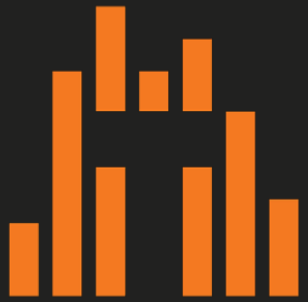

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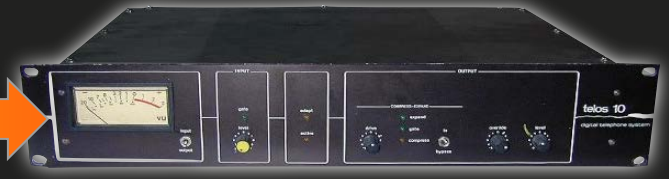
LOVE WHAT YOU HEAR

Real Radio Hosts Working Virtually:

How Real Humans Work with Containerized Broadcast Systems

Kirk Anders Harnack
Senior Solutions Consultant
Telos Alliance

40 Years of Broadcast Tech on 5 Slides



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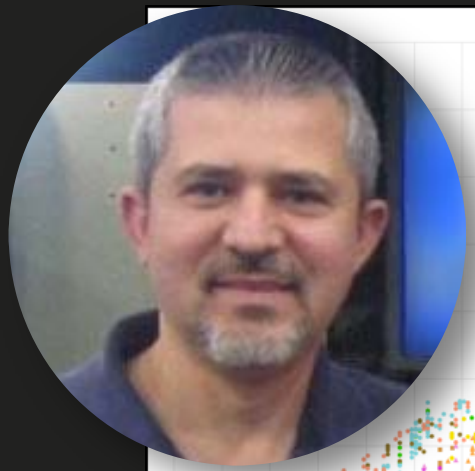
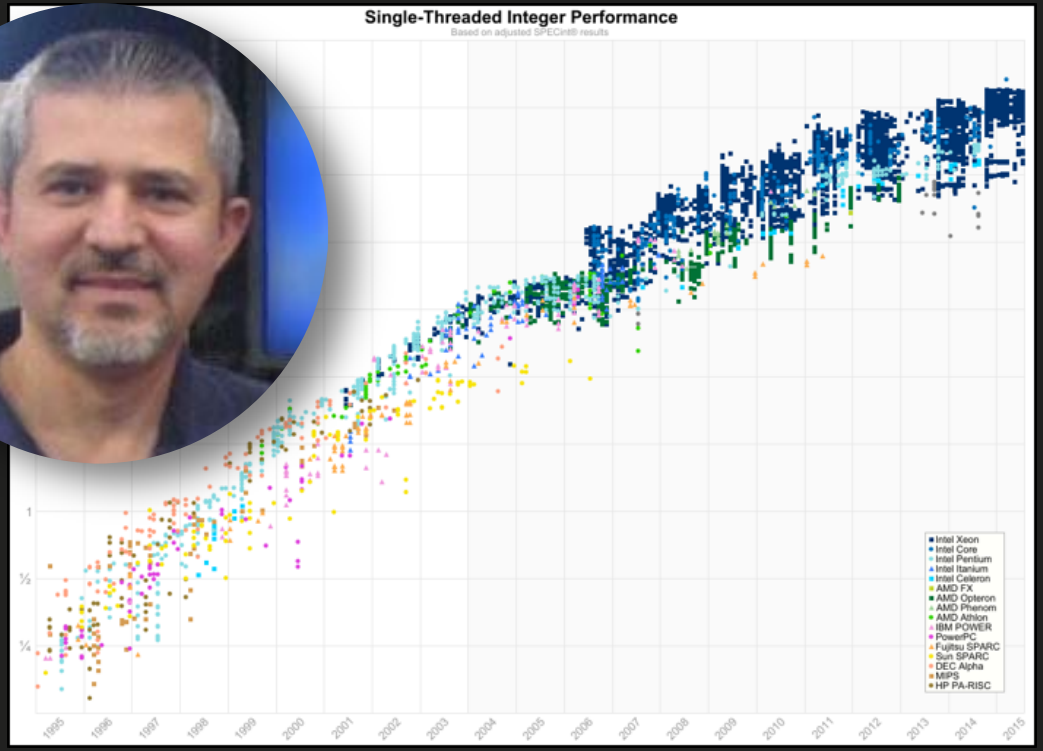
40 Years of Broadcast Tech on 5 Slides





CPUs Got More Powerful. A Lot More.

Ioan Rus, Senior Coding Developer at **Telos Alliance**, explains...

"We moved from a purpose-built world to a more generic platform world. Commodity hardware and commodity software is largely able to replace their proprietary predecessors."

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40 Years of Broadcast Tech on 5 Slides

Telos Alliance

40 Years of Broadcast Tech on 5 Slides

Telos Alliance

40 Years of Broadcast Tech on 5 Slides

IP Intercoms

Virtual Mixers

IP Codecs

Audio Processors

Talkshow Systems

Automation
Playout

Telos Alliance

IP is the Most Versatile Tool ever adopted in Broadcasting

What if?

- **Broadcast equipment were “apps” on a server?**
  - Installed or shut off in minutes
  - Paid for only when used
  - Controlled from anywhere
    - Home
    - Other offices
    - Sports venues
    - Live remotes

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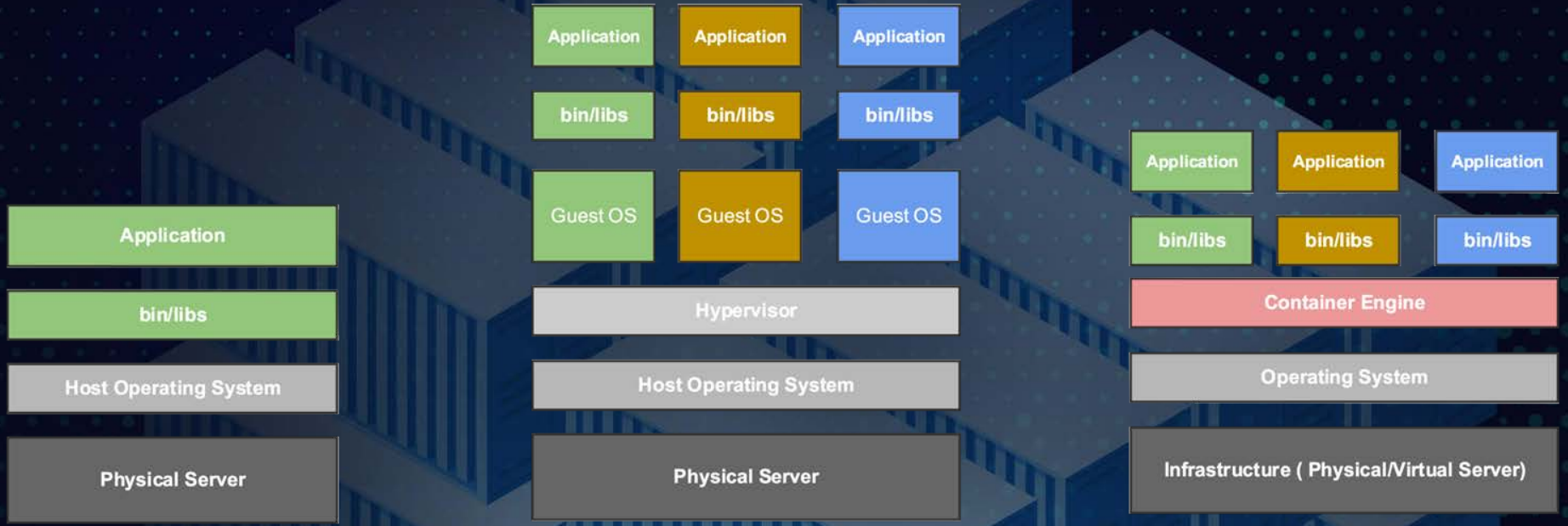
Evolution of Virtualization



