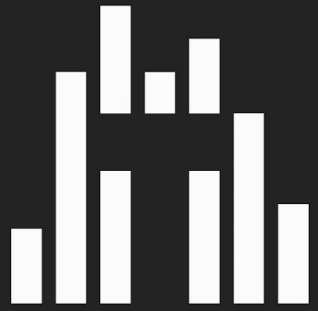


Telos Alliance

LOVE WHAT YOU HEAR

Practical Virtual and Cloud Broadcast Infrastructure

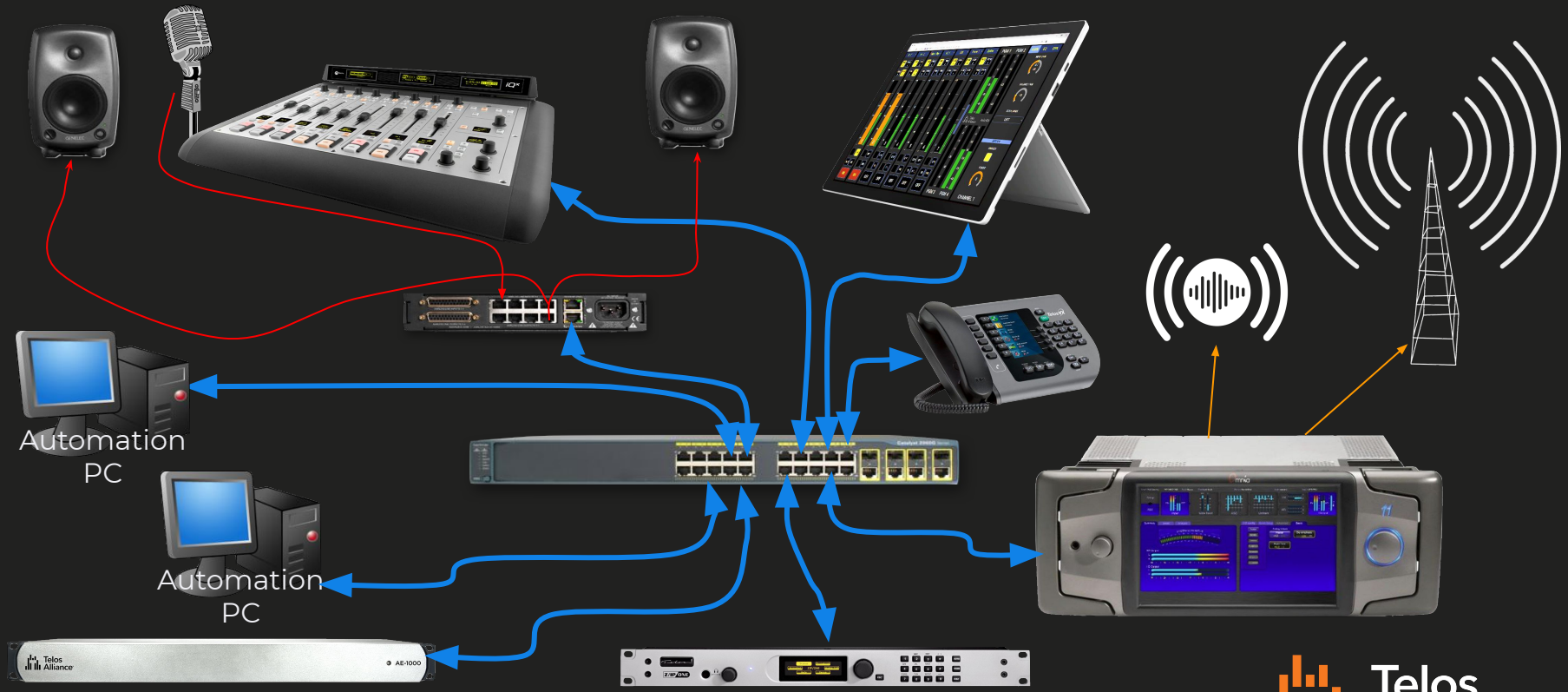
Kirk A. Harnack
Telos Alliance

Telos Alliance®

Console-Centric Studios

Telos Alliance®

Audio Architecture is Network-Centric

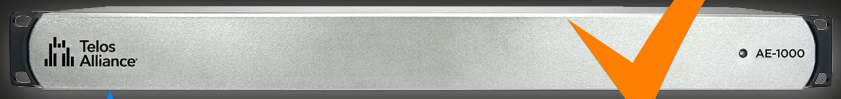


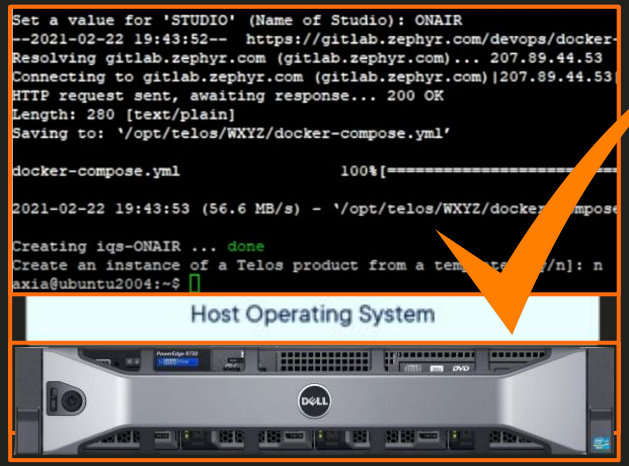
Telos Alliance®

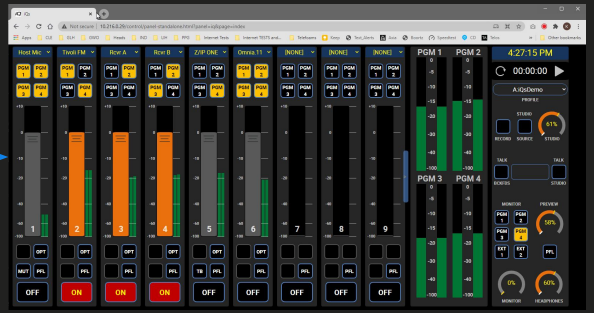
What Would A Virtual Mixer Look Like?

Telos Alliance®

What Would a Virtual Mixer Look Like?







Controlled by a Web Browser

Telos Alliance

Form Factors: Appliance?

