page

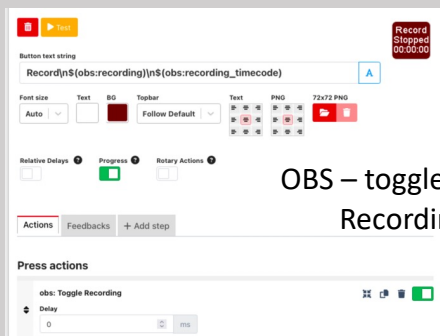
internal: set background color of the button on the the Status page

internal: set button text on the local page

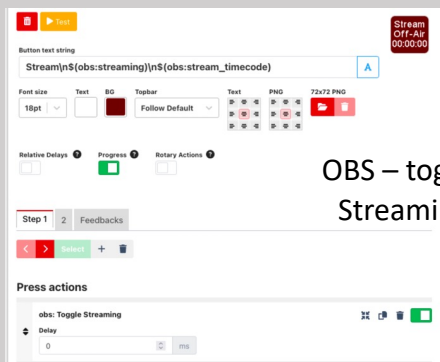
internal: set button text on the Status page



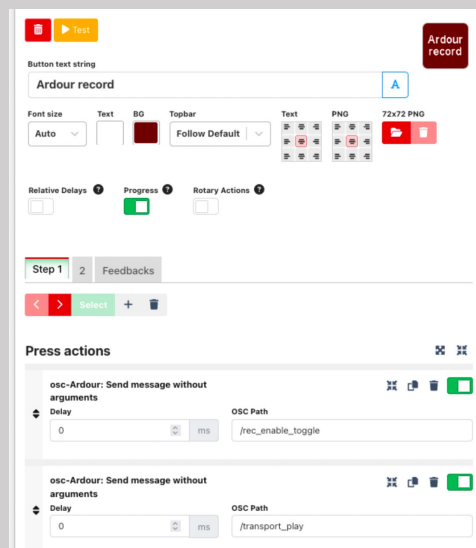
OBS – toggle Virtual Camera



OBS – toggle Video Recording



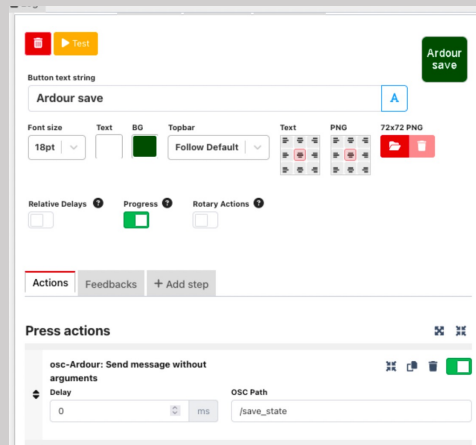
OBS – toggle Streaming



Arduour – toggle Record

obs-Ardour: send OBS – path is /rec_enable_toggle

obs-Ardour: send OBS – path is /transport_play



Arduour – Save the Session

obs-Ardour: send OBS – path is /save_state

Connections

When you want to control devices or software with Companion, you need to add a connection to let Companion know how to communicate with whatever you want to control.

Label	Module	Status	Disabled	OK	Warning	Error
obs	obs OBS	✓				
osc-Ardour	osc Generic	✓				
OSC_PD_BF_Companion_Send	osc Generic	✓				
midi-relay	midi-relay Tech Ministry	Connecting				
osc-Protokol	osc Generic	Disabled				

+ Add connection

⚙ Edit connection

osc configuration

Label

osc-Ardour

Target IP

Target Port

3819

Save

Cancel

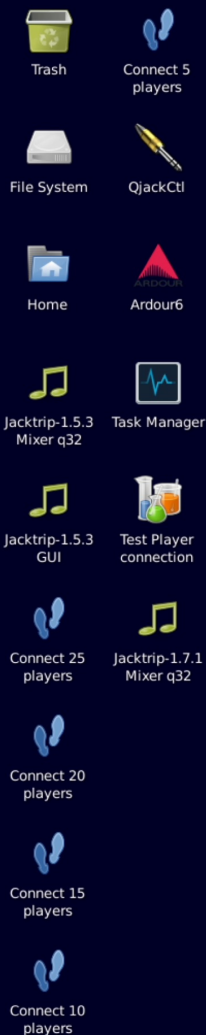
Connections:

Example – OSC connection to Ardour

Use the "osc Generic" module

Rename it – "osc-Ardour" in this example

Specify IP address and port



```
*/root/PGJTT-Main-Install_v3.1.5.sh - Mousepad
File Edit Search View Document Help

Warning: you are using the root account. You may harm your system.

#!/bin/bash

#####
#
# SECTION: Init
#
#####

# Version: 3.1.5      Author: Mike O'Connor   Date: 27-Feb, 2022
# Credits:
# Inspired by: https://help.jacktrip.org/hc/en-us/articles/1500009330002-Linode-1-Setup-Remote-Server-with
# First version built by: Ralph Jenson
# Community of supporters: Sarah Weaver and the Nownet Arts Hub ensemble

# Load a copy of this script into root's home directory - documentation

curl -o ~/PGJTT-Main-Install_v3.1.5.sh https://pgjtt.com/Scripts/PGJTT-Main-Install_v3.1.5.sh

# Install update-logs and status-file script

curl -o /usr/local/bin/PGJTT-update_logs-3.1.4.sh https://PGJTT.com/Scripts/PGJTT-update_log
chmod +x /usr/local/bin/PGJTT-update_logs-3.1.4.sh
```





Player

12

☐ confirm_player_number☐ default (100%)☐ all off (0%)☐ all up☐ all down

Player1

Player2

Player3

Player4

Player5

Player6

Player7

Player8

Player9

Player10

1

2

3

4

5

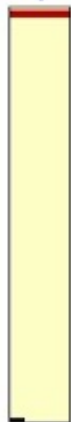
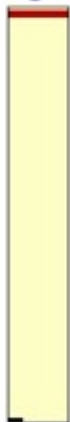
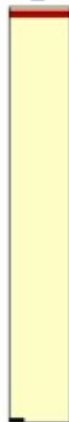
6

