

The logo for 'phrame' is displayed in a white, lowercase, sans-serif font. It is enclosed within a stylized orange frame that consists of a horizontal bar at the top and bottom, and vertical bars on the left and right sides, with the corners cut off at 45-degree angles.

phrame

IET - Anglian Coastal Network

Live Video Production The Journey to the Cloud

Thursday 13th March 2025 7:00pm

A smaller version of the 'phrame' logo, featuring the word 'phrame' in white lowercase letters inside an orange frame with cut-off corners.

phrame

Who?



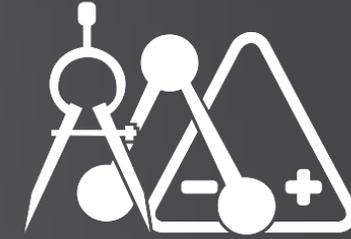
David Atkins
Founder and Developer



Former Hovercraft race driver!

Designer of systems for MAM systems and live production with Suitcase TV
Bitmap Subtitling with Screen Subtitling Systems

Designer of Telco test infrastructure for Wi-Fi, broadband, Digital Voice and more



3 A Design



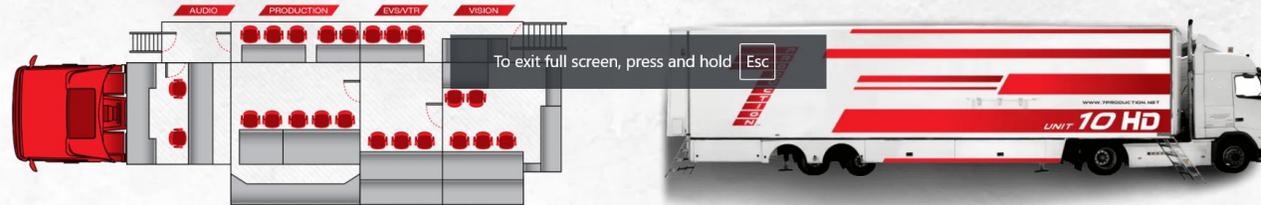
Suitcase TV



Live Production is Expensive!



Expensive Proprietary Equipment



[VIEW MORE DETAILS](#)

VIDEO EQUIPMENT

CAMERA SYSTEM
 SUPER SLOMO CAMERA SYSTEM
 ULTRA SLOMO CAMERA SYSTEM
 WIRELESS CAMERA SYSTEM
 CAMERA CONNECTION
 CAMERA LENSES
 TRIPODS

CONTROL ROOM
 HD VISION MIXER

CHARACTER GENERATOR
 PRODUCTION ROOM MONITORS
 SHADING ROOM MONITORS
 MULTIVIEWER SYSTEM
 HD VTRS
 TAPELESS RECORDERS
 REPLAY SYSTEM
 GLUE
 VIDEO MATRIX
 OB CONTROL
 WAVEFORM

Sony HDC1700/R (18+)
 Sony HDC-3300R (2)
 Ikegami NAC HI-MOTION II
 ○ Vislink L1500 (6) ○ DOMO BTX (4)
 Fiber Optic Lemo SMPTE
CANON
 ○ CARTONI ○ VINTEN ○ SACHTLER
 ○ CAM-GEAR
Dual Production
 ○ GVG kayak HD 3.5ME
 ○ 72 inputs - 36 outputs
 ○ VizRT ○ Title box
SONY 50inch (6)
 ○ Sony 17inch (4) ○ Blackmagic (24)
 Evertz
 Sony HDW M2000P (6)
 HyperDeck Studio Pro (10)
EVS XT2
AXON
 ○ GV TRINIX ○ 256 input – 224 output
TSL
 Tektronix WFM 5000

AUDIO EQUIPMENT

AUDIO MIXING CONSOLE

MICROPHONES
 MULTITRACK RECORDING
 AUDIO EFFECTS

AUDIO MEASUREMENT

INTERCOM EQUIPMENT

INTERCOM SYSTEM

WIRELESS TALK-BACK INTERCOM SYSTEM

HYBRID SYSTEM

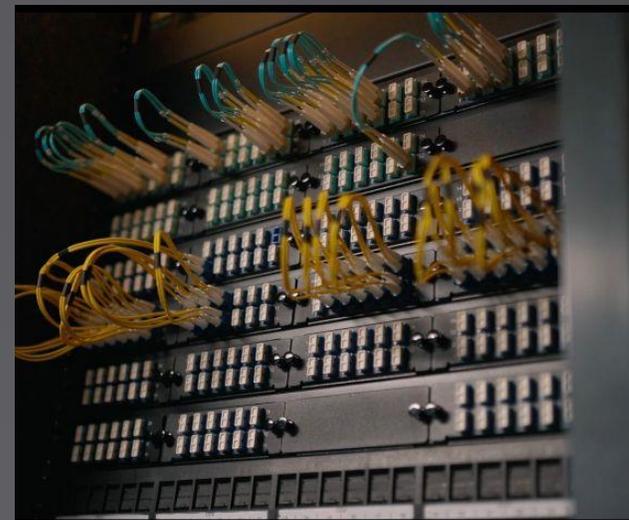
COACH BUILD

LENGTH 13.62 Meters
 WIDTH STOWED 2.59 Meters
 WIDTH EXPANDED 4.79 Meters
 HEIGHT 3.95 Meters
 WEIGHT 20t

○ Lawo MC2 66
 ○ Inputs local Ana:56 Dig:32 - Outputs:
 Ana:40 Dig:32
Sennheiser
AVID Pro Tools
 ○ Yamaha SPX 900
 ○ 360 SYSTEMS INSTANT REPLAY 2
 ○ Decibel ○ VU meter

○ Clear-Com Matrix III
 ○ 28-4wire 4-2wire
 ○ 19 panels in ob - 3 external panels
 ○ Clear-Com HME
 ○ Riedel Riface with MOTOROLA Base Station and Motorola Radios
 ○ Kenwood Base Station with Motorola Radios
 ○ Glensound GSM Hybrid
 ○ Glensound Analog Landline Hybrid
 ○ Glensound Digital ISDN Hybrid