Telos Alliance AE-1000

Telos Alliance®

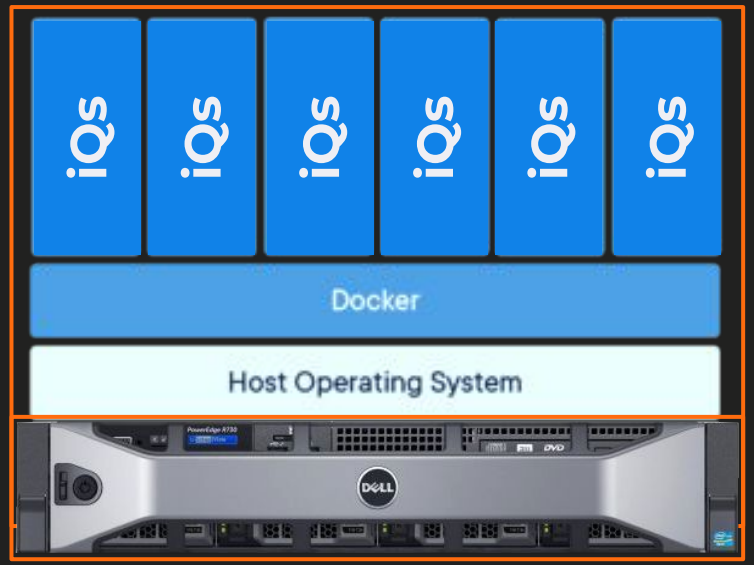
Form Factors: Containerized Software?

```
Set a value for 'REPOSITORY' (URL of Docker repository. Leave bla
Set a value for 'TAG' (Version of software. Leave blank to use de
Set a value for 'STUDIO' (Name of Studio): ONAIR
--2021-02-22 19:43:52--  https://gitlab.zephyr.com/devops/docker-
Resolving gitlab.zephyr.com (gitlab.zephyr.com)... 207.89.44.53
Connecting to gitlab.zephyr.com (gitlab.zephyr.com)|207.89.44.53|
HTTP request sent, awaiting response... 200 OK
Length: 280 [text/plain]
Saving to: '/opt/telos/WXYZ/docker-compose.yml'

docker-compose.yml                  100%[=======================

2021-02-22 19:43:53 (56.6 MB/s) - '/opt/telos/WXYZ/docker-compose

Creating iqs-ONAIR ... done
Create an instance of a Telos product from a template? [y/n]: n
axia@ubuntu2004:~$
```



iQs Docker Container for Server Deployment

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Broadcast Applications

- 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 Axia 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.
- iQs works with touchscreen or mouse.
- Any desktop PC, laptop, tablet or phone controls an Axia iQs mixer.

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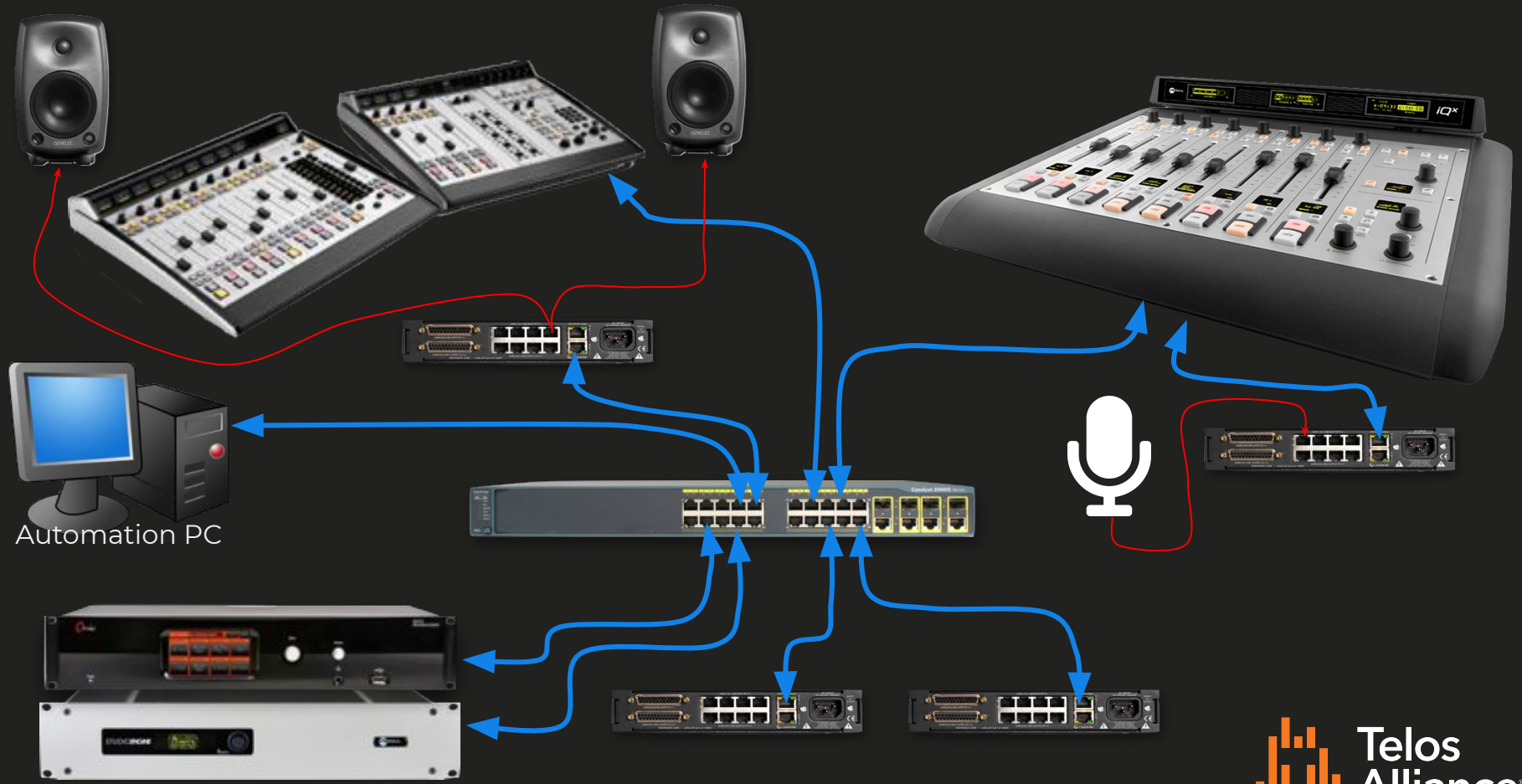
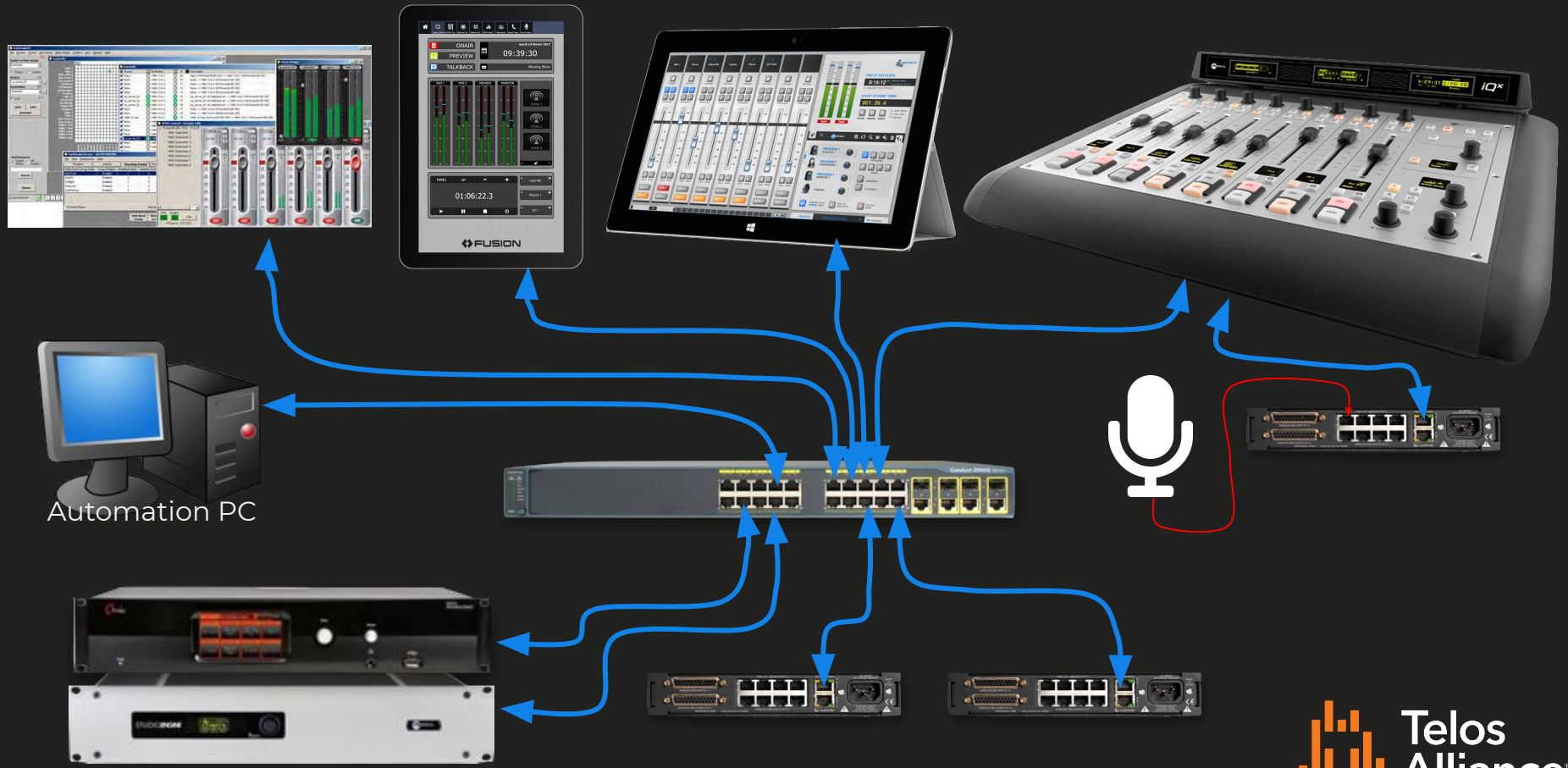
Virtual Mixing
Technology