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Virtual Software Deployment

There are two main platforms for deployment of software:

Virtual Machines
(Installed on a Hypervisor)

Containerized
Software

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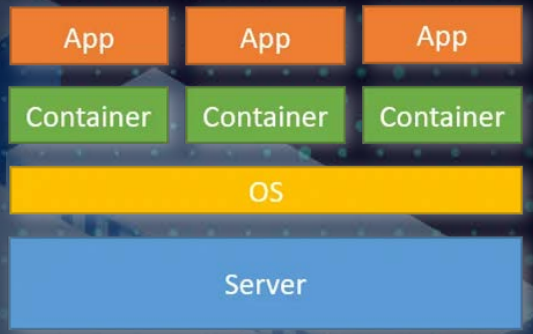
Why Virtual Machines & Containers?

Greg Shay
Chief Technology Officer

Telos Alliance

Containerized Software



The Future of Computing Services

- Microservices in containers are the industry future trend for software.
- Used by IT-forward-thinking large organizations like Google, Amazon, Visa, PayPal, and Metlife for critical applications.

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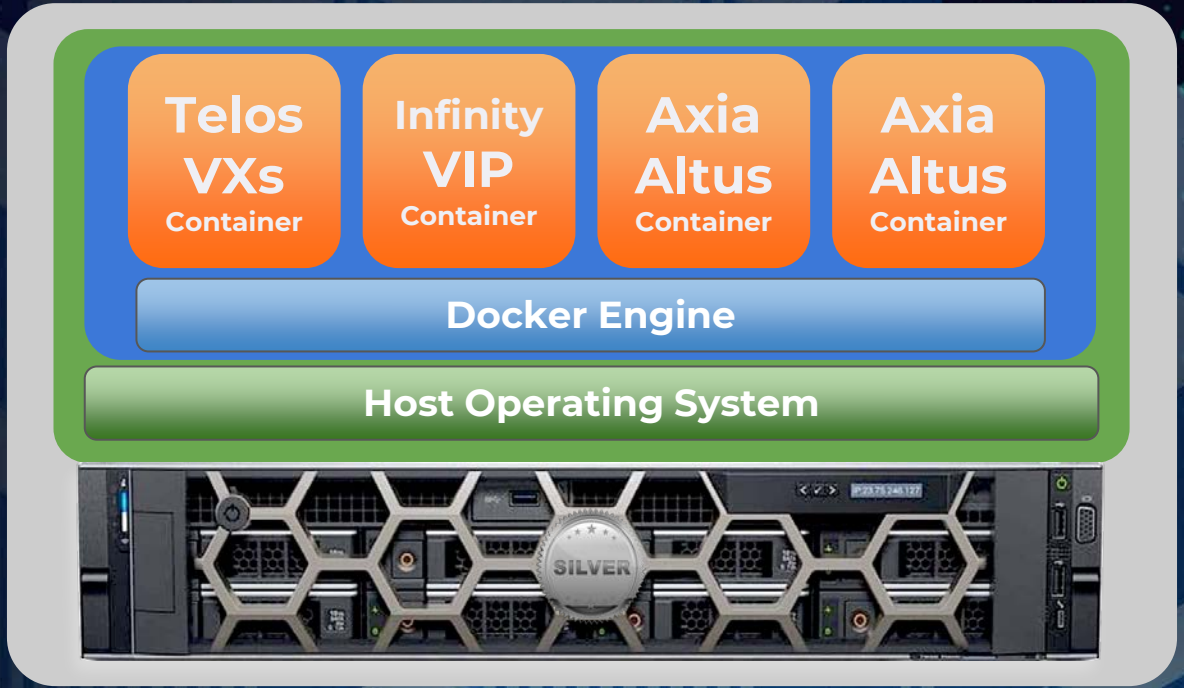
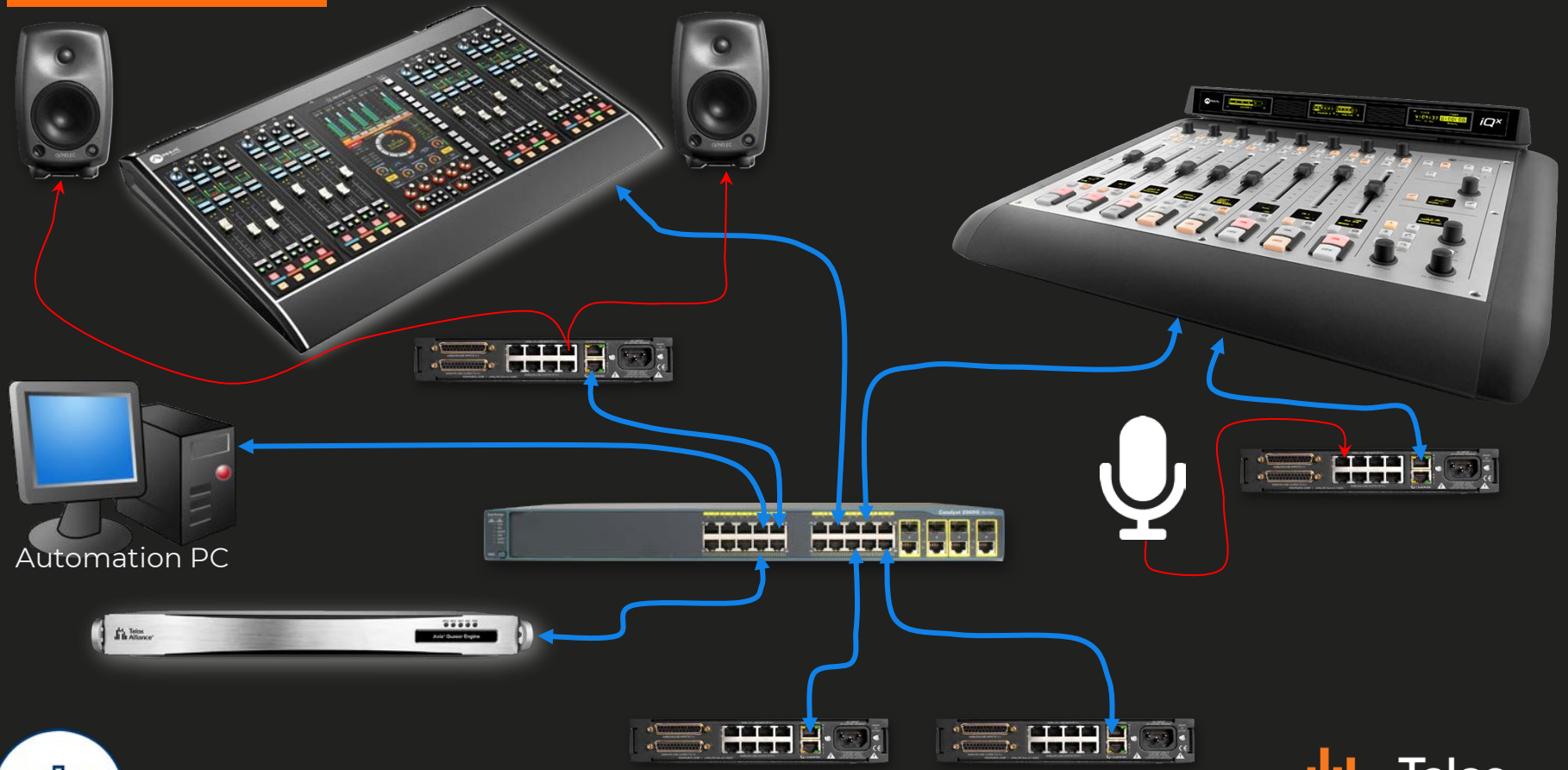
What is Containerized Software?