7

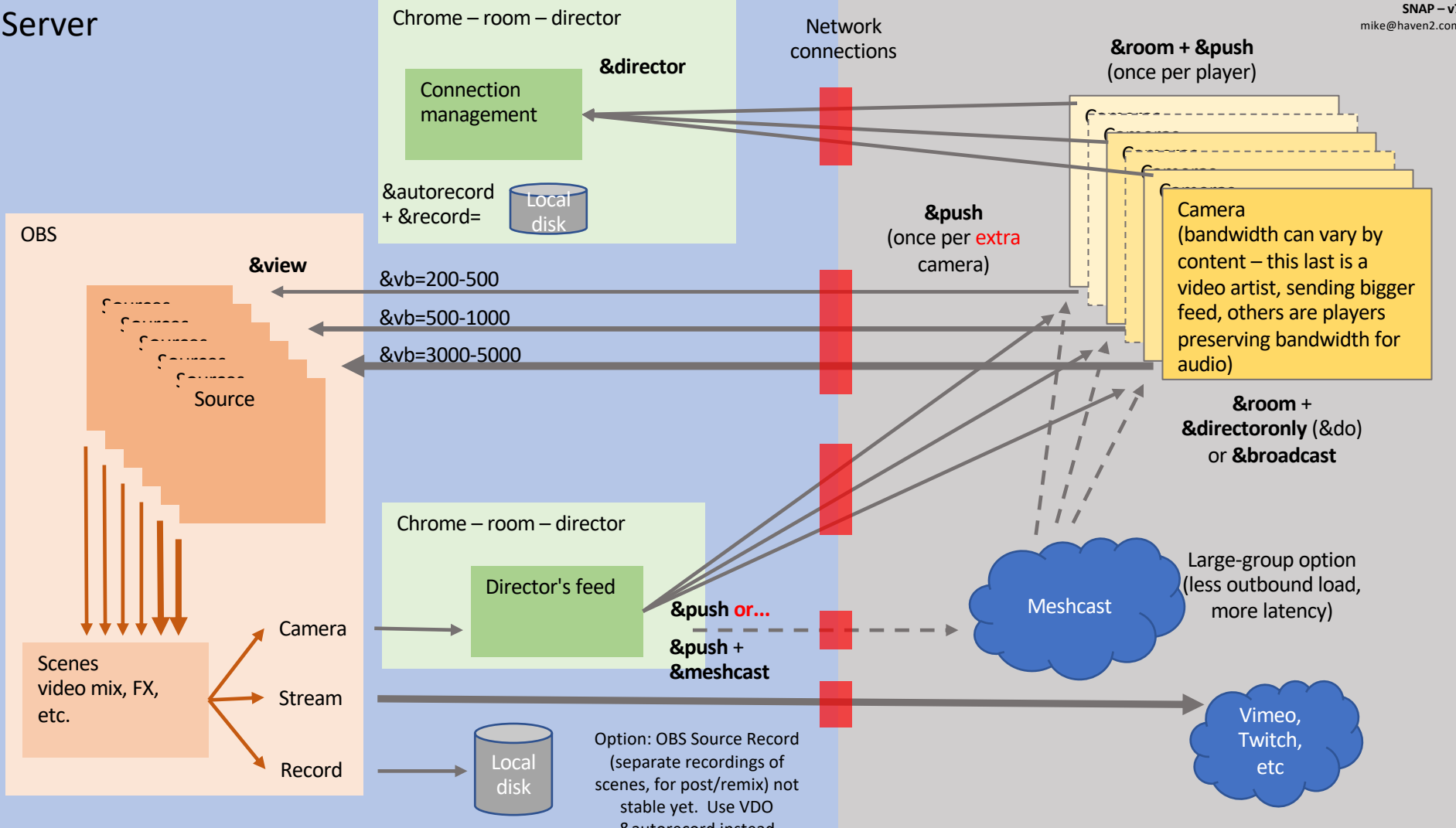
8

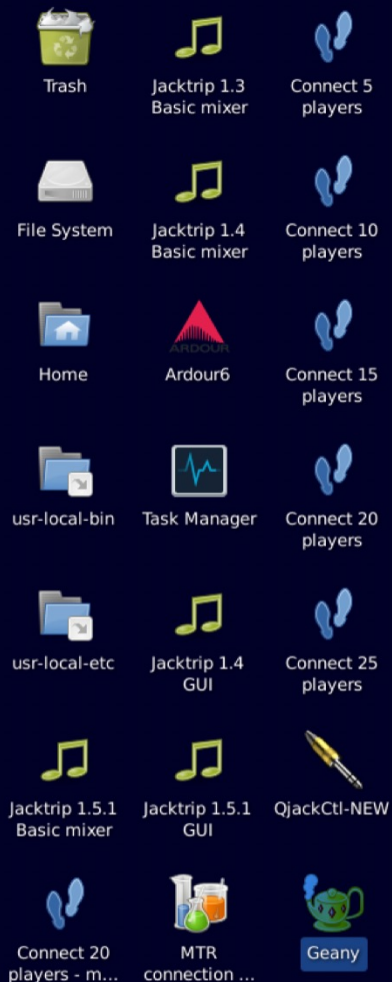
9

10

☐ 100%☐ 100%☐ 100%☐ 100%☐ 100%☐ 100%☐ 100%☐ 100%☐ 100%☐ 100%☐ 0%☐ 0%☐ 0%☐ 0%☐ 0%☐ 0%☐ 0%☐ 0%☐ 0%☐ 0%

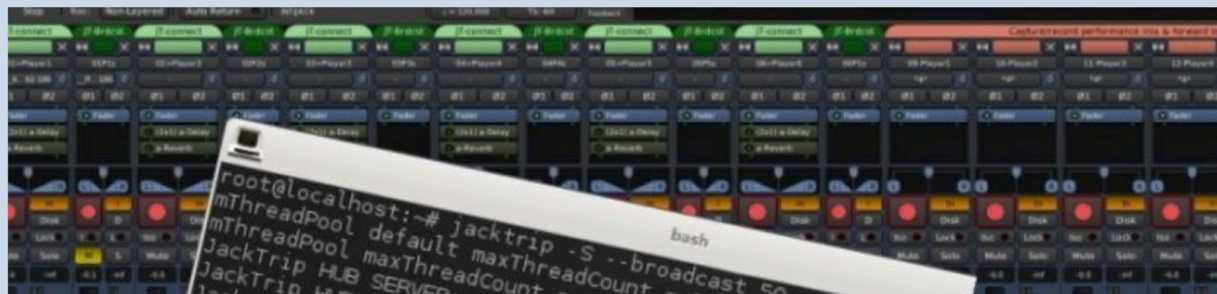
Server





Here's how to build one...

Pretty Good Jacktrip Toolkit



Build your own server — in four steps

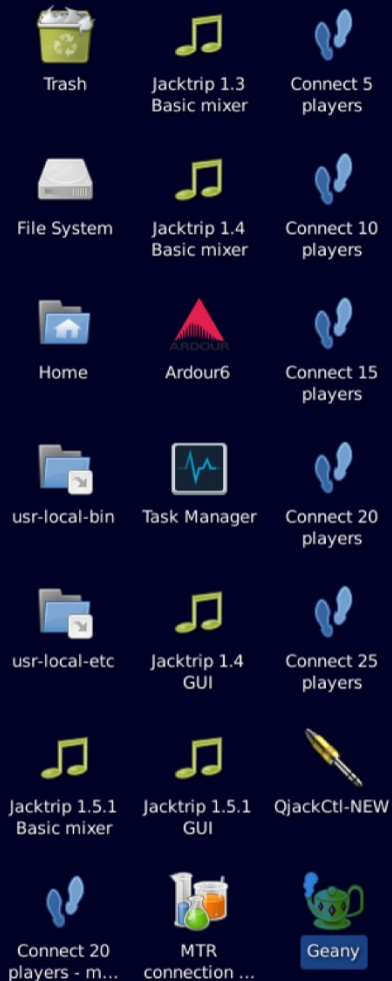
Step1: Provision a Linode server with [this Community StackScript](#)

Step2: SSH into the newly-provisioned server

Step3: Answer “yes” to the realtime audio prompt in the script

Step4: Log out and back in again when the script completes

Done – you can use the server through the command-line or a graphical interface (VNC)



Attributes that might appeal to producers...