Expensive Proprietary Equipment



Cramped Inaccessible Environments



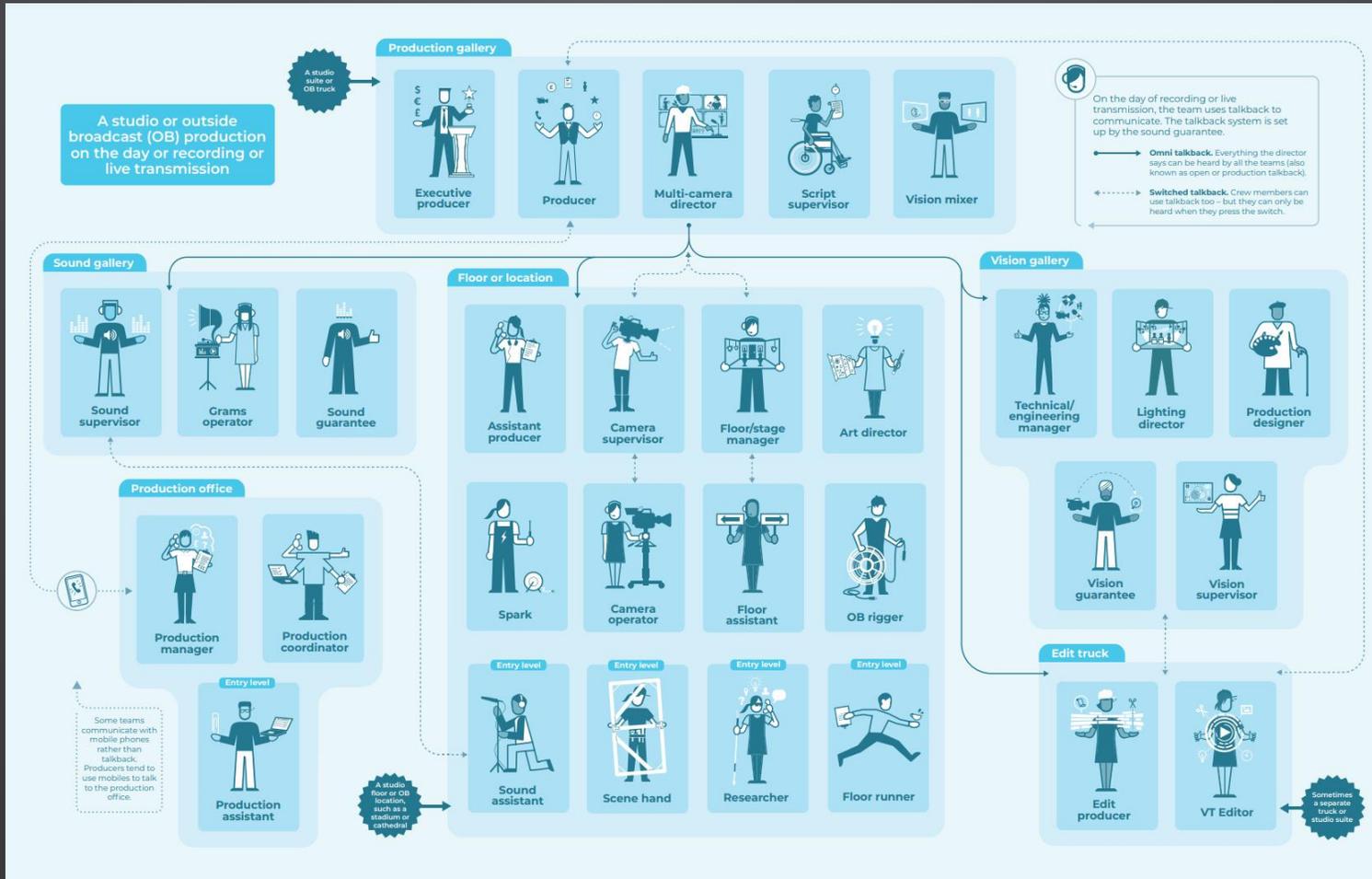
Inefficient Resource Usage

- ❑ Equipment only used when on site
- ❑ Operational staff have to travel to work
- ❑ Environments have poor access
- ❑ Hard to reconfigure

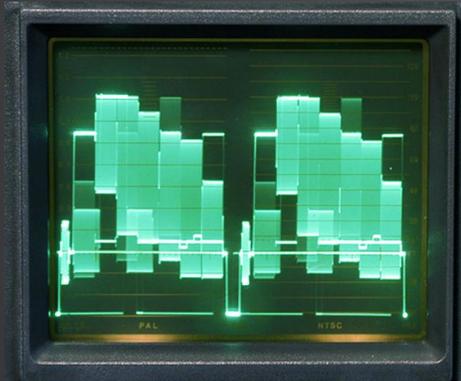
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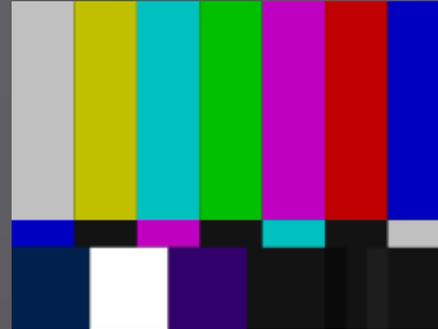
Complex Operation – Personnel