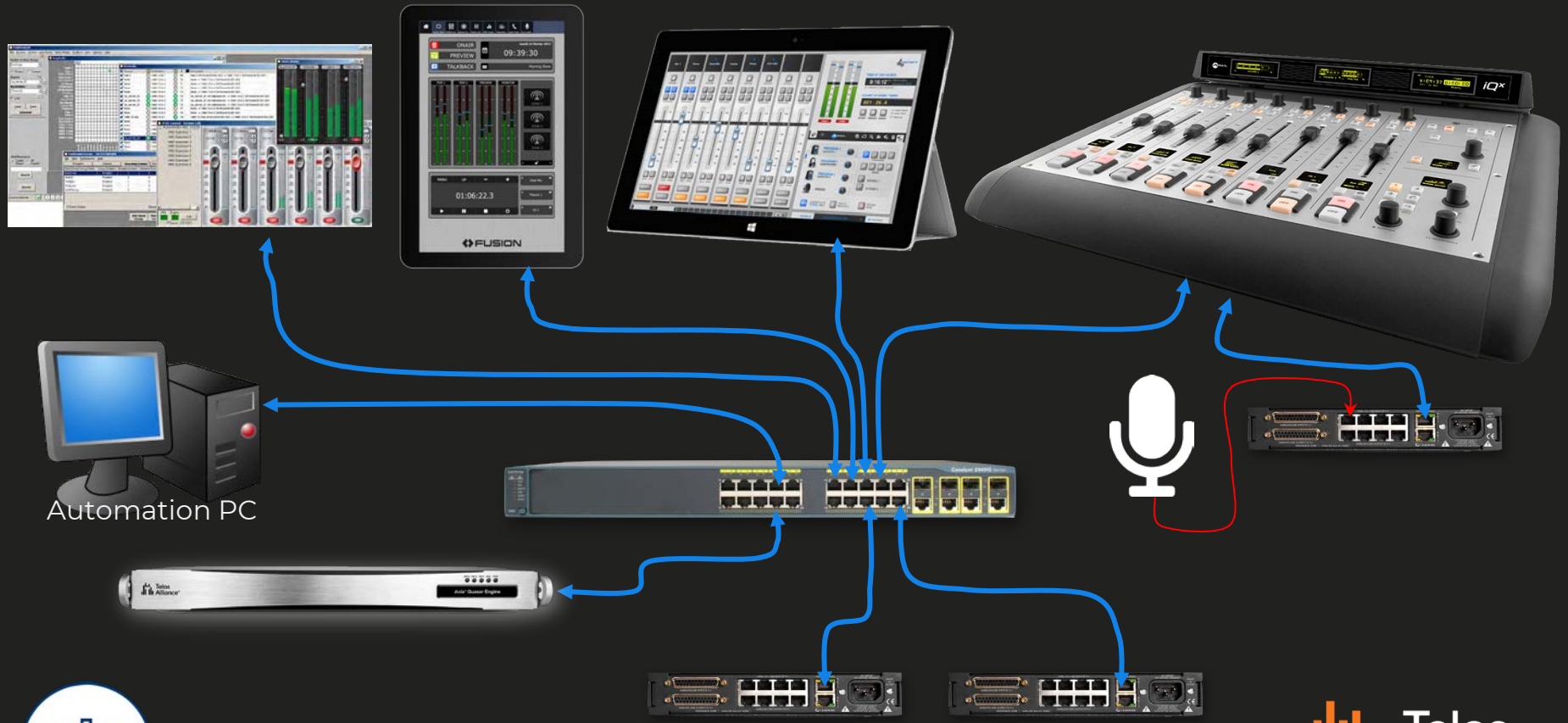
Jake Alderman
Virtual Solutions Program Manager