Telos Alliance®



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Automation PC

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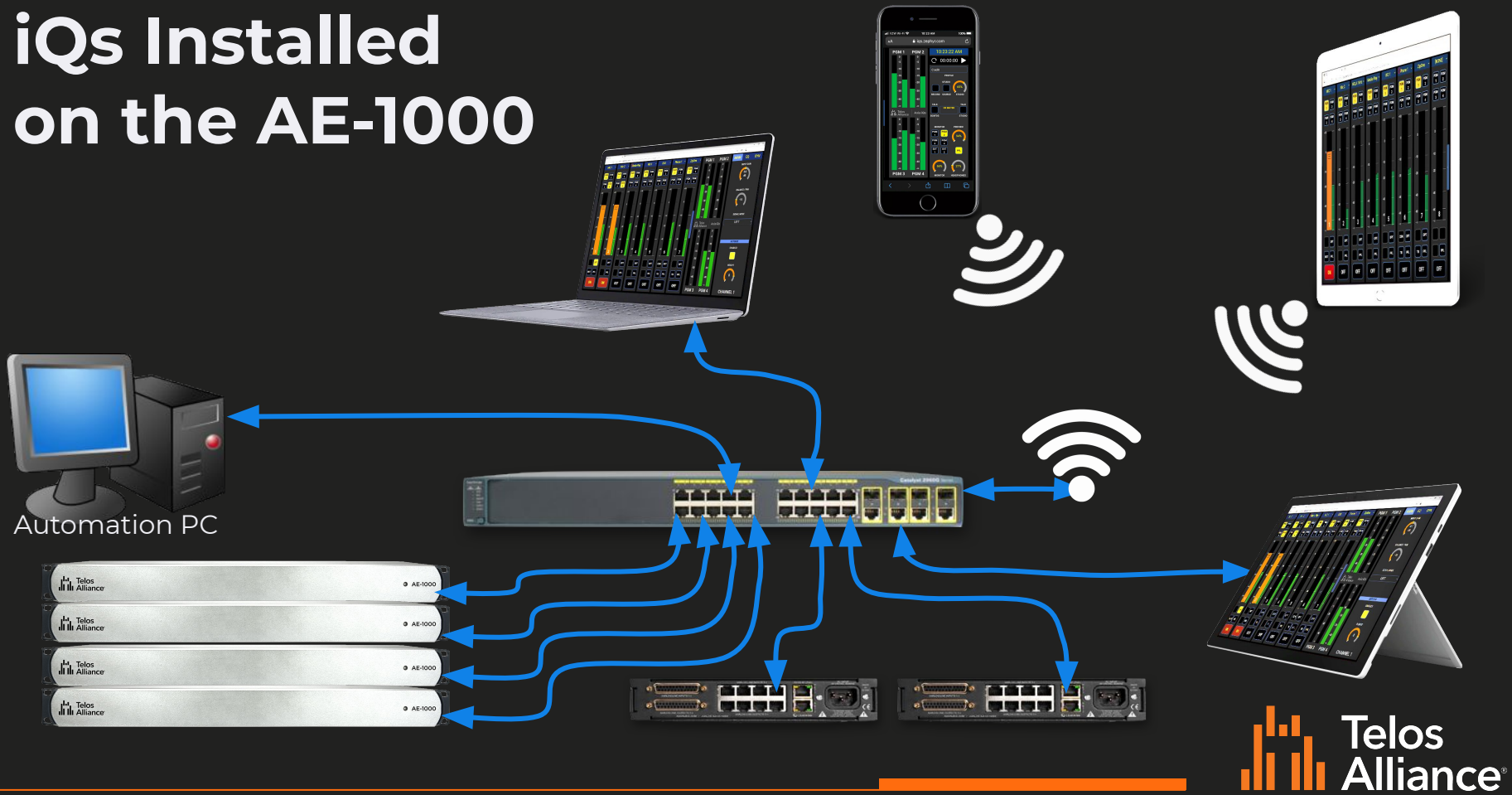
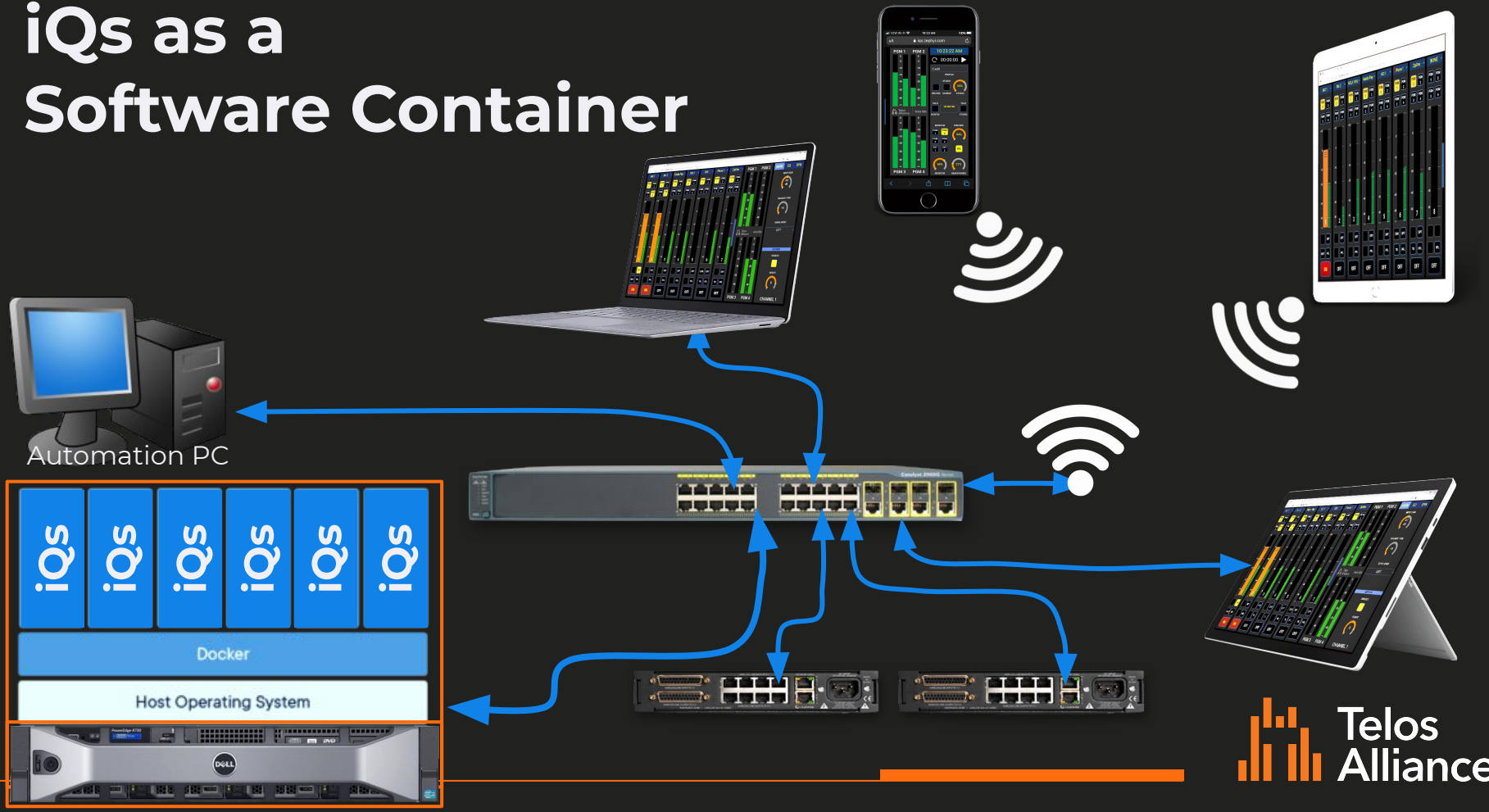
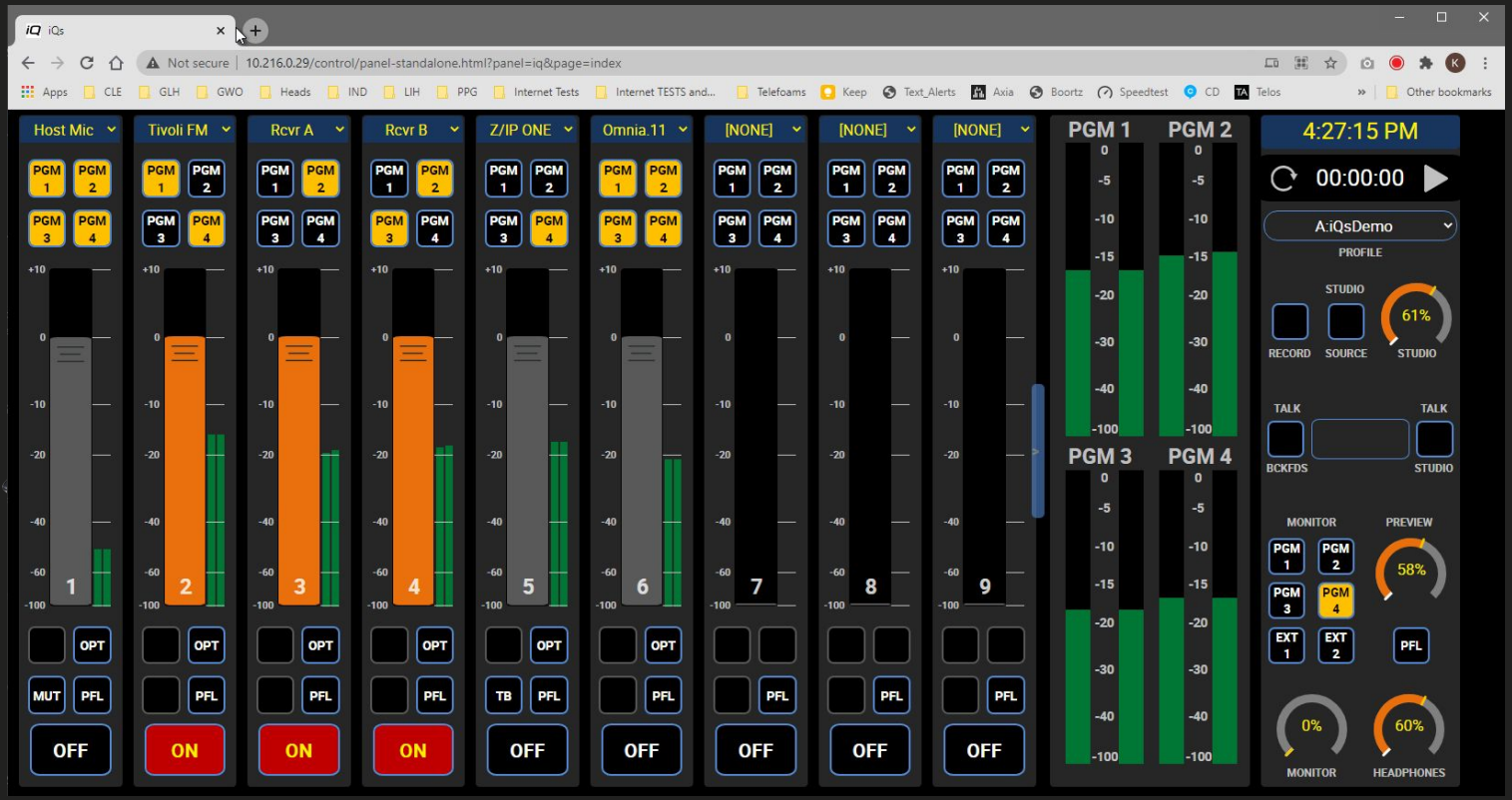
iQs Installed on the AE-1000