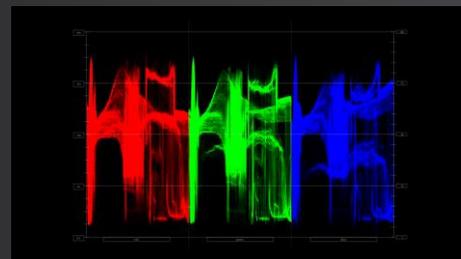
Signals and Data Rates



Analog
PAL / NTSC
Coax 75 Ohm



SDI / HD-SDI
270Mbit
1.5/3Gbit
12Gbit
Coax 75 Ohm

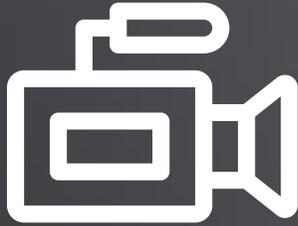


SMPTE 2110
1.5/3Gbit
12Gbit
UDP over IP

New tools are needed!
For IP and Cloud
working



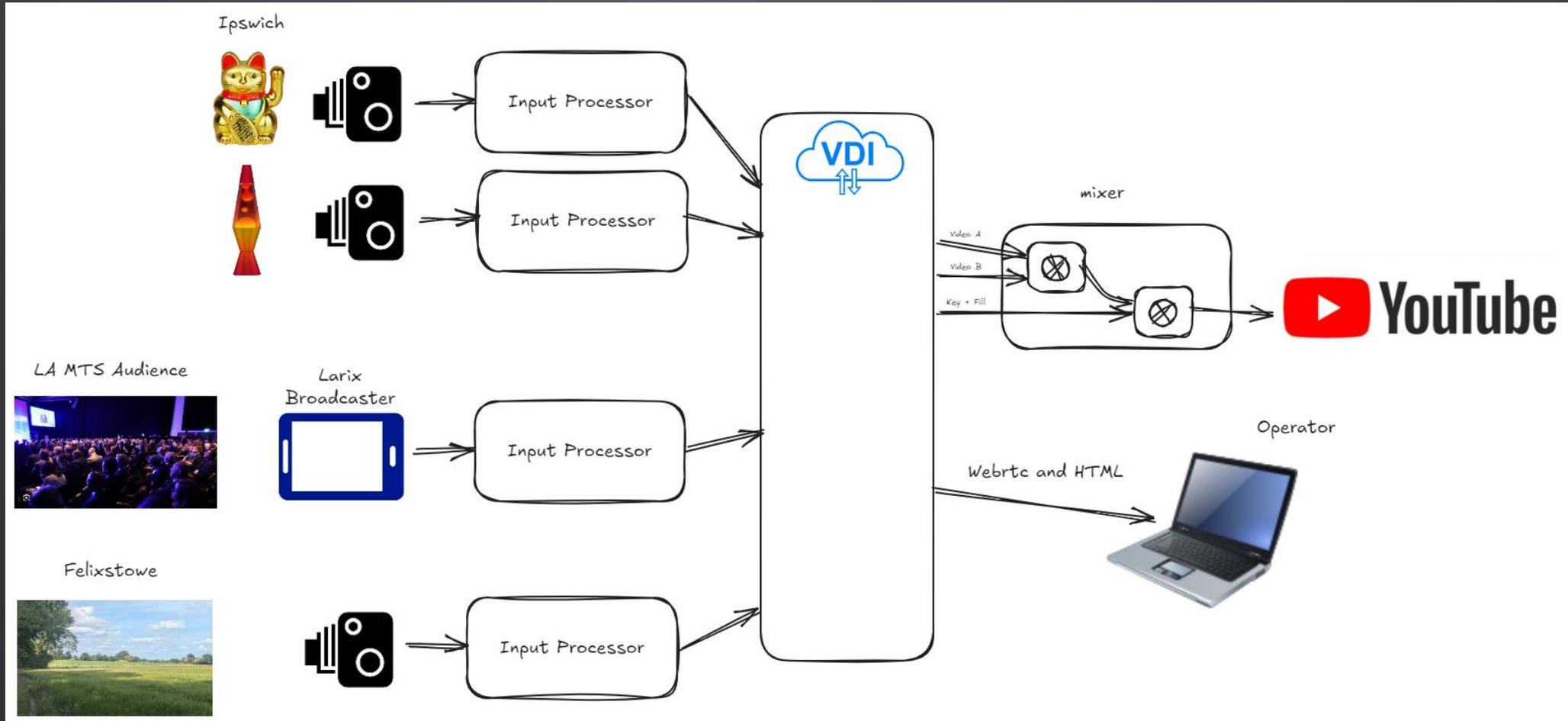
Cloud and Web – A Modern Approach



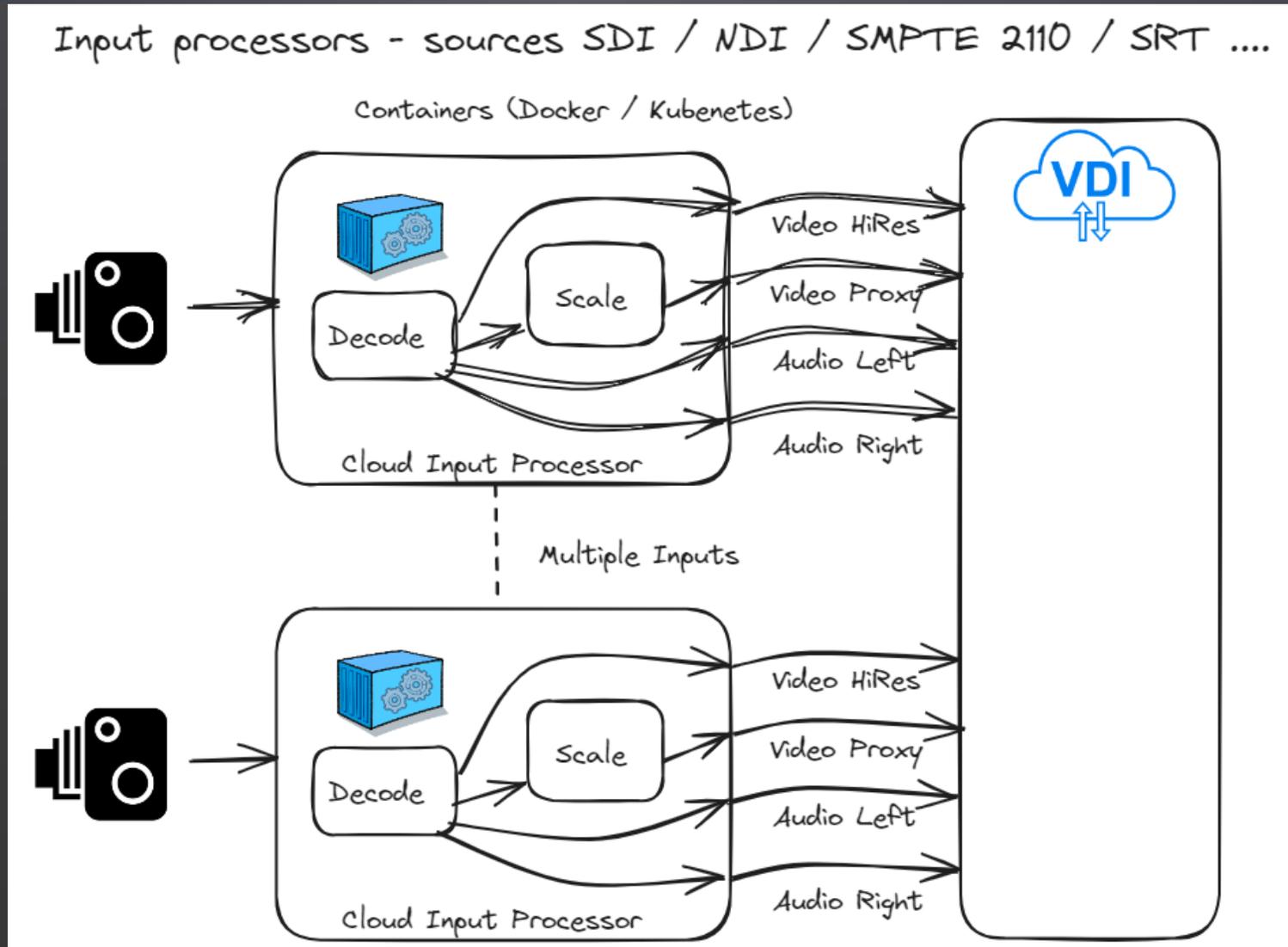
AWS,
GCS,
Digital Ocean,
Azure

- On Prem

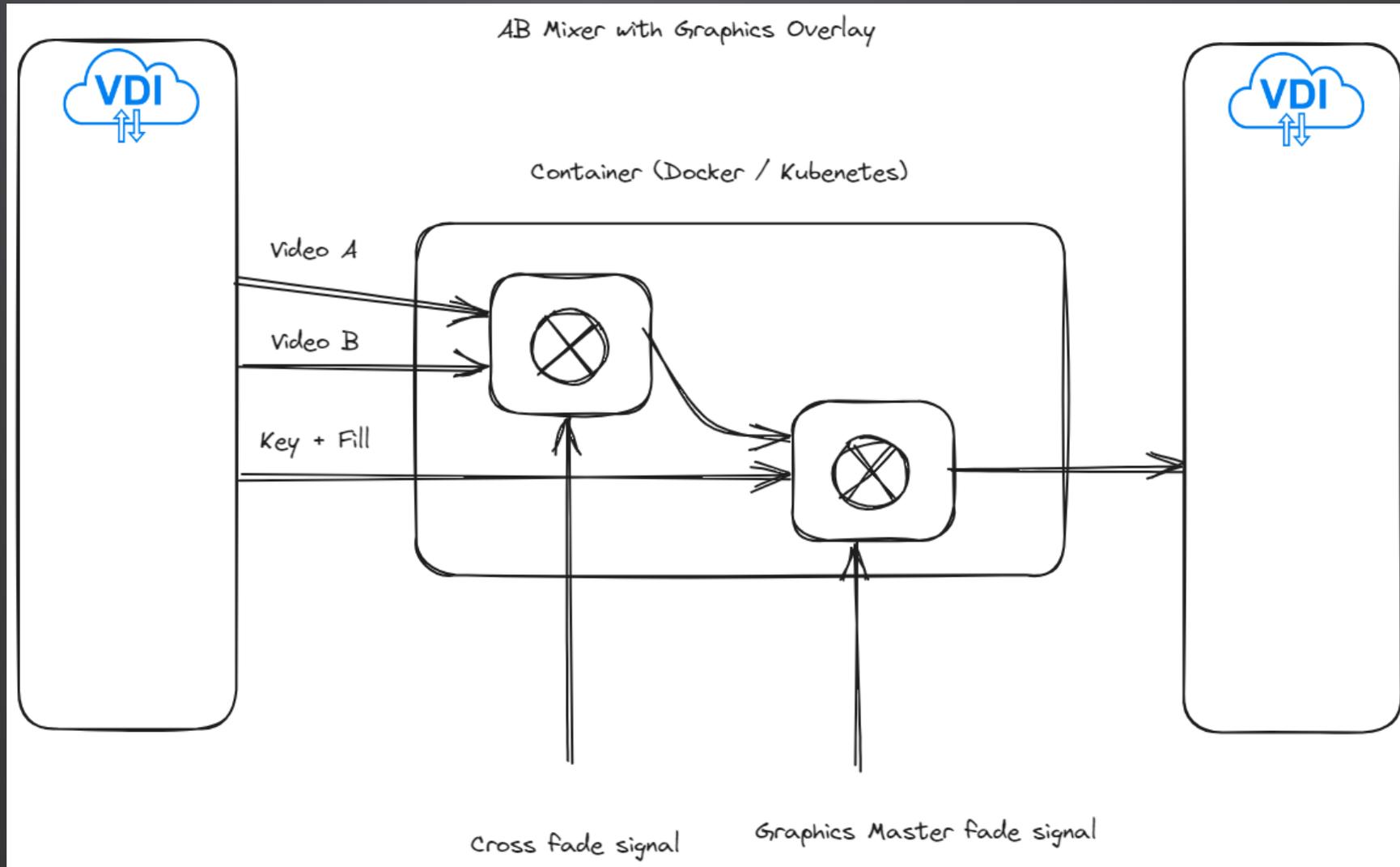
Example system - SMPTE MTS 2024 Demo setup