Telos Alliance

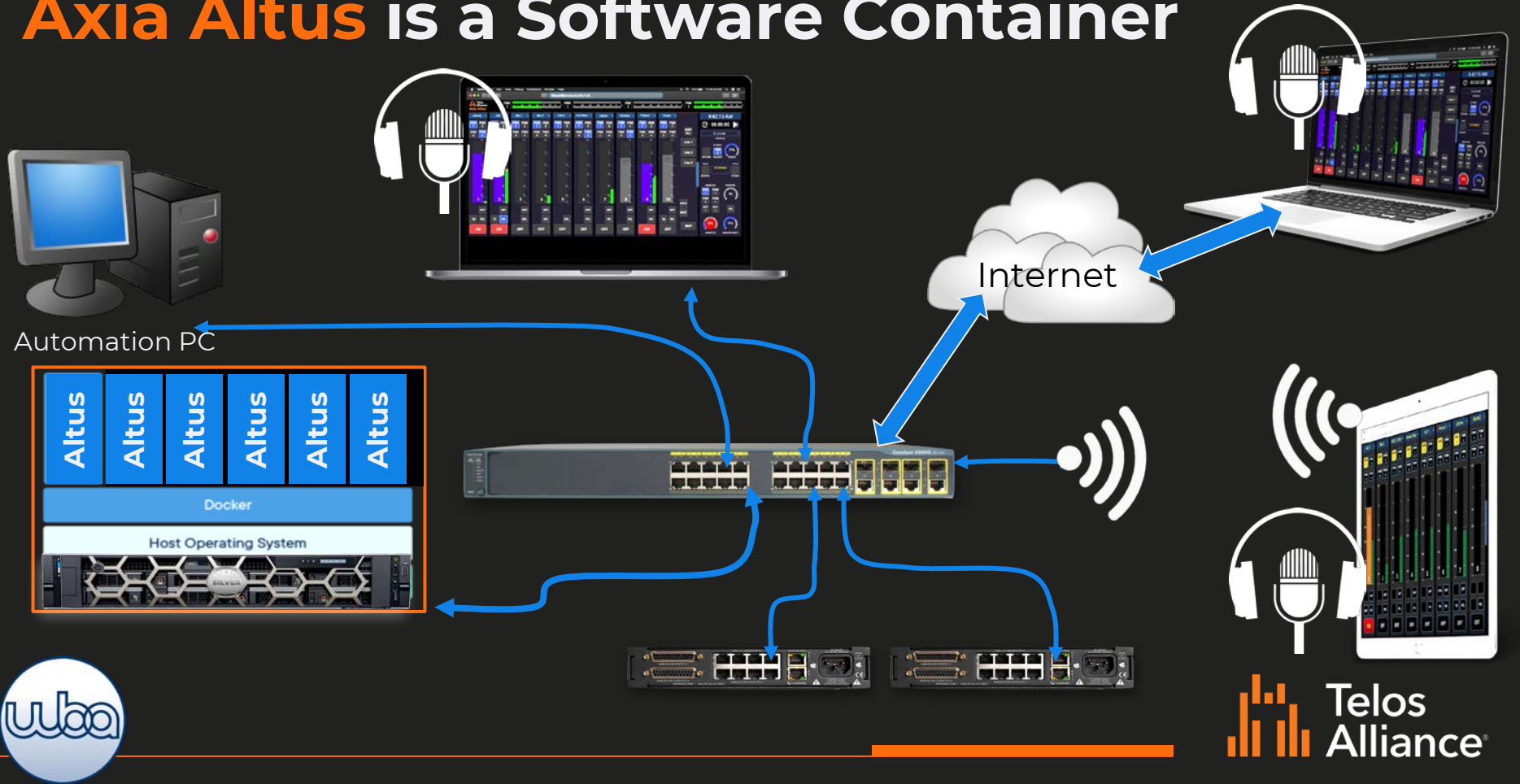
Different Functional Containers




Automation PC


FUSION
Automation PC

Axia Altus is a Software Container



Broadcast Applications
Virtual Audio Mixer

- Audio mixing without a physical surface
  - HTML5 browser-based control
- Temporary studio anywhere
- Distributed / remote workforce
- Home studios don’t need a purpose-built mixer
- Small studios, desks, even mobile
- Multiple simultaneous users

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Add to Existing Studios

- Add an audio console without buying control surface hardware.
- Add mixing for extra events like sports or holiday programs.
- Monitor and control other cluster stations.

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Create Extra Mixers

- Replace legacy audio consoles.
- Smaller footprint returns desk space.
- Fits in small rooms and on small desks.

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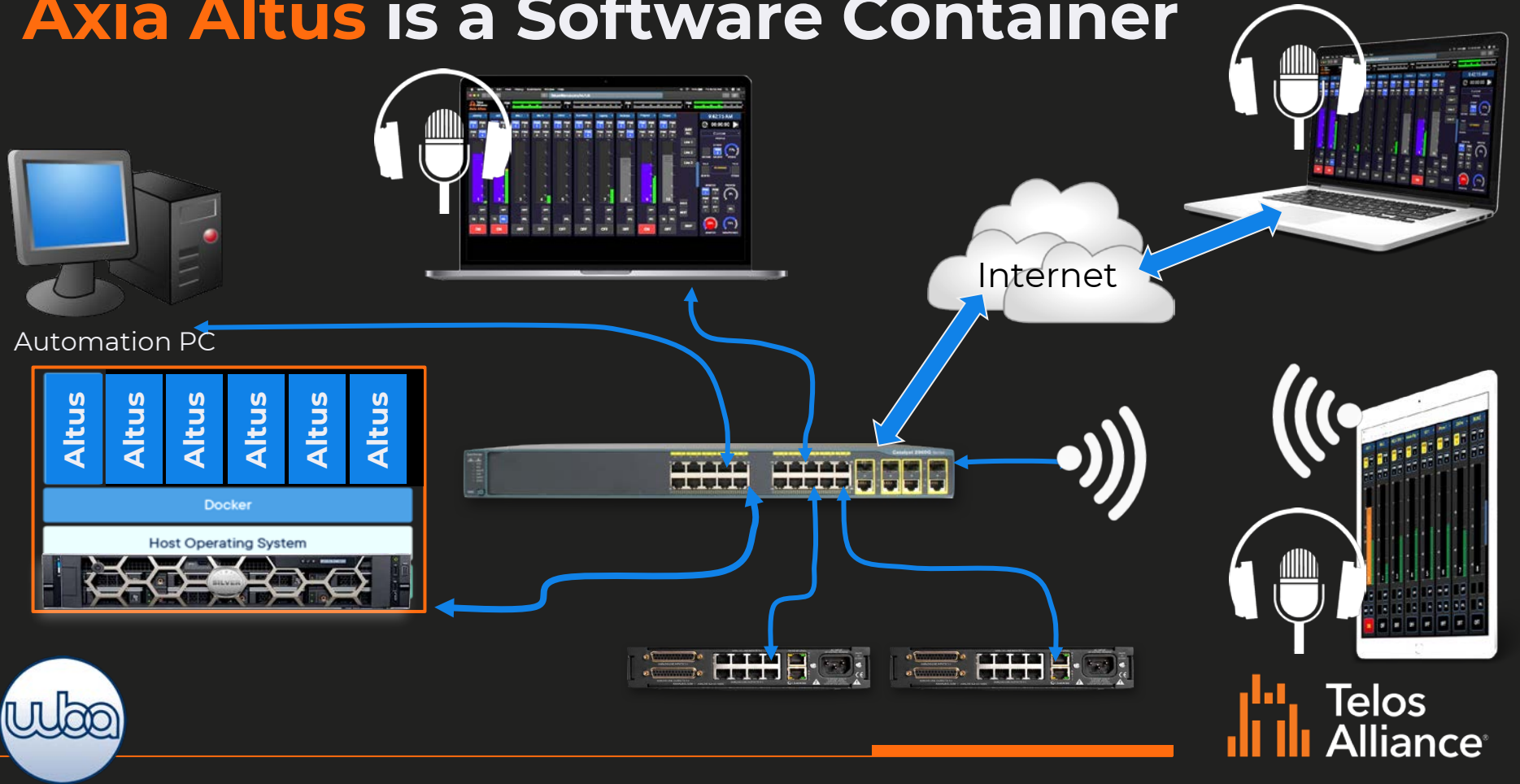
Mix from Any Desk