iQs as a Software Container



Axia iQs - Control with Any Modern Browser



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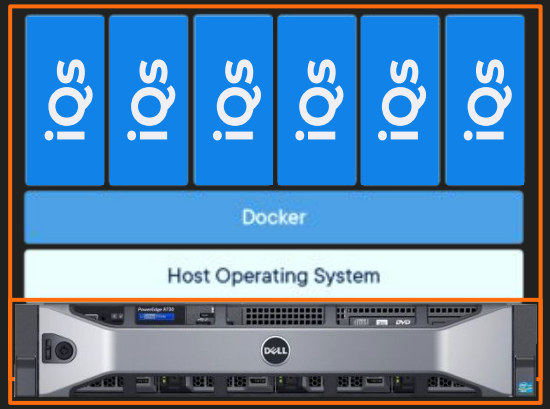
Deployment Options

Telos Alliance AE-1000
with
Axia iQs Pre-Installed



Axia iQs
Containerized
Software

Telos Alliance

Axia iQs - Installing the AE-1000 + iQs

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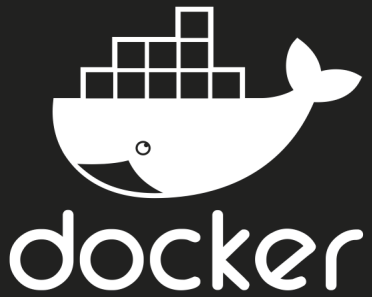
Telos Alliance
AE-1000
Telos VX

Virtual Software Deployment

There are two main server platforms for deployment of software:

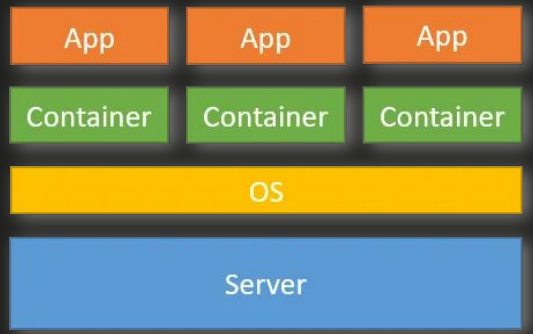
Virtual Machines
(Installed on a Hypervisor)



Containerized
Software

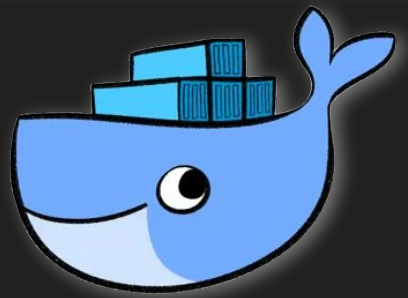
Telos Alliance®

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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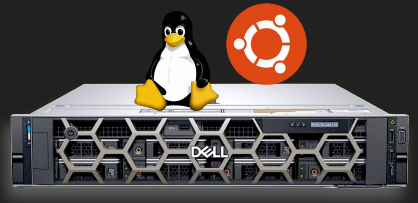
Docker and Telos Software

Docker Engine installed on Ubuntu OS

iQs container is downloaded from Quay

Docker Engine installed on Ubuntu OS



Telos Alliance

Installing the Software Container

- Axia iQs - Virtualized
- Runs as a Docker container on Linux
- Locally, on-prem
  or
  in Private or Public Cloud
- Literally installs in minutes

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ON THE
KCRW

Poll Question:

What is your level of expertise on containerized software?

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Axia iQs - Installation Location

- Axia iQs On-Premises
  - AE-1000 + iQs
  - iQs server deployment
- iQs server deployment in a private data center
- iQs server deployment in a Public Cloud data center, such as AWS.

Telos Alliance®

Key Takeaways

Axia iQs is a Software Audio Console

- Touchscreen-optimized Audio Mixer GUI in your browser
- Any desktop PC, laptop, tablet or phone controls an Axia iQs mixer.
- Works with touchscreen or mouse.

Telos Alliance®

Key Takeaways

iQs Software Container

AES67 Livewire+

Axia iQs is a Software Audio Console

- Pre-installed on a Telos Alliance AE-1000 application engine
  or
- Install as a Docker software container on your own PC/Server hardware.
- Supports Livewire or AES67 source audio.
- Same I/O specs and functionality as Axia iQ-series consoles

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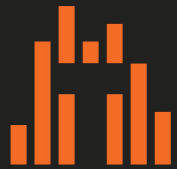
What is VX?