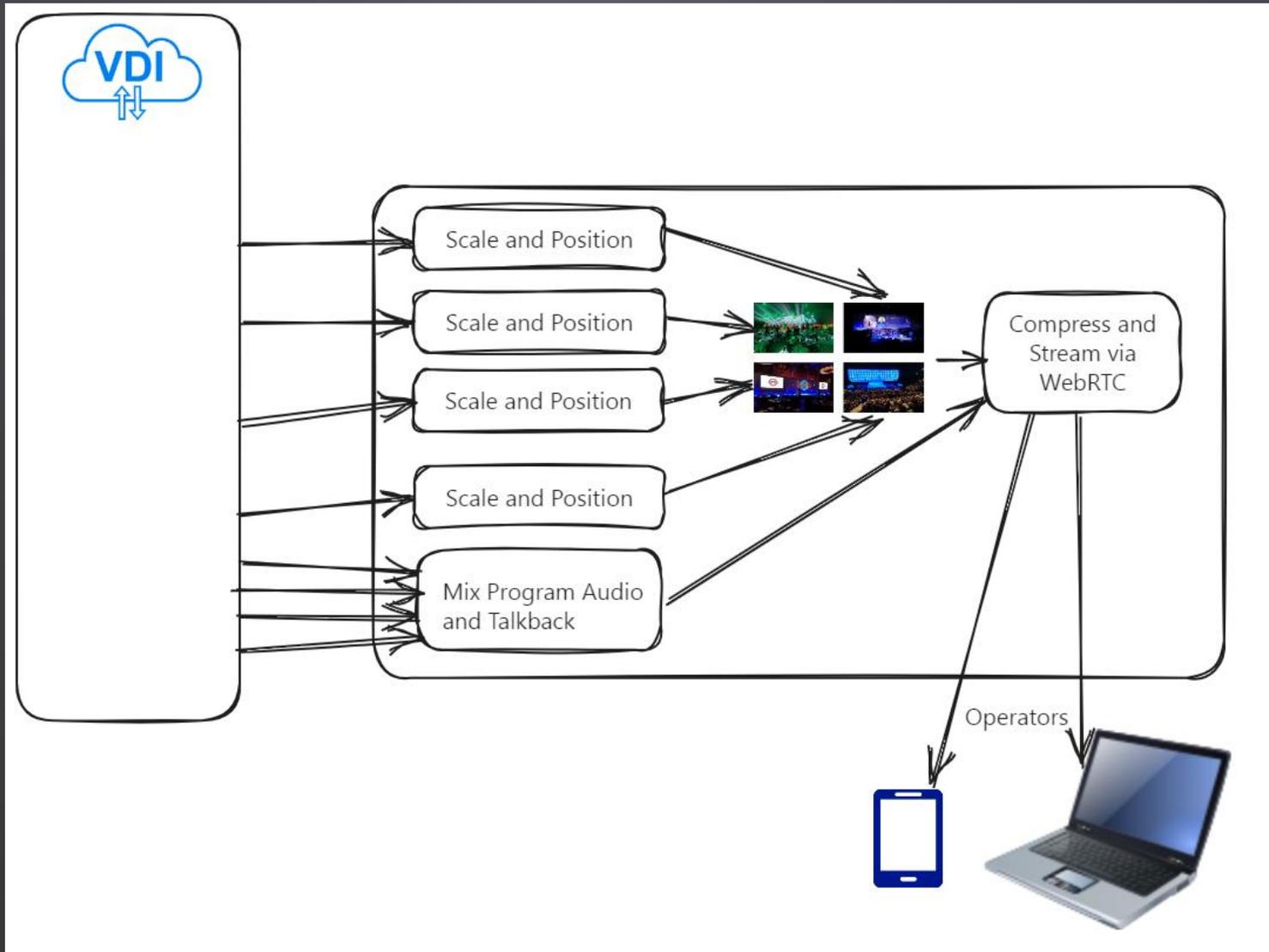
Input Processing



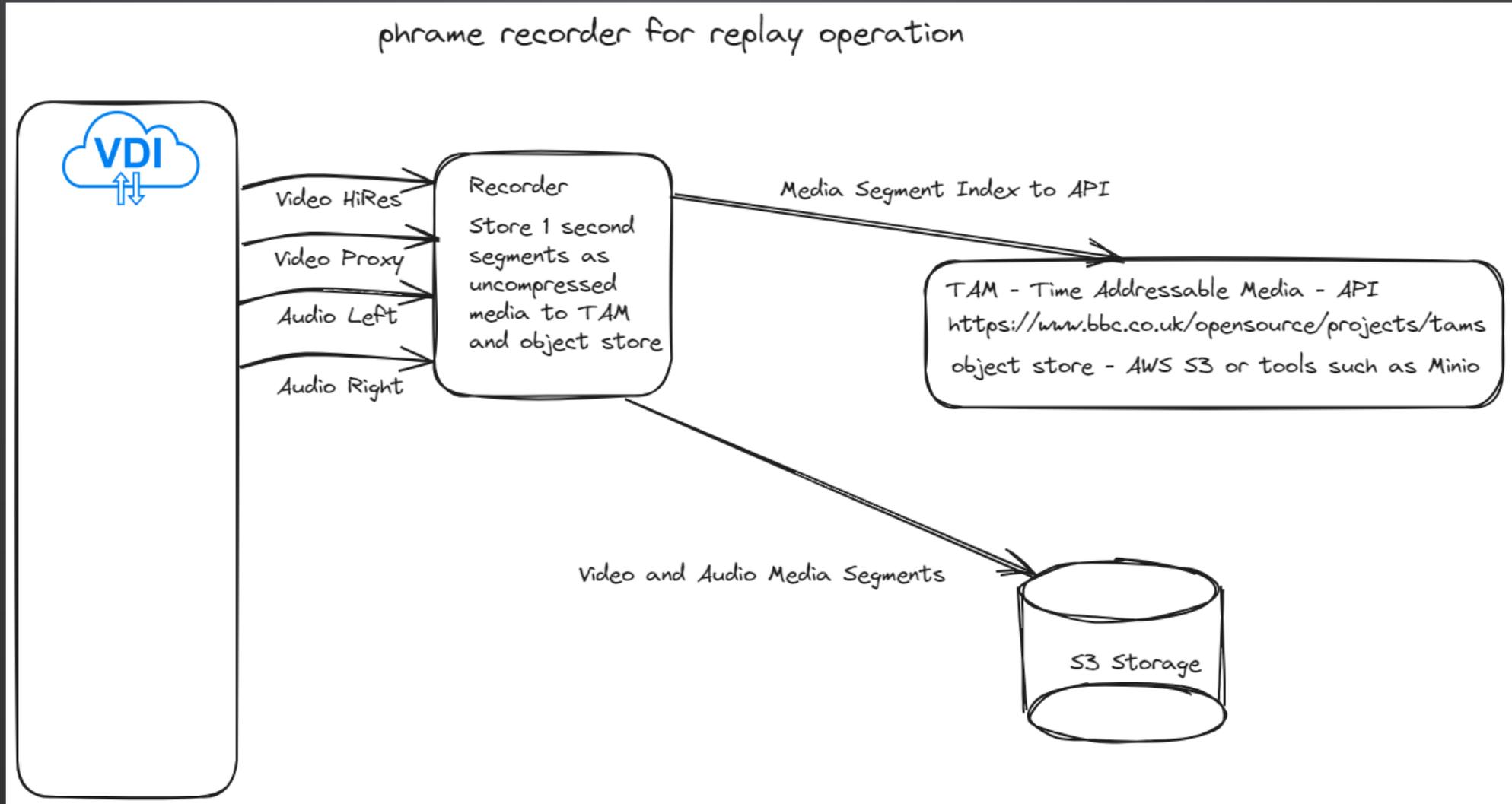
Overlay and Mixing



Operator Video Streaming

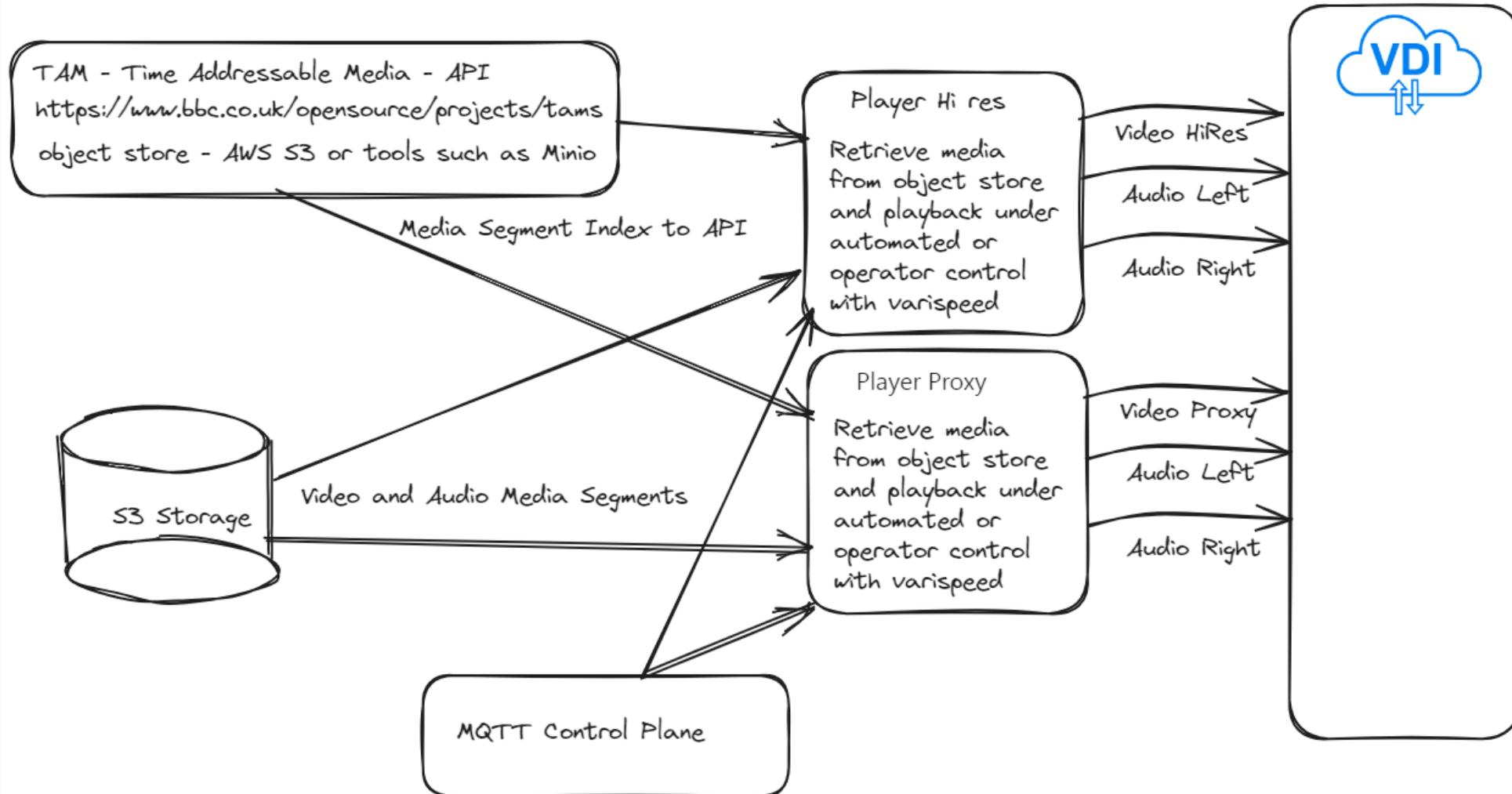


Replay Record with TAMS