- Use existing office PCs as control surfaces.
- Works with touchscreen or mouse.
- Any desktop PC, laptop, tablet or phone controls an Axia Altus mixer.

Axia Altus is a Software Container



Broadcast Phone System

- Granular system sizing
- Deployment flexibility: On-Prem, Data Center, Cloud
- Buy-out or subscription
- VXs investment lasts beyond the life of purpose-built hardware

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Container-Based Virtual IP Intercom

Telos Infinity VIP

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Containers and Telos Software

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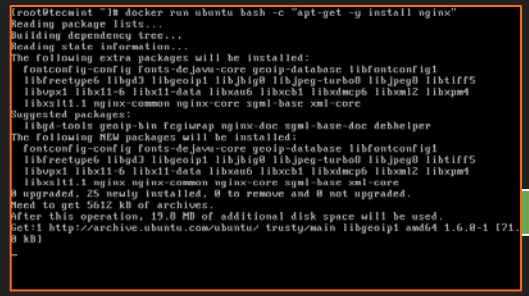
Other Software Containers

Where to Deploy Axia Altus?

Audio Mixer

Delivered and Installed as Software
Controlled over a network (Local or Remote)
Operated using a web browser



Axia Altus
Software Container

Compute Platform
On-Prem or Cloud

User “Console”
In any Browser

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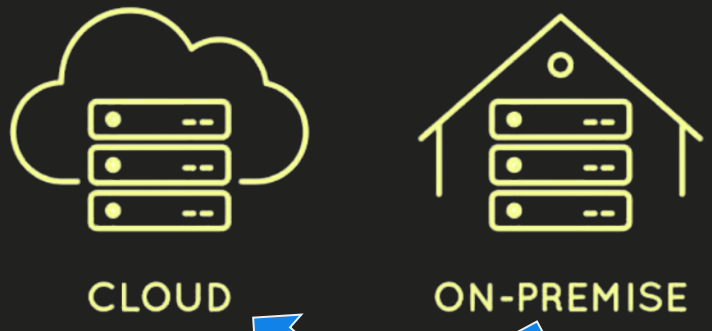
Where to Deploy Axia Altus?



Axia Altus may be installed...

- On-Premises using customer's qualified hardware.
- On-Premises using Telos Alliance hardware
- Private Data Center or AWS Cloud

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REAL CONTAINER USERS, REAL STORIES

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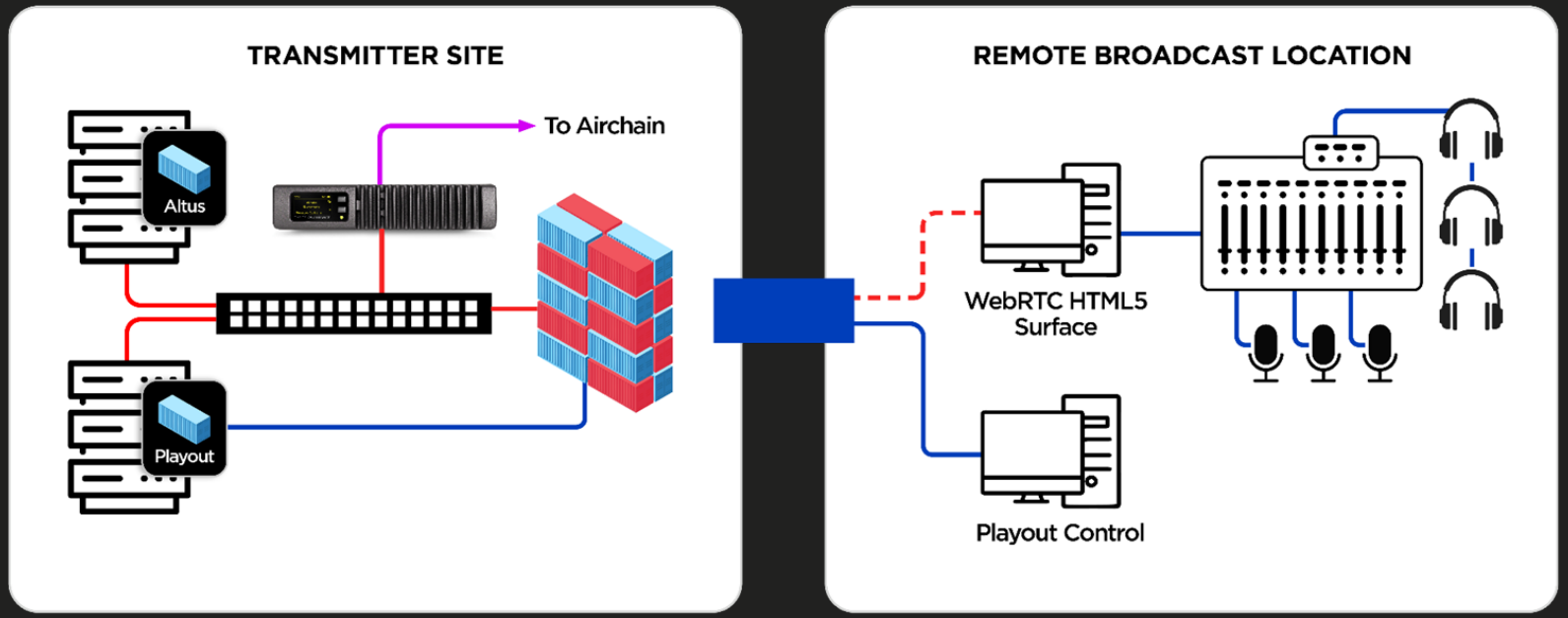
The Story of Our Homelessness

Jeff McGinley

Telos Alliance

Centralized Ops / Dispersed Talent

Jeff McGinley



- Quick build & deployment was critical
- Hosted at the transmitter site - great Internet there
- Local audio mixing and monitoring in local analog hardware
- A model for future projects in cost savings?