Repeatable/Reliable/Stable

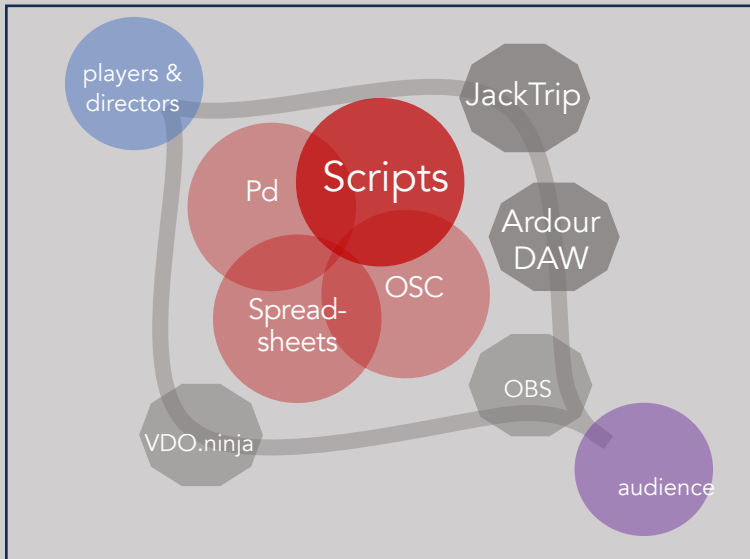
Flexible/Familiar/Feature-rich

Inexpensive/Open-source

Attributes that might appeal to players

Invisible/Transparent

Nuanced/Interactive



Puzzler: Hybrid performances and complex compositions needed reliable bi-directional multi channel audio connections.

tion can encounter when it evaluates a Player.

ction:

do nothing

determine receiving and sending connections to make

receiving stereo: assume we're also sending on 2 channels and:

- connect player - 2 in x 2 out
- add to current Mixer connections
- check for Multi JMess file for this Player in /usr/local/etc/ and run JMess against it if there is

receiving mono: determine how many channels we're sending

we're sending 2 channels

- connect player - 1 in x 2 out
- add to current Mixer connections
- check for Multi JMess file for this Player in /usr/local/etc/ and run JMess against it if there is

send_2 NOT connected?

- we're sending 1 channel

- connect player - 1 in x 1 out
- add to current Mixer connections
- check for Multi JMess file for this Player in /usr/local/etc/ and run JMess against it if there is

3 NOT in Jack? in Mixer? - remove from current Mixer connections

4 NOT in Jack? NOT in Mixer - do nothing

5 in Jack TWICE? in Mixer? - post duplicate-player alert,
- take the alert down when they disconnect

Multi Channel

Puzzlers...

It's hard to reliably host, and impossible to mix, a large ensemble in JackTrip

It's hard to bring people into the mixer and extra hard if they drop and need to reconnect.

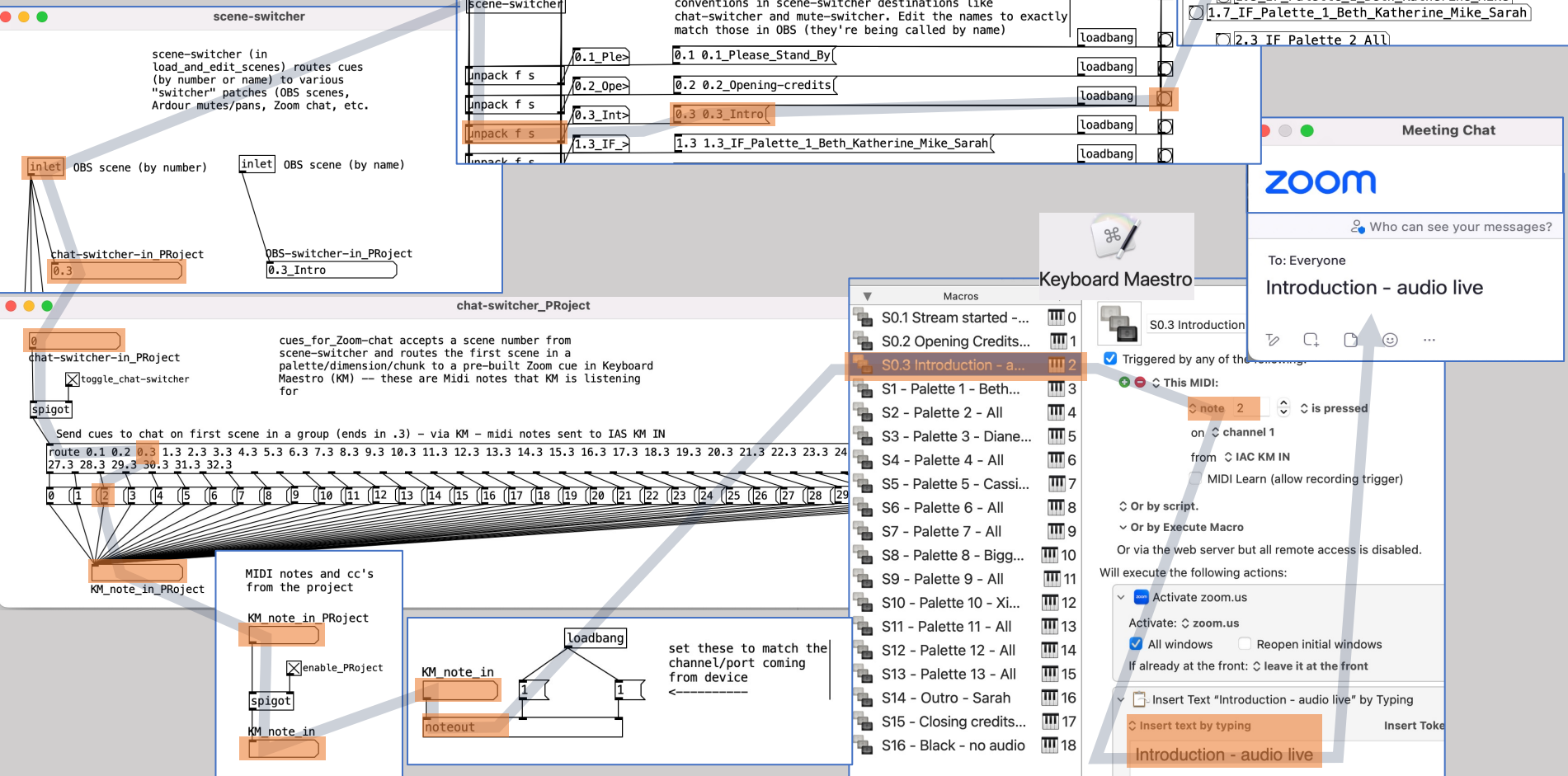
It's hard for one person to cue and mix video and audio for various scenes/cues/FX during a performance

Zoom video is... Zoom video. How can we get beyond that?

Hybrid performances and complex compositions need reliable bi-directional multi channel audio.

Performers need custom monitor mixes and are used to them in peer-to-peer apps like Sonobus (and recording studios).

Here's the path to cue a Zoom-chat scene-change



sources...

Software

DAW (midi)

Keystroke scripting (midi)

Shot-box scripting (midi, OSC)

Video editing (OSC)

Hardware

Audio interface (OSC)

Midi control-surface (midi)

structuring/translating/routing/filtering/timing

destinations...

DAW
(midi)