- World's first VoIP system for live production
- Designed for broadcasters
- Multi-line, multi-control room
- Now multi-facility
- Unprecedented control and monitoring
- Produces the best-sounding phone calls
- Supports AoIP standards

☎️ **1523** systems

📅 **36** years experience

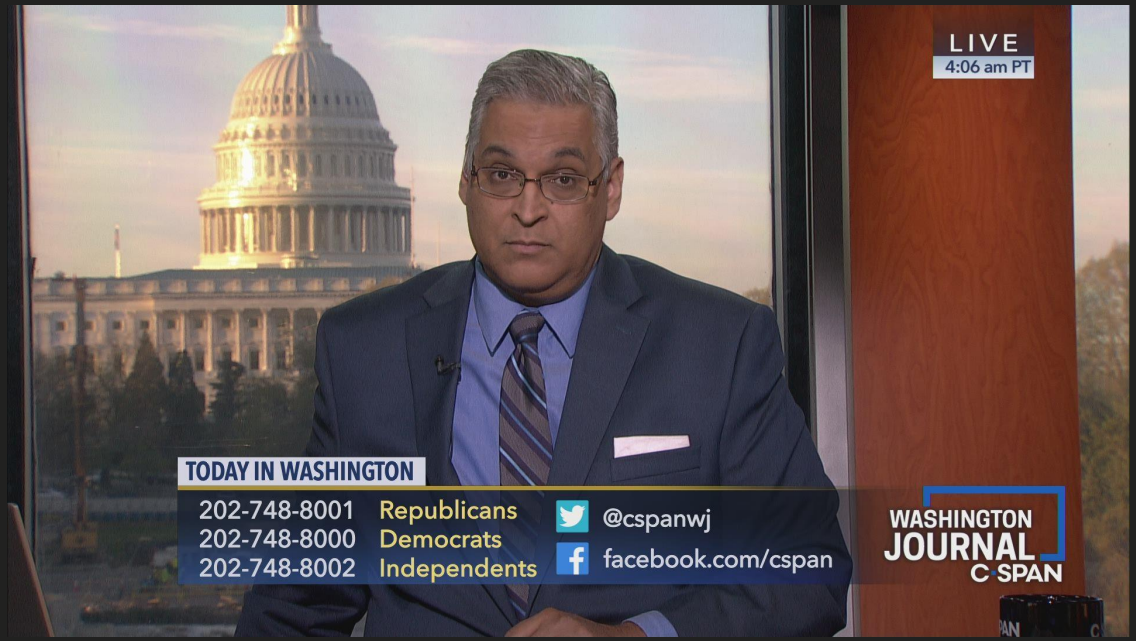
🏆 **4** awards won



What is VX?

- Tailor-made workflow
  - VSets
  - Software
  - Axia console modules
  - Pathfinder Core PRO

Telos Vset
IFB 1
IFB 2
IFB 3
Warm


LIVE
4:06 am PT
TODAY IN WASHINGTON
202-748-8001 Republicans
202-748-8000 Democrats
202-748-8002 Independents
@cspanwj
facebook.com/cspan
WASHINGTON JOURNAL
C-SPAN

STRAHAN SARA & KEKE
STRAHAN SARA & KEKE
STRAHA
GMA3
STRAHAN
SARA &
KEKE

abc 7
EYEWITNESS NEWS
HTS AT 4, 5, 6, AND 11PM AND WEEKDAY
ESPN
msey calls in sick amid trade demand
ESPN

A-224383
EXCLUSIVE
Josie Maran Light Bronze Whipped Argan Illuminizing Body Butter, 8 oz.
Mfr's Suggested Retail $40.00
QVC Price $32.00
S&H $5.97
Testimonial Line: 800-395-1601
Text Item# to 78246 (QVCGO)
Message and data rates may apply
JOSIE MARAN
ARGAN OIL COSMETICS
QVCHD

QVC

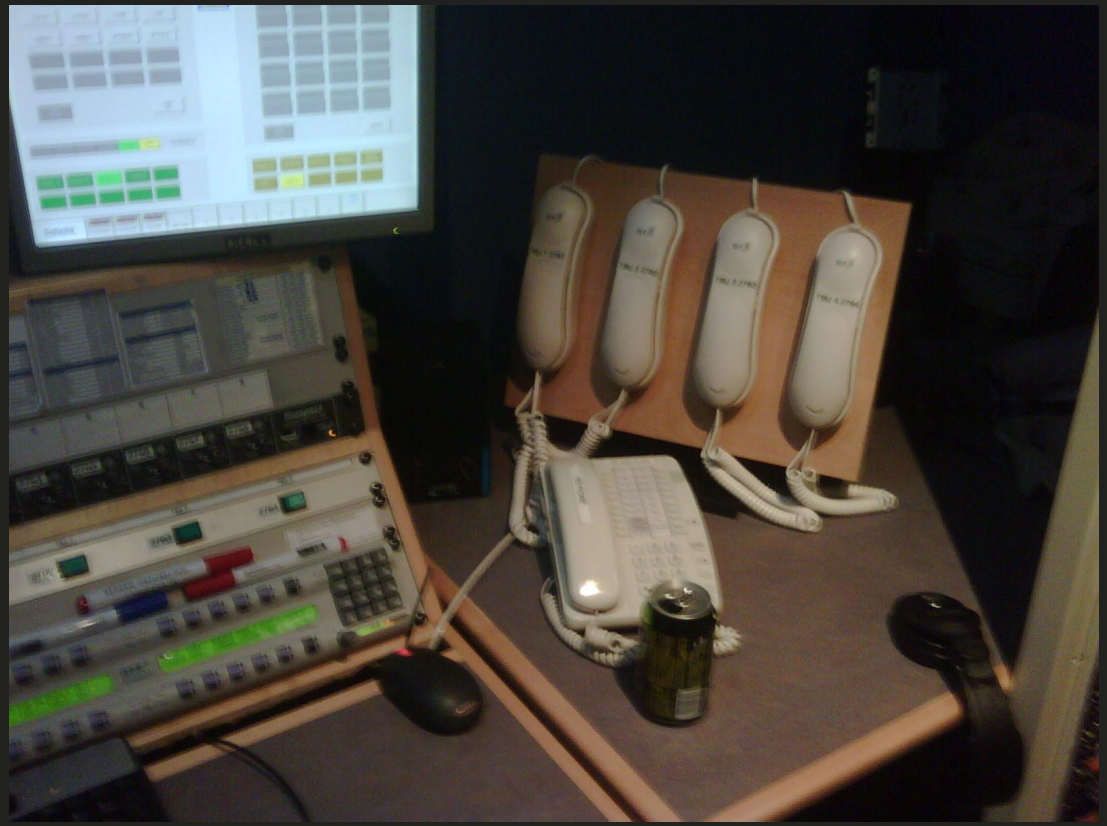
Production POD 2
00:00:00
ABC White House