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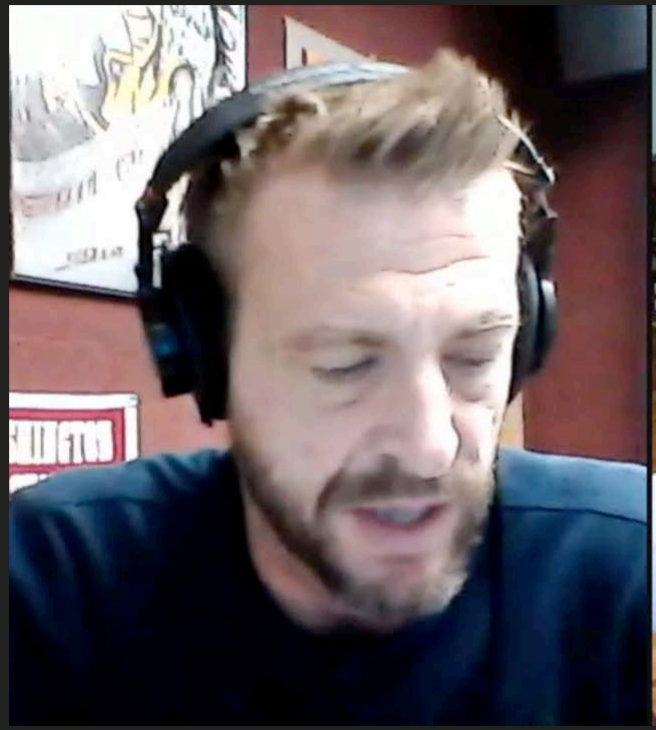
Remote Access Security

Jeff McGinley

Morning Team SPLITS UP



Jeff Kingman

Jeremy West

Telos Alliance

Altus is a GREAT CONSOLE!

Jeremy West

Right at Home, Altus is a GREAT CONSOLE!

Jeremy' Axia Altus

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How We Use CONTAINERIZED SOFTWARE

Thane Conriocht

wba

Telos Alliance

How We Use CONTAINERIZED SOFTWARE

KZLF-FM - Werewolf 97.5

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Virtualization Makes BETTER RADIO

Thane Conriocht

Small Broadcasters Get BIG BENEFITS

Thane Conriocht

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Boomers & TOUCHSCREENS

Jeff McGinley

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IP is the Most Versatile Tool ever adopted in Broadcasting

Modern-Day Scenario:

New FM-HD1+HD2+HD3
Mostly Automated
Live-Local Morning Show
No Line-of-Sight
Excellent Fiber Internet

Internet

- FM Analog via µMPX
- HD1, HD2, HD3 via Nautel E2X

- PlayoutONE Server
- PlayoutONE FM/HD1
- PlayoutONE HD2

- PlayoutONE HD3
- FM, HD Stream Processing / Streaming
- Ingest

- Nautel Multicast+ Imp/Exp
- Axia Altus / Telos VXs
- Spare

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- Axia Altus / Telos VXs
- Spare

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- Spare

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Internet

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- PlayoutONE Server
- PlayoutONE FM/HD1
- PlayoutONE HD2

- PlayoutONE HD3
- HD Stream Processing / Streaming
- Ingest

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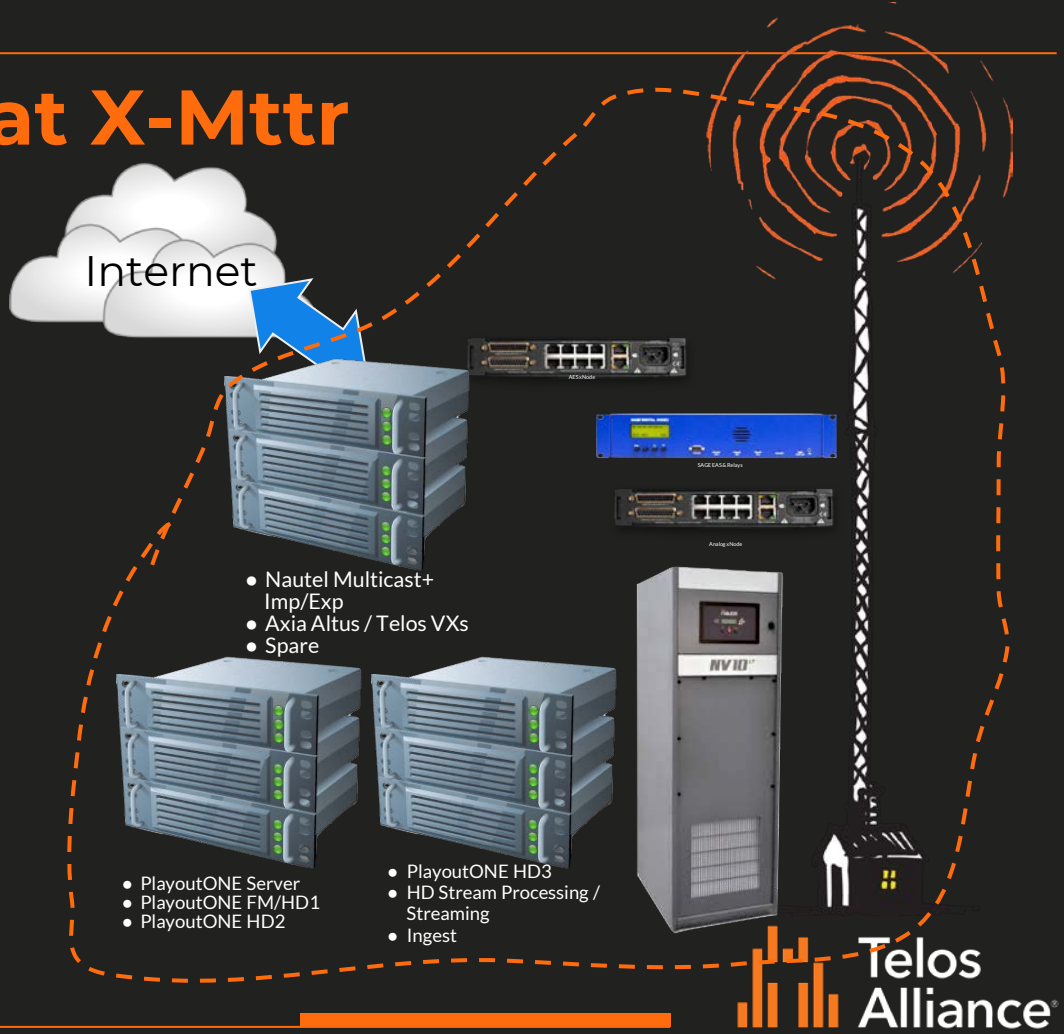
WBZK-FM All Eqt at X-Mttr