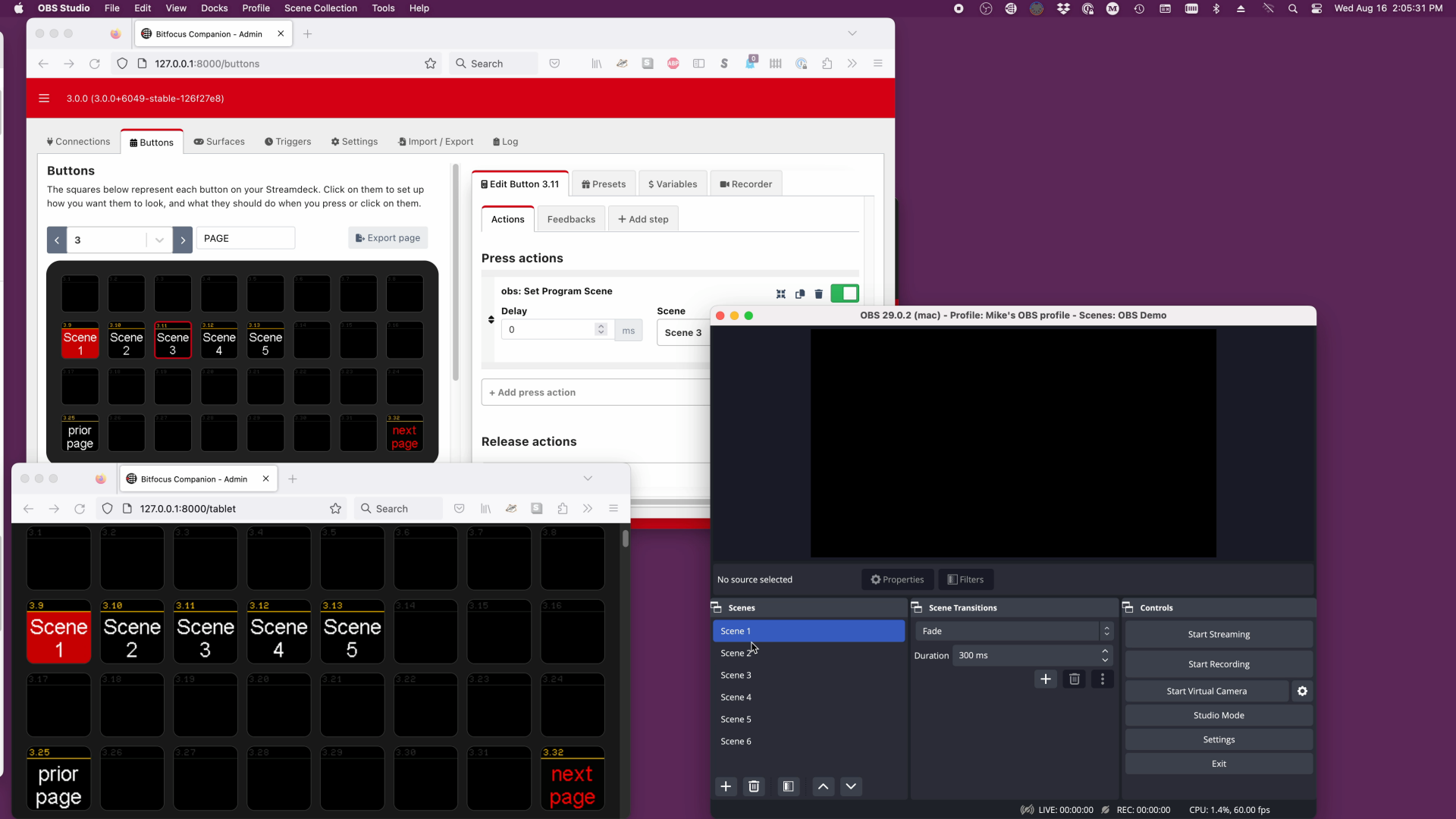
Keystroke scripting
(midi)

Audio interface
(OSC)

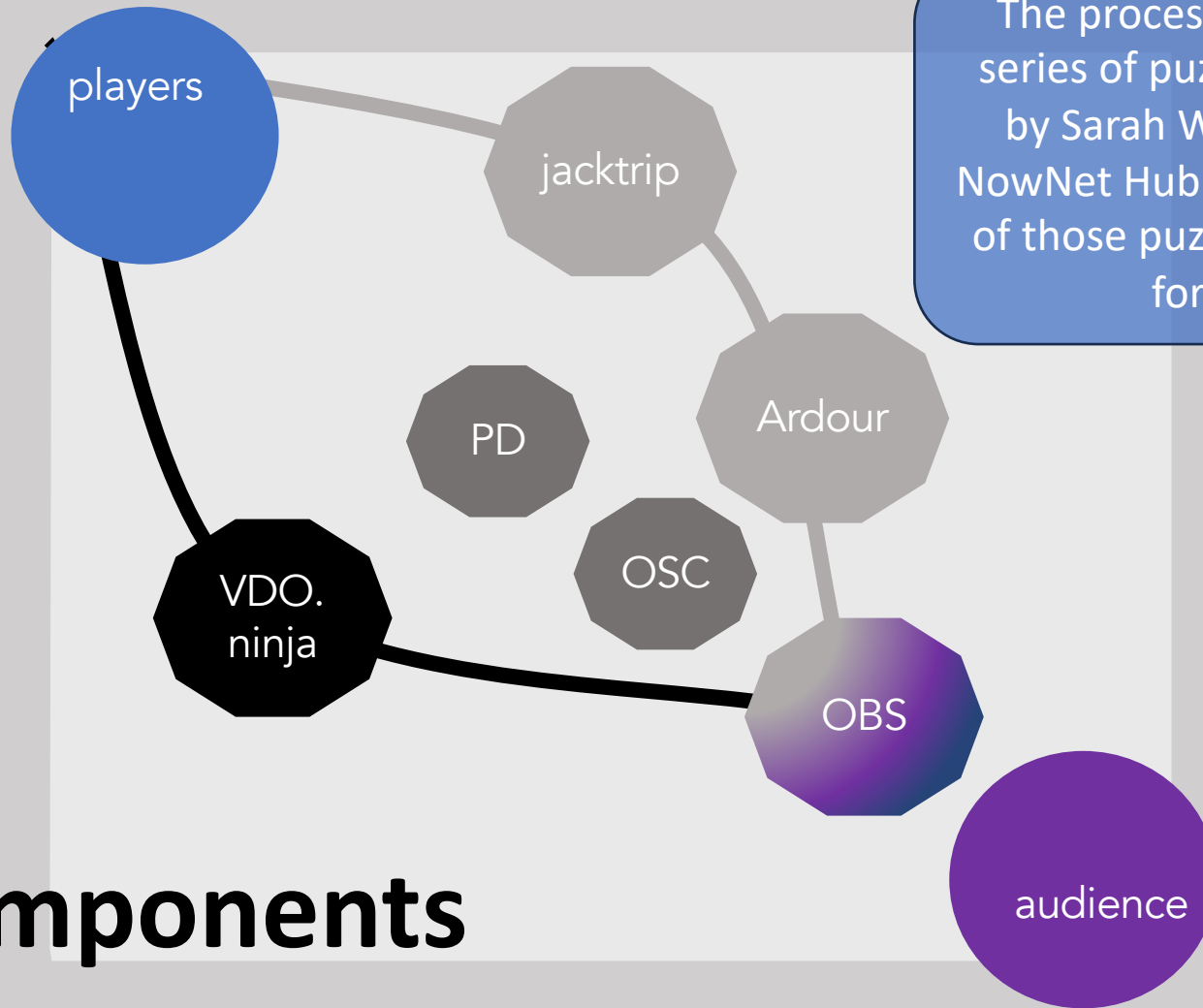
Shot-box scripting
(midi, OSC)

Midi control-surface
(midi)

Video editing
(OSC)



The process unfolded as a series of puzzlers presented by Sarah Weaver and the NowNet Hub. The chronology of those puzzlers is the story for today.