WHITE HOUSE COMMUNICATIONS AGENCY
MASTER- CONTROL
BROADCAST FACILITY

The current way

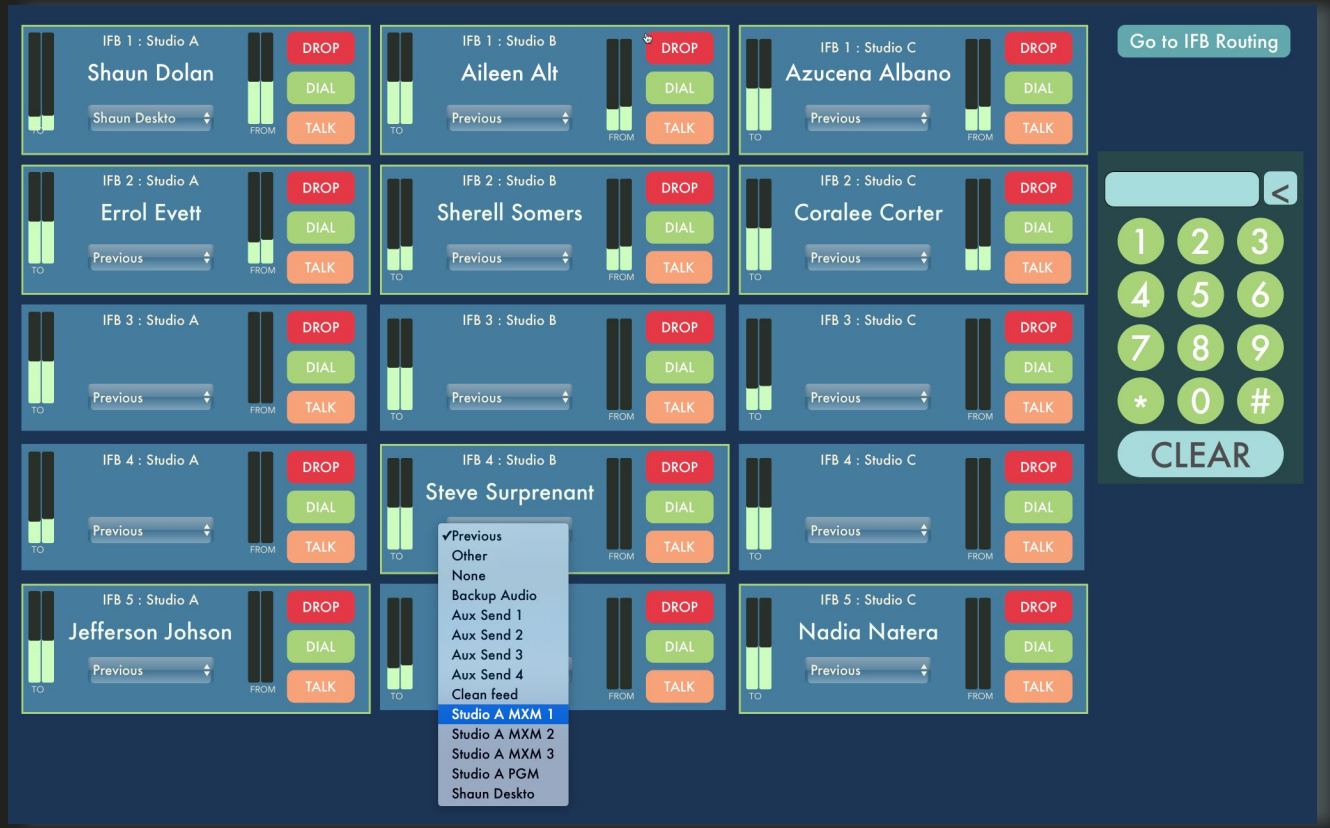
The current way

The current way

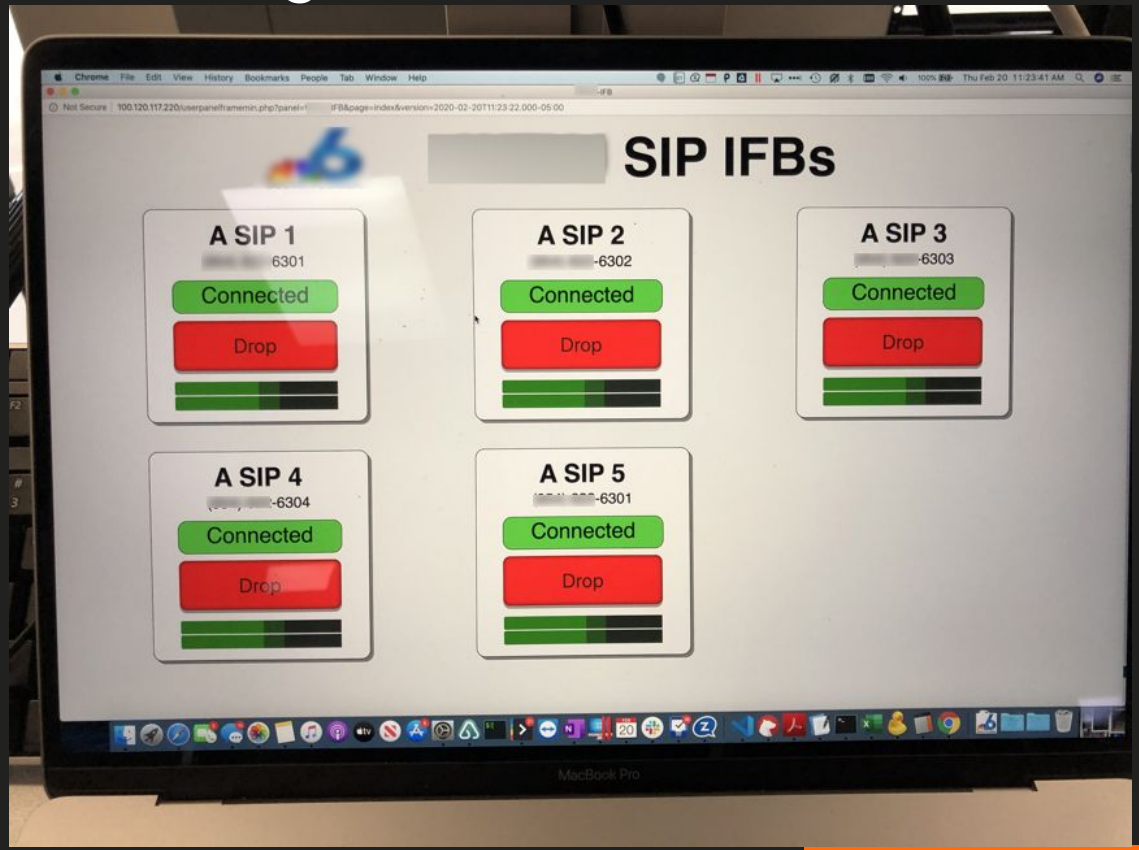


The modern way

The modern way



The modern way

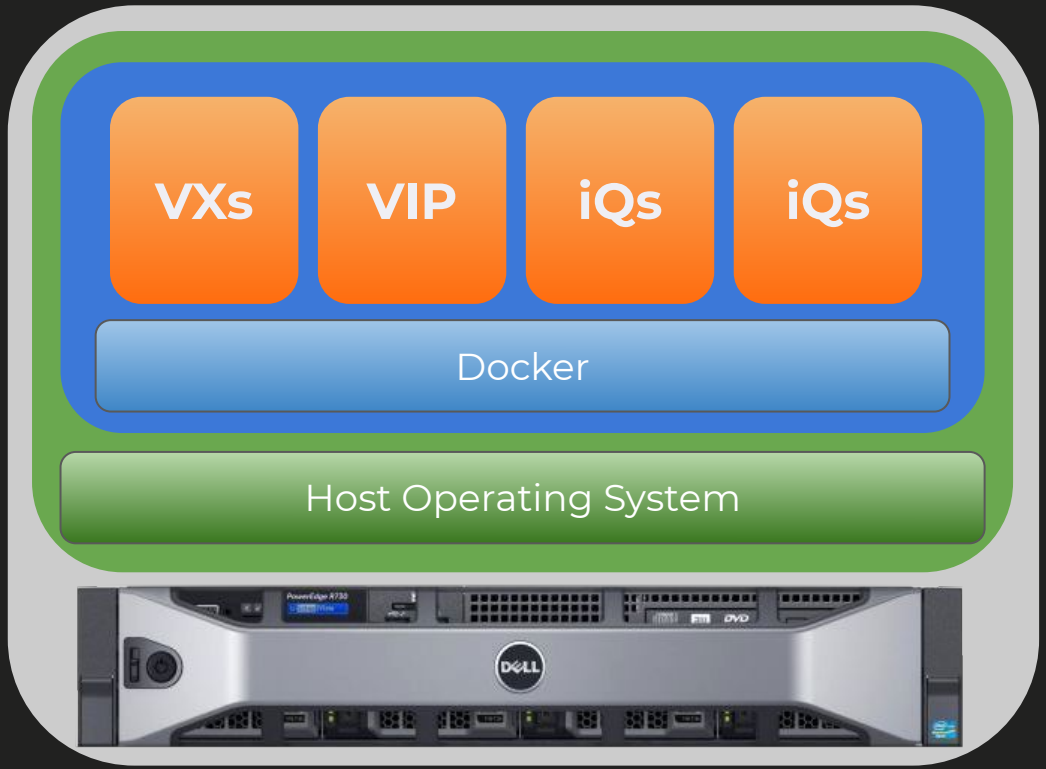


VX ENTERPRISE