- Automation Systems
- Audio Mixing Console
- On-Air Phone System
- Audio Processing
- HD Exporter/Importer
- HD FM Exciter/X-Mttr
- Stream Encoding



Virtualized Operation for THE BUZZ

WBZK-FM/HD Virtual
Main Studio

WBZK-FM/HD Altus
Console, & VXs Phones

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Single Talent Remote - Easy

- Remote Host Working Alone
- Easy - just like a remote CODEC feed
- 1 Contribution feed
- 1 Mix-Minus feed

Internet

- Nautel Multicast+ Imp/Exp
- Axia Altus / Telos VXs
- Spare

- PlayoutONE Server
- PlayoutONE FM/HD1
- PlayoutONE HD2

- PlayoutONE HD3
- HD Stream Processing / Streaming
- Ingest

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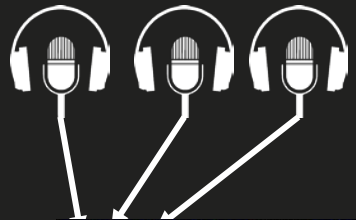
WBZK-FM Everything at the X-Mttr



Internet

Analog xNode EAS Loop-Thru

HD2, HD3, Stream Proc

AES xNode

Nautel HDFM Exciter

Nautel VS 2.5 Amplifier

Axia Altus Telos VXs WebRTC

The Buzz Automation

Oldies Automation

The Beat Automation

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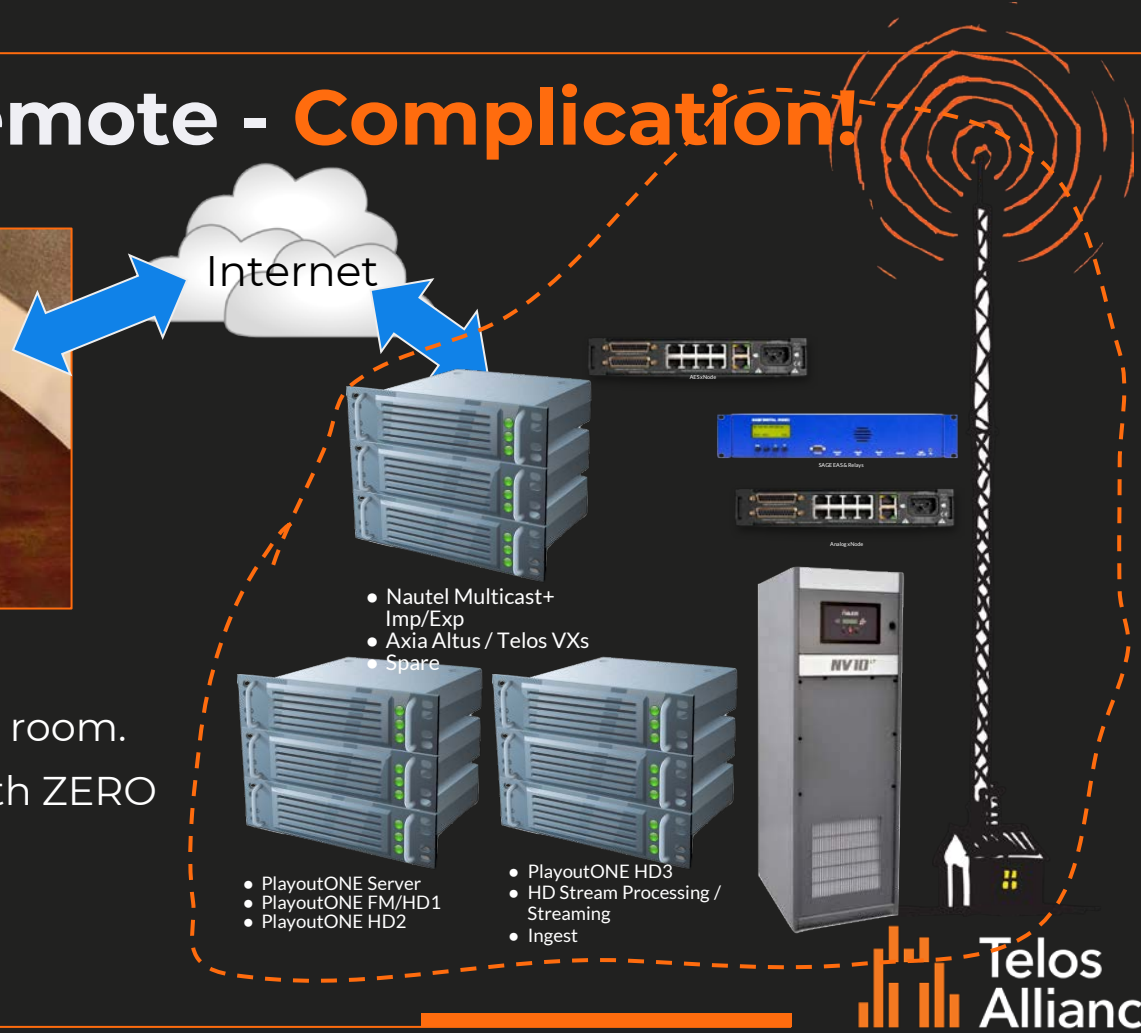
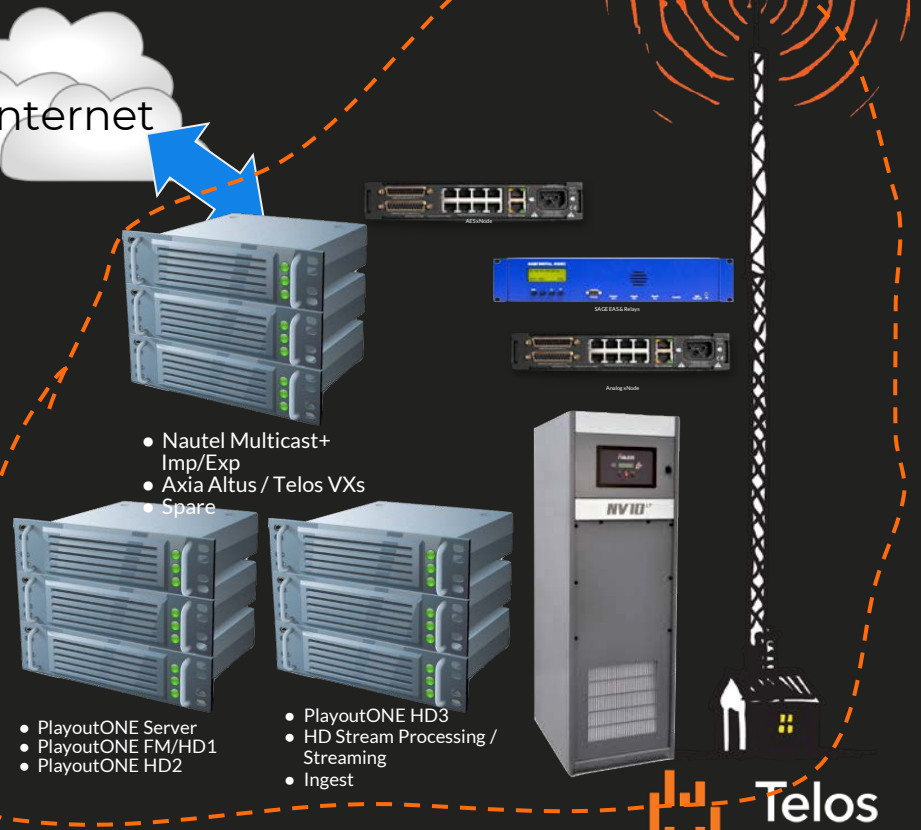
Multi-Talent Remote - Complication!