Components

Steps along the way

- Pretty Good JackTrip toolkit (PGJTT)
- Connect Players Script
- Gloria's cues
- VDO.ninja
- Custom cue-mixing
- Multi-channel audio

players &
directors

Pure
Data

Scripts

Google
sheet

Bitfocus

companion

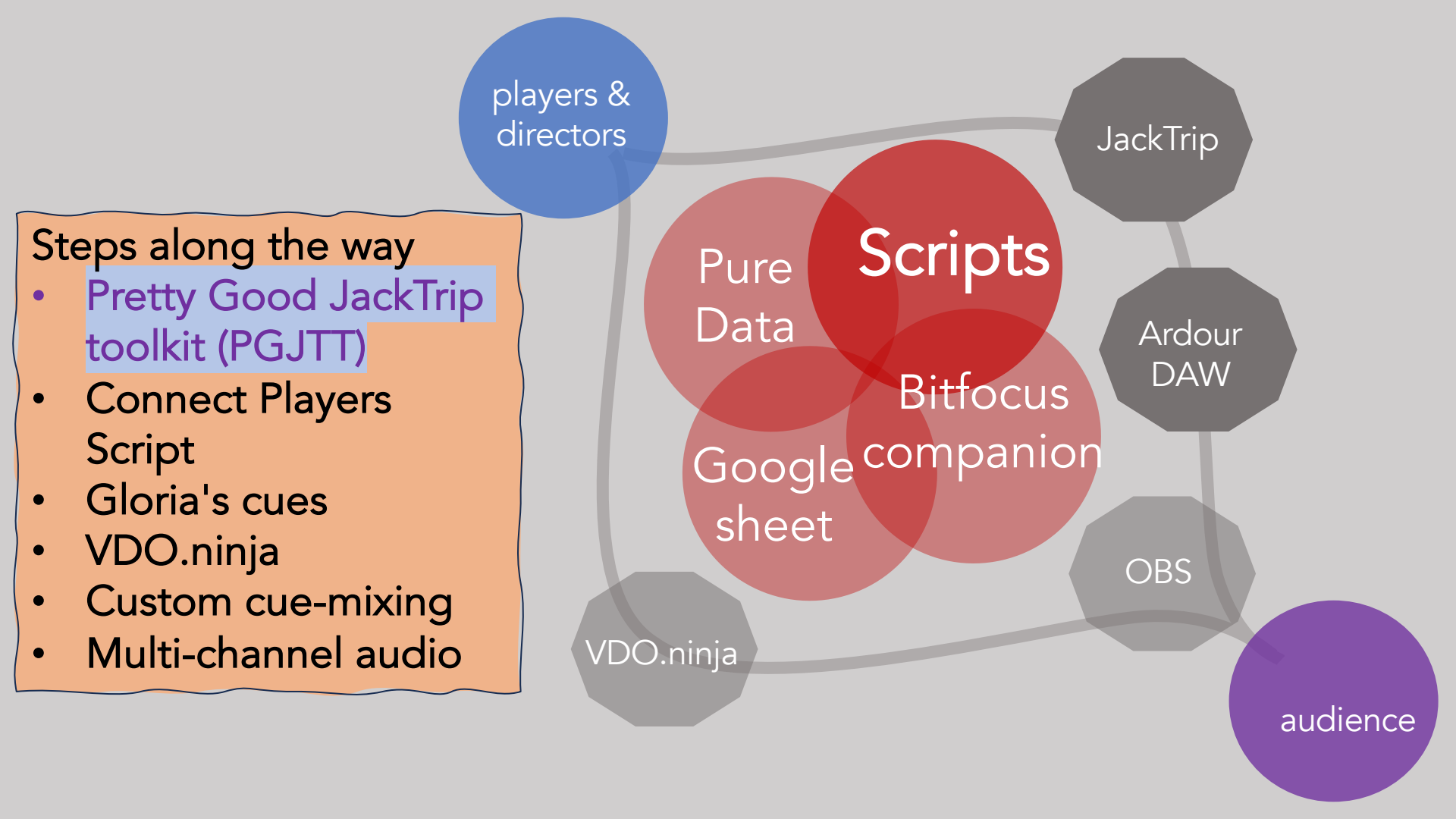
JackTrip

Ardour
DAW

OBS

VDO.ninja

audience



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- Gloria's cues
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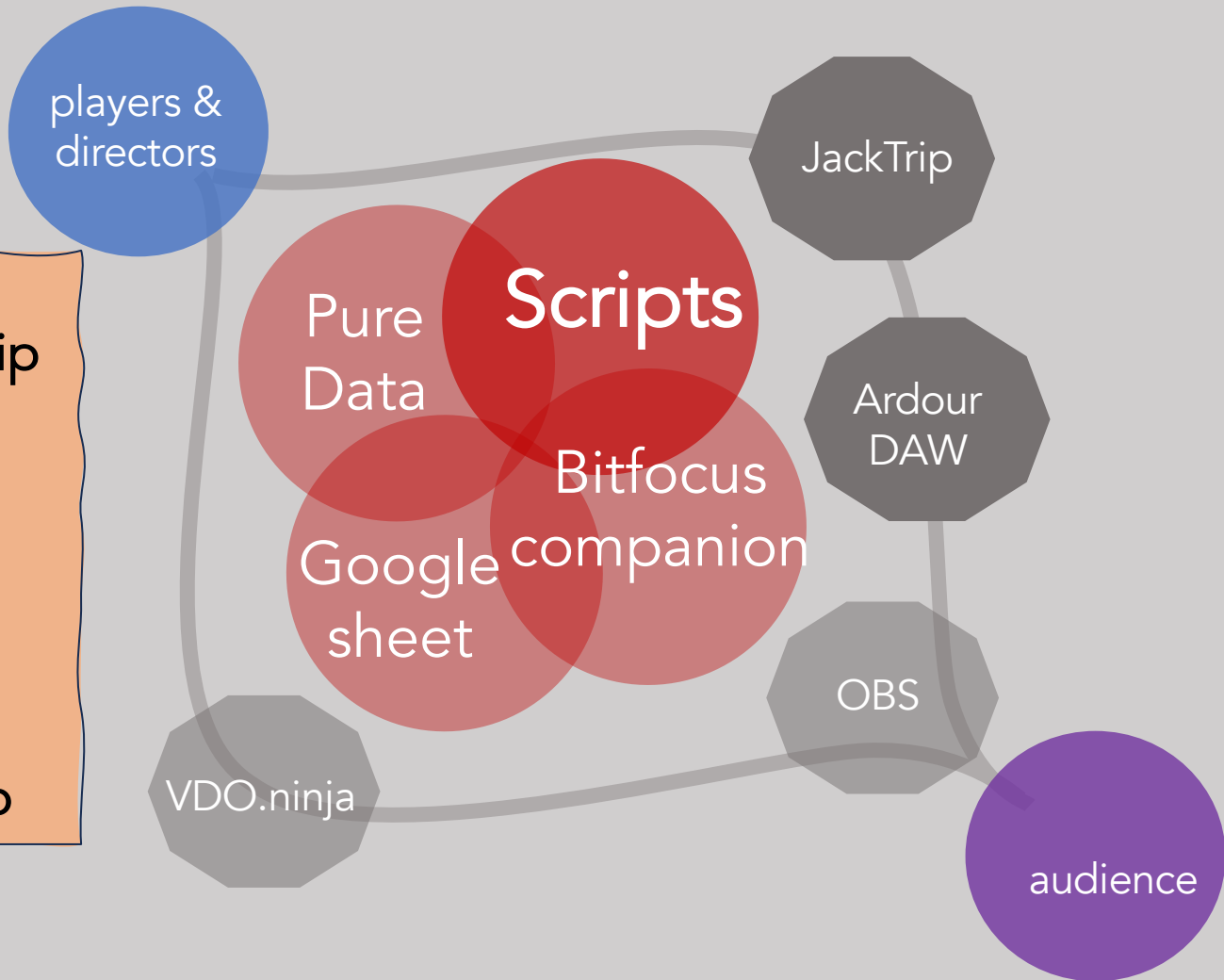
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Ardour
DAW