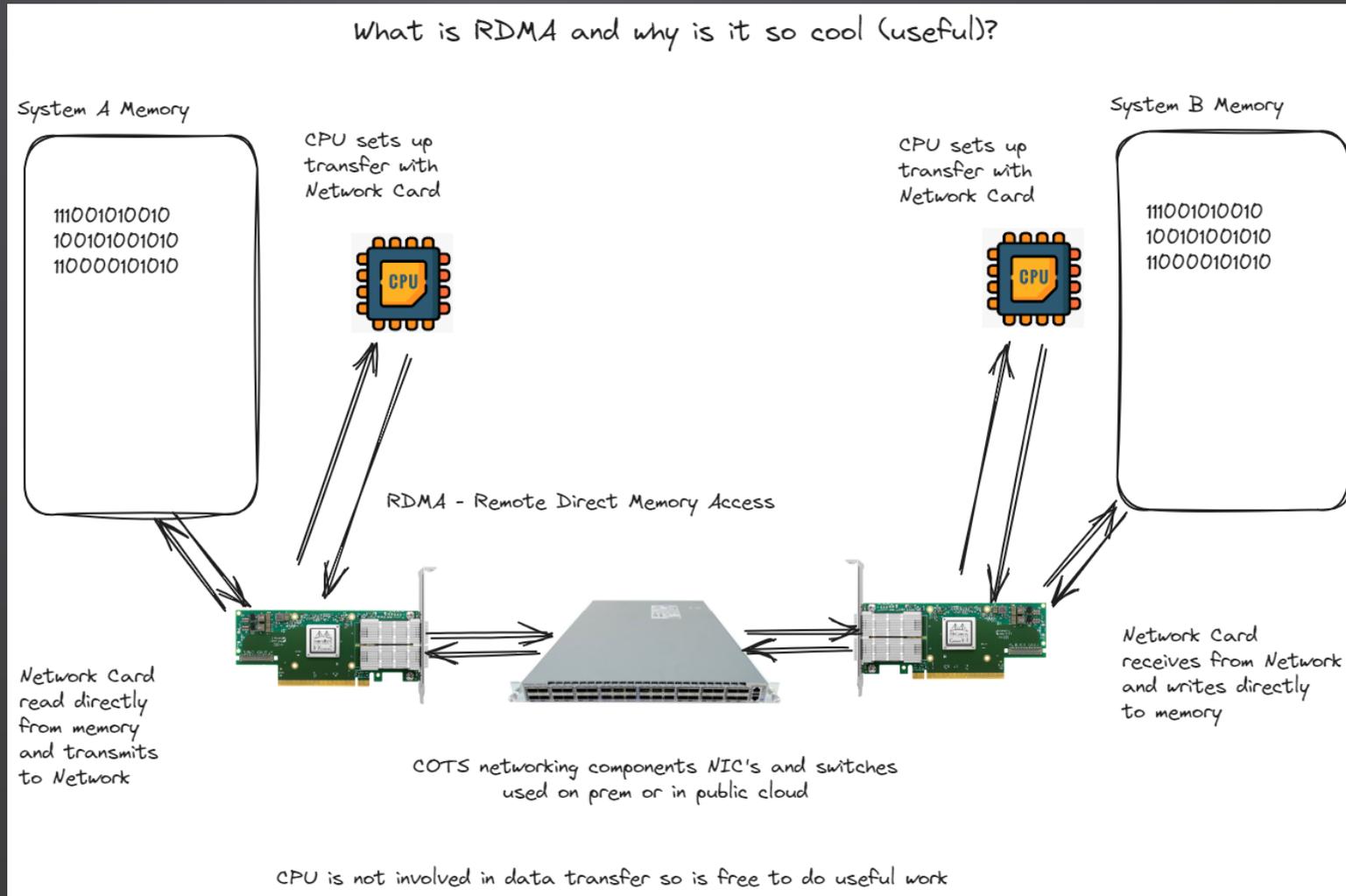


Replay Playback with TAMS

phrame playback for replay operation

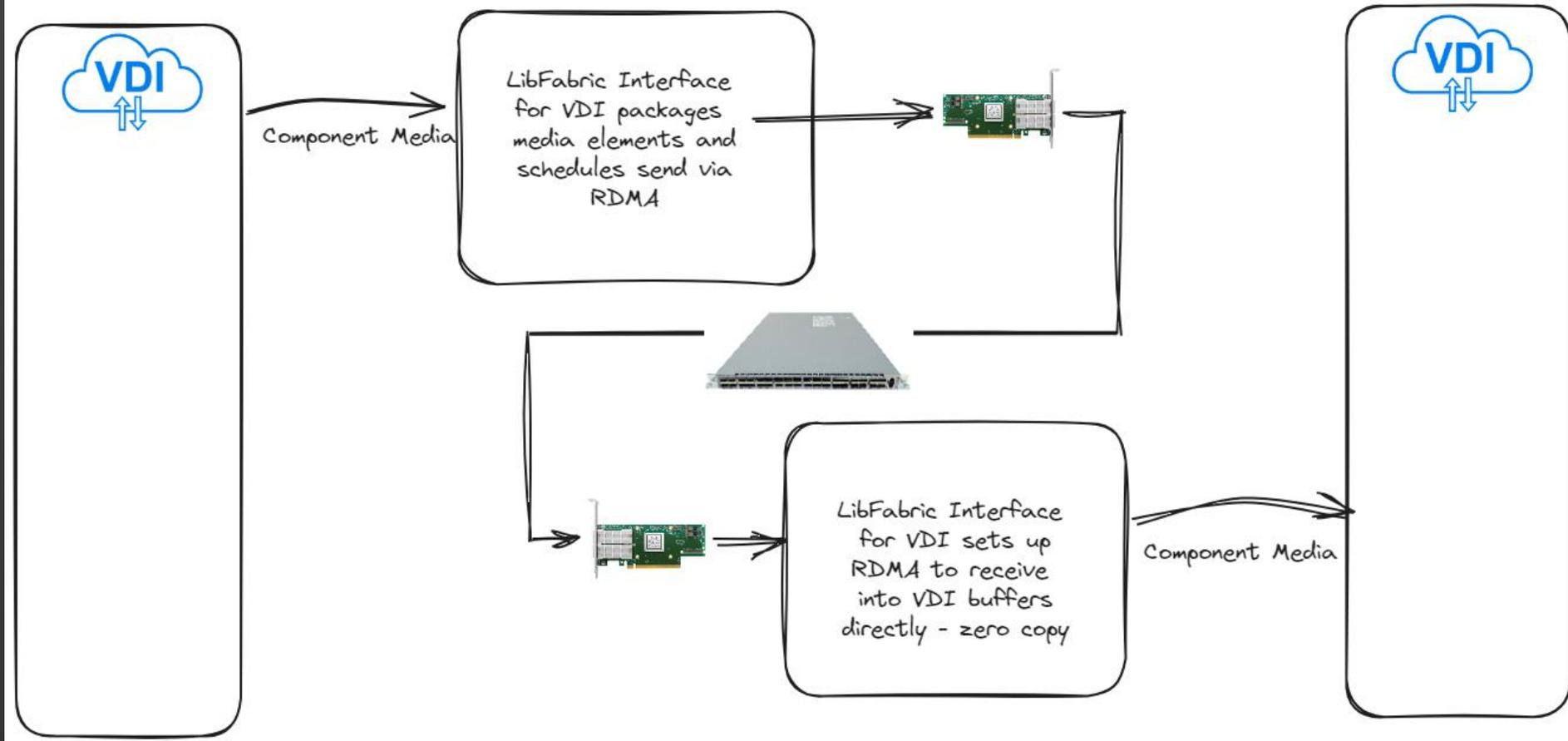


VDI, RDMA and GCCG



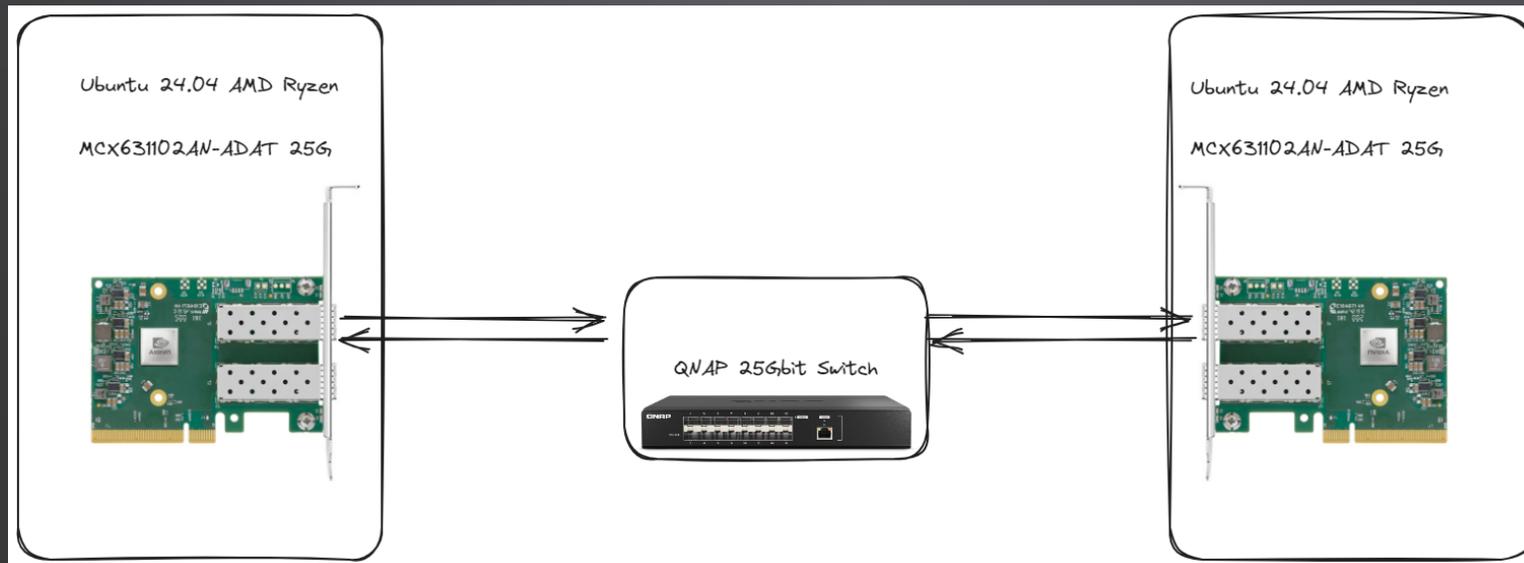
VDI, RDMA and GCCG