- Complication!
- Several mics in the same room.
- Must hear each other with ZERO delay (or close)



Multi-Talent - Local Mic Mix

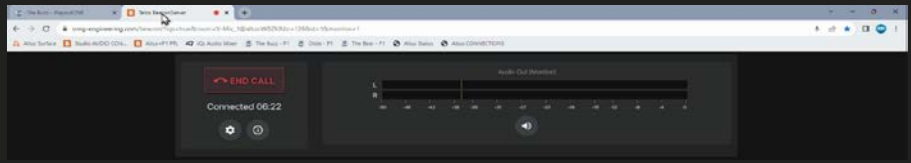
- Requires local mic mix
- Send mix of mic (& other local audio) to remote (main) mixer



Multi-Talent - Headphone Mix

- Headphone Mix for Local Talent
- Mix of local mics
  PLUS
  Mix-Minus from the remote (main) Mixer

Main Studio Remote Audio Connections



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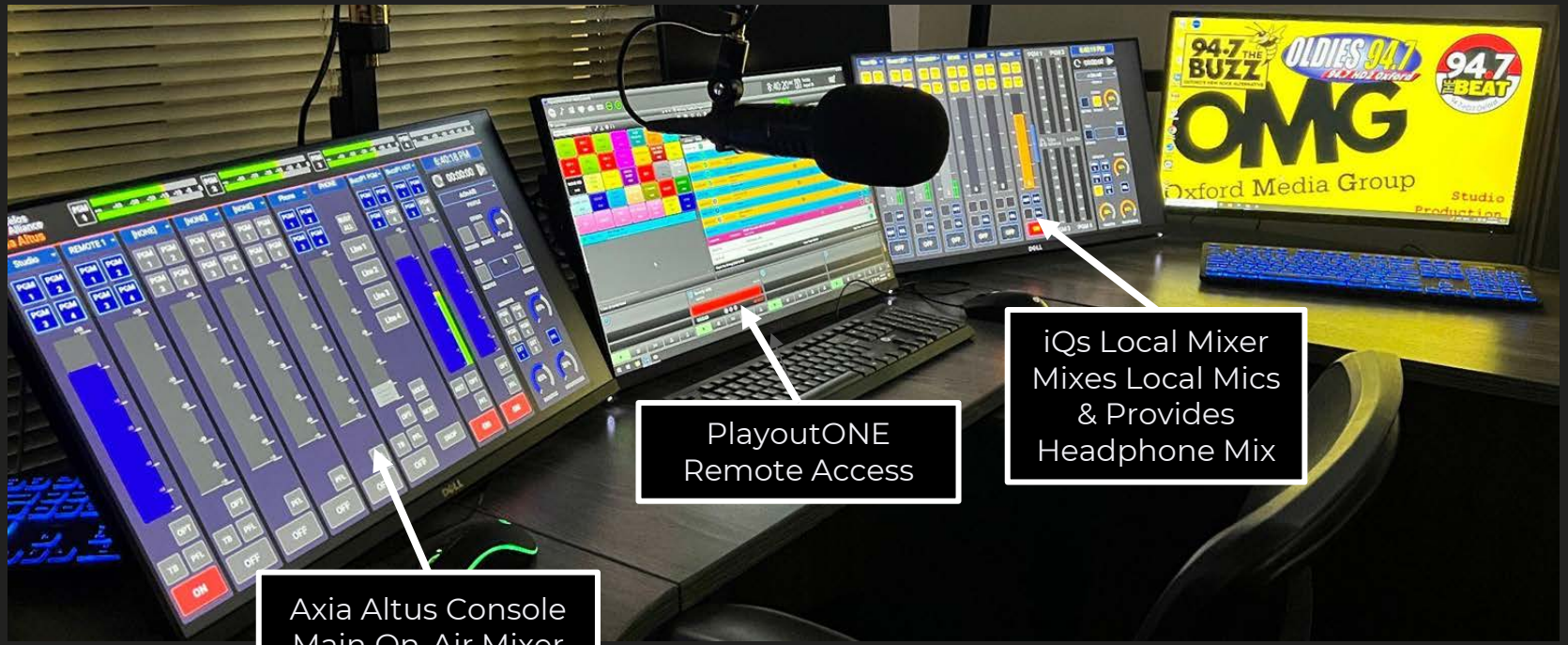
Main Studio Monitor Routing

WBZK-FM Control Room



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Clean Digital Audio for THE BUZZ

Chris Green

WBZK-FM Control Room

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Axia Altus

Timely Tips

- Remote Access..
  - DWService.net

- SIP Telephony
  - ClearlyIP.com
    - FreePBX

- “VPN Killer” - Secure Tunnel
  - Avoids Mistake-Prone VPNs

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Learn About Software Containers

CONTAINER UNIVERSITY

wba

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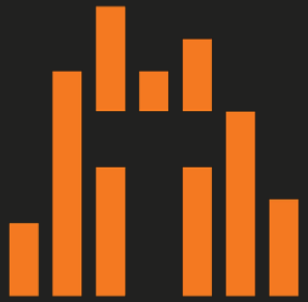
Mom Wants a Picture, please...

Text: 615 423-0053
E-mail: kirk@harnack.com



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