OBS

VDO.ninja

audience



Steps along the way

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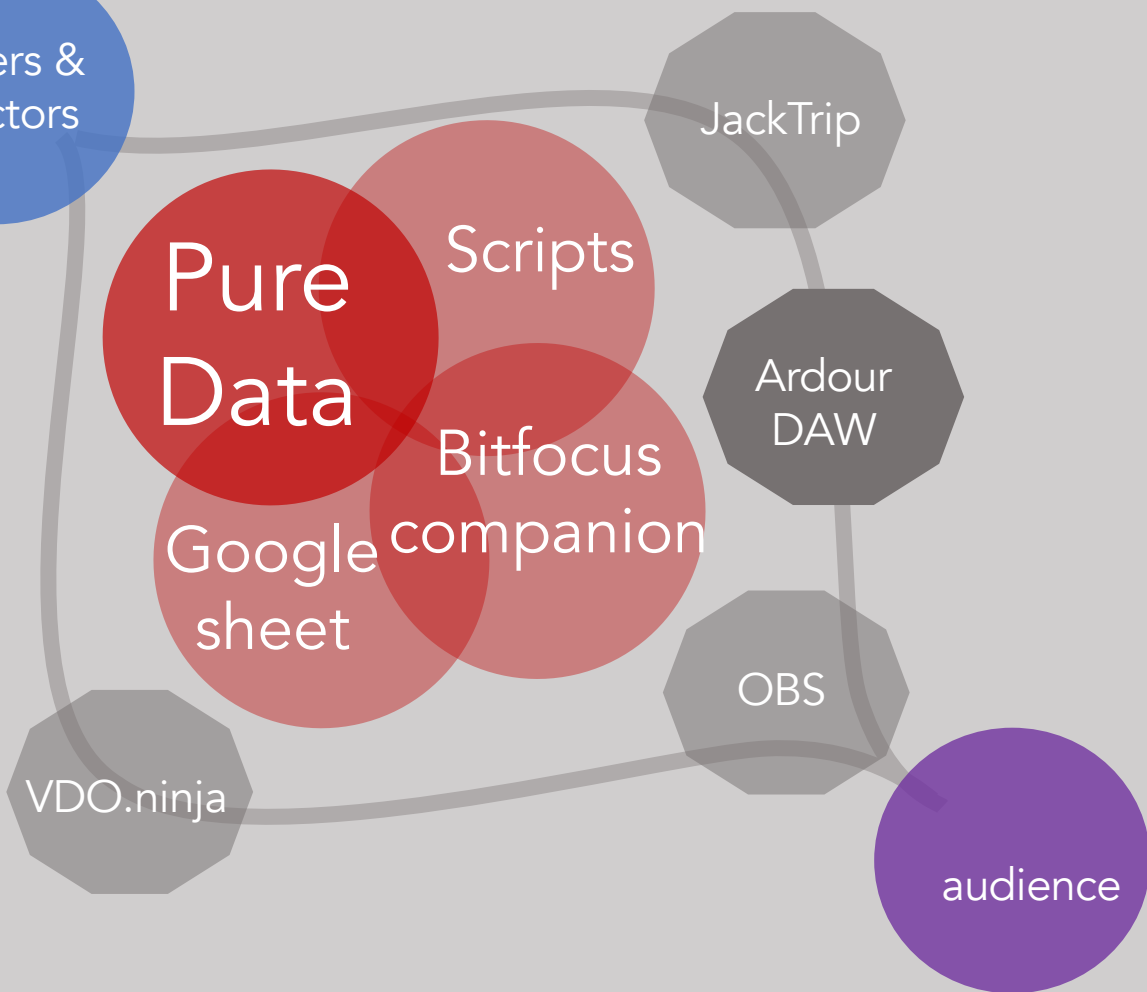
JackTrip

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DAW

OBS

VDO.ninja

audience



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- VDO.ninja
- Custom cue-mixing
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players &
directors

Pure
Data

Scripts

Google
sheet

Bitfocus

companion

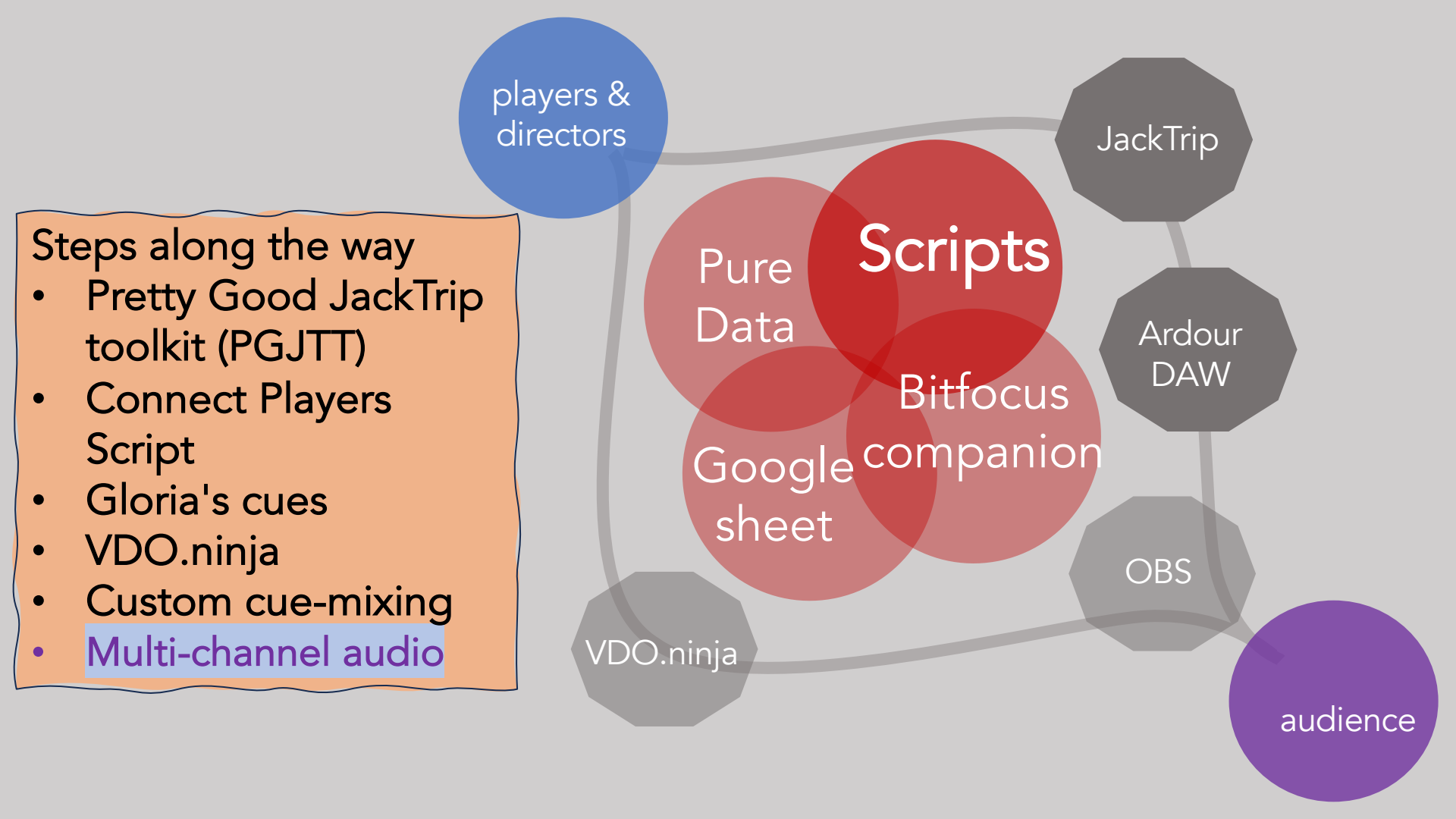
JackTrip

Ardour
DAW

OBS

VDO.ninja

audience



JackTrip receive

Arduour mixer

Multi-channel

Player
sending post-fader

Player1 1
2

-a Player1

-multi Player1

Player
sending pre-fader

Player2 1
2

-a Player2

-multi Player2

Player multi in,
sending pre-fader

Player3 1 (L)
2 (R)
3 (L)
4 (R)