phrame, VDI and RDMA uncompressed networking in the cloud



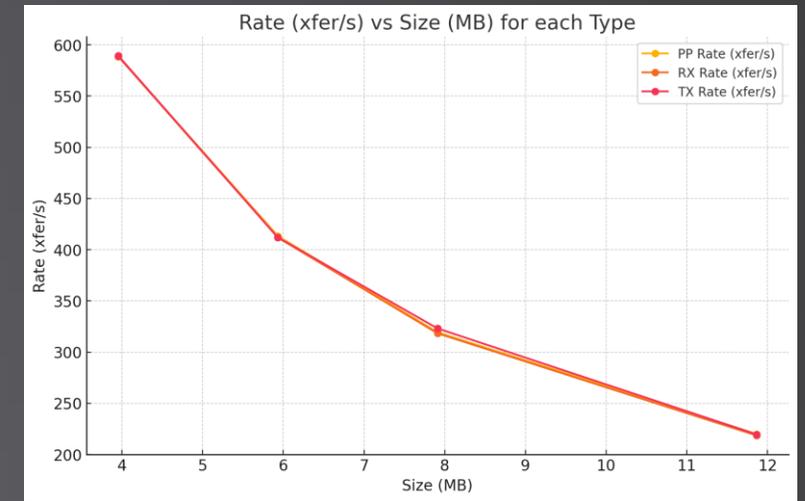
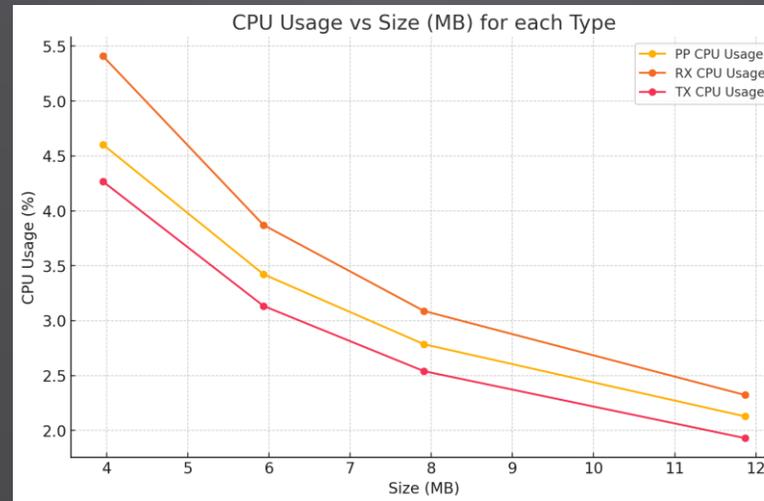
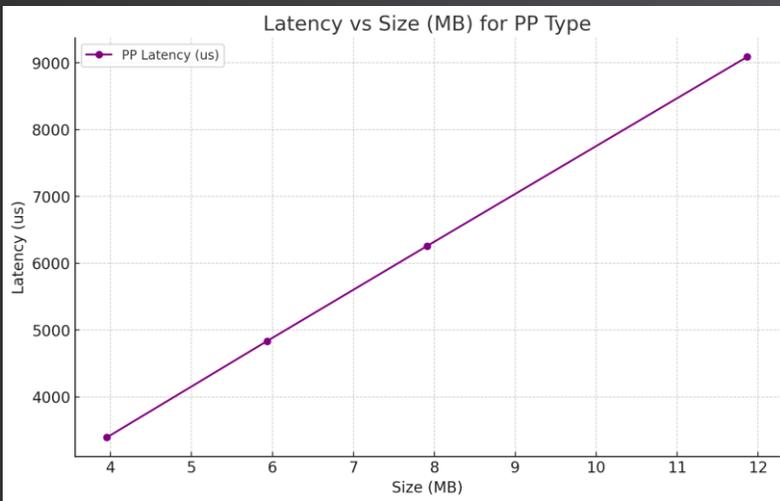
VDI, RDMA and GCCG - performance