-a Player3

-multi Player3

Player skipped,
occupied by Player 3

Player4 1
2

-a Player4

-multi Player4

Player not
sending
or receiving multi

Player5 1
2

-a Player5

-multi Player5

Player multi in,
sending post-fader

Player6 1 (L)
2 (R)
3 (L)
4 (R)

-a Player6

-multi Player6

Player skipped,
occupied by Player 6

Player7 1
2

-a Player7

-multi Player7

Player receiving

Player8 1
2

-a Player8

Mix minus
-multi Player8

Example file: **Player1, sending post-fader**

(Replace 'MultiExample' with a session name)

/usr/local/bin/MultiExample_JMess_Player1_multi.xml
|

```
<jmess>
```

```
<connection>
```

```
<output>ardour:-a Player1/audio_out 1</output>
```

```
<input>ardour:-multi Player1/audio_in 1</input>
```

```
</connection>
```

```
<connection>
```

```
<output>ardour:-a Player1/audio_out 2</output>
```

```
<input>ardour:-multi Player1/audio_in 2</input>
```

```
</connection>
```

```
</jmess>
```

test connections running JMess against the file name, eg:

jmess -c /usr/local/bin/MultiExample_JMess_Player1_multi.xml

- green box – player's JackTrip connection
(inbound and outbound)

- grey box – not in use

- purple box – Player mixing channels – Ardour

- red box – Player multi channels – Ardour

- blue solid line – connection made by the
connect_players script when the player
connects

- red dotted line – Player connection made by
the connect_players script if a JMess XML file
for the player exists in /usr/local/etc/ (it's
possible that players will send AND receive)

2 – Mix-minus (R)
3 – Player1 (L)
4 – Player1 (R)
5 – Player2 (L)
6 – Player2 (R)
7 – Player3 (L)
8 – Player3 (R)
9 – Player4 (L)
10 – Player4 (R)
11 – Player5 (L)
12 – Player5 (R)
13 – Player6 (L)
14 – Player6 (R)
Player8

JackTrip receive

Ardoour mixer

Multi-channel

Example file: **Player2, sending pre-fader**

(Replace 'MultiExample' with a session name)

/usr/local/bin/MultiExample_JMess_Player2_multi.xml
|

```
<jmess>
```

```
<connection>
```

```
<output>Player2:receive_1</output>
```

```
<input>ardour:-multi Player2/audio_in 1</input>
```

```
</connection>
```

```
<connection>
```

```
<output>Player2:receive_2</output>
```

```
<input>ardour:-multi Player2/audio_in 2</input>
```

```
</connection>
```

```
</jmess>
```

test connections running JMess against the file name, eg:

`jmess -c /usr/local/bin/MultiExample_JMess_Player2_multi.xml`

Player
sending post-fader

Player1
1
2

-a Player1

-multi Player1

Player
sending pre-fader

Player2
1
2

-a Player2

-multi Player2

Player multi in,
sending pre-fader

Player3
1 (L)
2 (R)
3 (L)
4 (R)

-a Player3

-multi Player3

Player skipped,
occupied by Player 3

Player4
1
2

-a Player4

-multi Player4

Player not
sending
or receiving multi

Player5
1
2

-a Player5

-multi Player5

Player multi in,
sending post-fader

Player6
1 (L)
2 (R)
3 (L)
4 (R)

-a Player6

-multi Player6

Player skipped,
occupied by Player 6

Player7
1
2

-a Player7

-multi Player7

Player receiving

Player8
1
2

-a Player8

-multi Player8

- green box – player's JackTrip connection
(inbound and outbound)

- grey box – not in use

- purple box – Player mixing channels – Ardour

- red box – Player multi channels – Ardour

- blue solid line – connection made by the
connect_players script when the player
connects

- red dotted line – Player connection made by
the connect_players script if a JMess XML file
for the player exists in /usr/local/etc/ (it's
possible that players will send AND receive)

1 – Mix-minus (L)
2 – Mix-minus (R)
3 – Player1 (L)
4 – Player1 (R)
5 – Player2 (L)
6 – Player2 (R)
7 – Player3 (L)
8 – Player3 (R)
9 – Player4 (L)
10 – Player4 (R)
11 – Player5 (L)
12 – Player5 (R)
13 – Player6 (L)
14 – Player6 (R)
Player8

JackTrip receive

Ardoeur mixer

Multi-channel

Player
sending post-fader

Player1 1
2

-a Player1

-multi Player1

Player
sending pre-fader

Player2 1
2

-a Player2

-multi Player2

Player multi in,
sending pre-fader

Player3 1 (L)
2 (R)
3 (L)
4 (R)

-a Player3

-multi Player3

Player skipped,
occupied by Player 3

Player4 1
2

-a Player4

-multi Player4

Player not
sending
or receiving multi

Player5 1
2

-a Player5

-multi Player5

Player multi in,
sending post-fader

Player6 1 (L)
2 (R)
3 (L)
4 (R)

-a Player6

-multi Player6

Player skipped,
occupied by Player 6

Player7 1
2

-a Player7

-multi Player7

Player receiving

Player8 1
2

-a Player8

Mix minus
-multi Player8

- green box – player's JackTrip connection
(inbound and outbound)

- grey box – not in use

- purple box – Player mixing channels – Ardoeur

- red box – Player multi channels – Ardoeur

- blue solid line – connection made by the
connect_players script when the player
connects

- red dotted line – Player connection made by
the connect_players script if a JMess XML file
for the player exists in /usr/local/etc/ (it's
possible that players will send AND receive)

Example file: **Player3, sending 4-chan multi-in pre-fader**

(Replace 'MultiExample' with a session name)

/usr/local/bin/MultiExample_JMess_Player2_multi.xml

```
<connection>
  <output>Player3:receive_1</output>
  <input>ardour:-multi Player3/audio_in 1</input>
</connection>
<connection>
  <output>Player3:receive_2</output>
  <input>ardour:-multi Player3/audio_in 2</input>
</connection>
```

```
<connection>
  <output>Player3:receive_3</output>
  <input>ardour:-a Player4/audio_in 1</input>
</connection>
<connection>
  <output>Player3:receive_4</output>
  <input>ardour:-a Player4/audio_in 2</input>
</connection>
```

```
<connection>
  <output>Player3:receive_3</output>
  <input>ardour:-multi Player4/audio_in 1</input>
</connection>
<connection>
  <output>Player3:receive_4</output>
  <input>ardour:-multi Player4/audio_in 2</input>
</connection>
```