- ❑ Setup on 2 hosts with 25gb NIC's and QNAP Switch
- ❑ Tests run with TX, RX and Full Bi-directional flows
- ❑ 8 bit and 16 bit 1920x1080 frames with YUV 422 and YUVA 422.
- ❑ Single threaded test application.
- ❑ Setup to use 1518 byte frames



VDI, RDMA and GCCG - performance

- ❑ 1920 x 1080 p 8 bit 422 YUV = 4,147,200 Bytes per Frame
- ❑ 1920 x 1080 p 8 bit 422 YUVA = 6,220,800 Bytes per Frame
- ❑ 1920 x 1080 p 16 bit 422 YUV = 8,294,400 Bytes per Frame
- ❑ 1920 x 1080 p 16 bit 422 YUVA = 12,441,600 Bytes per Frame



VDI, RDMA and GCCG - comments

- ❑ CPU performance is for a single core of 16 core system – very low CPU
- ❑ CPU demand increases with frame rate not with data rate - setup time
- ❑ We would anticipate that these rates would be proportional to line rates
- ❑ Implies UHD on 100 gbit NIC achieves same frame rates
- ❑ 25 gbit NIC supports 5 x 1080p60 16 bit flows
- ❑ 100 gbit NIC supports 20 x 1080p60 16 bit flows
- ❑ 400 gbit NIC supports 80 x 1080p60 16 bit flows
- ❑ 128 port 400gbit switch < \$50,000 = 10,240 bidirectional flows

Multiviewer - Control surfaces

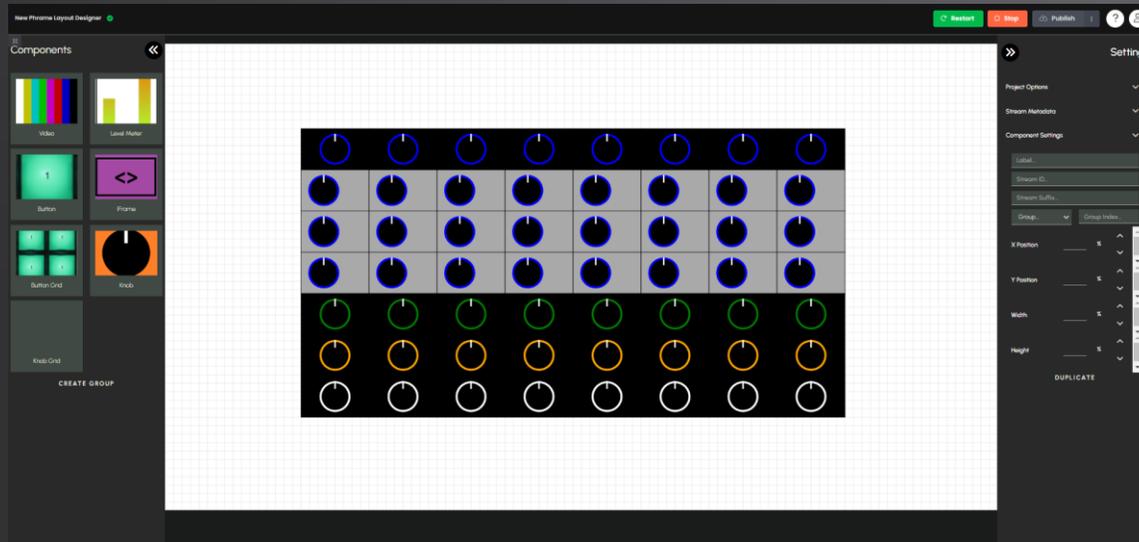
The screenshot displays a professional video multiviewer control interface. At the top left, there are navigation icons (three horizontal lines and a square). The main area is divided into several sections:

- Top Left:** A grid of four camera preview windows. The top-left window shows an indoor event space with a sign that says "LA". The top-right window shows a green field with a pink flower and text: "LIVE STREAM POWERED BY LARIX BROADCASTER". The bottom-left window shows a waterfront scene with a sign that says "Docks". The bottom-right window shows a street scene with a sign that says "Ipswich".
- Top Center:** A yellow circular gauge showing a value of 74.58, with a scale from 0 to 100. To its left are two small circular icons: a green one with a white 'S' and a red one with a white 'x'.
- Top Right:** A white box containing a red digital timecode: "09:47:16:11".
- Middle Right:** A large video preview window showing an outdoor street scene with a sign that says "Output". The SMPTE logo is visible in the top left corner of this window.
- Bottom Left:** An "Image Panel | Headline" control area. It features a dark background with a small SMPTE logo and a set of navigation icons (back, play, search, help, and a dropdown arrow). Below this is a section with "Image Panel", "Customize", and "Settings" tabs. At the very bottom, there is a label "Image Panel" and a red icon.
- Bottom Center:** A row of four green rectangular buttons labeled "LA", "Felixstowe", "Docks", and "Ipswich".
- Bottom Right:** A vertical audio level meter with a scale from 0 to 100. The current level is indicated by a yellow bar at approximately 82.09.

Multiviewer - Operator Consoles

- Support Behringer Xtouch devices
- Onscreen rotary controls

Phrame Designer



Real Mixer



Live Demo