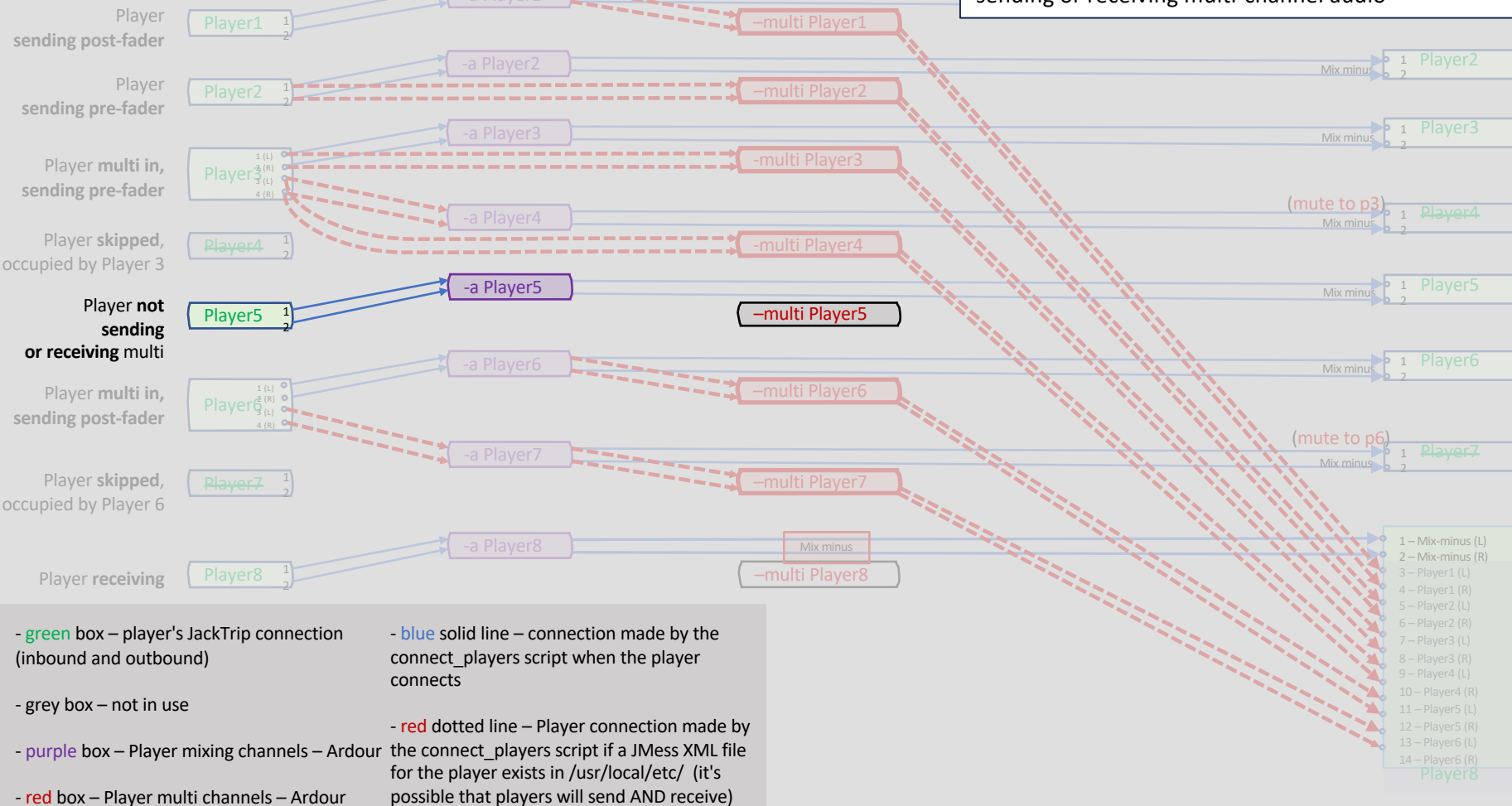
test connections running JMess against the file name, eg:

JackTrip receive

Ardoour mixer

Multi-channel

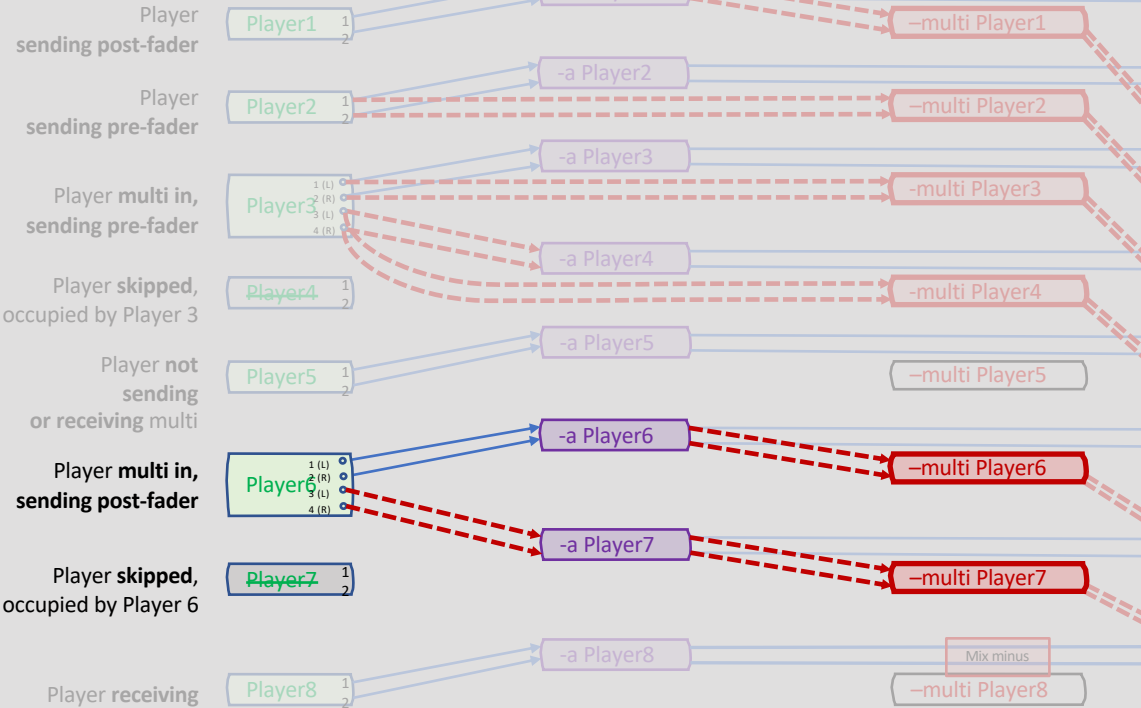
This player has no JMess file because they're not sending or receiving multi-channel audio



JackTrip receive

Arduour mixer

Multi-channel



- green box – player's JackTrip connection (inbound and outbound)

- grey box – not in use

- purple box – Player mixing channels – Arduour

- red box – Player multi channels – Arduour

- blue solid line – connection made by the connect_players script when the player connects

- red dotted line – Player connection made by the connect_players script if a JMess XML file for the player exists in /usr/local/etc/ (it's possible that players will send AND receive)

Example file: **Player6, sending 4-chan multi-in post-fader**
(Replace 'MultiExample' with a session name)
/usr/local/bin/MultiExample_JMess_Player2_multi.xml

```
<connection>
  <output> arduour:-a Player6/audio_out 1</output>
  <input>ardour:-multi Player6/audio_in 1</input>
</connection>
<connection>
  <output> arduour:-a Player6/audio_out 1</output>
  <input>ardour:-multi Player6/audio_in 2</input>
</connection>
<connection>
  <output>Player6:receive_3</output>
  <input>ardour:-a Player7/audio_in 1</input>
</connection>
<connection>
  <output>Player6:receive_4</output>
  <input>ardour:-a Player7/audio_in 2</input>
</connection>
```

```
<connection>
  <output>ardour:-a Player7/audio_out 1</output>
  <input>ardour:-multi Player7/audio_in 1</input>
</connection>
<connection>
  <output>ardour:-a Player7/audio_out 1</output>
  <input>ardour:-multi Player7/audio_in 2</input>
</connection>
```

test connections running JMess against the file name, eg:
jmess -c /usr/local/bin/MultiExample_JMess_Player6_multi.xml

Example file: **Player8, receiving 12-chan multi-in**
 (Replace 'MultiExample' with a session name)
/usr/local/bin/MultiExample_JMess_Player8_multi.xml

Multi-channel

Multichannel examples
 mike@haven2.com

JackTrip send