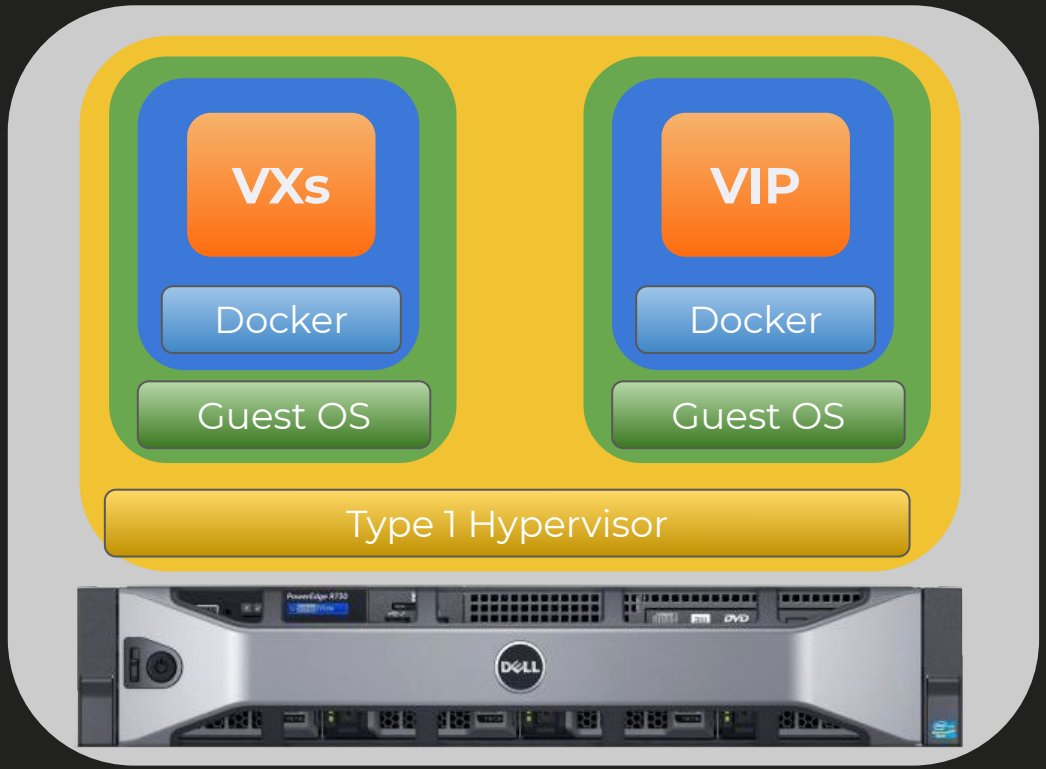
2018

Telos VXs
Telos Alliance
System
Main
SIP
Studios
Shows
Call Processing
Tones
Information
Licenses
Users
Backup/Restore
Logout
Home / General Configuration
General Configuration
System Control
Restart VXs
Network Interface
QOS
LWCP Password
New password
Save
VXs
2021

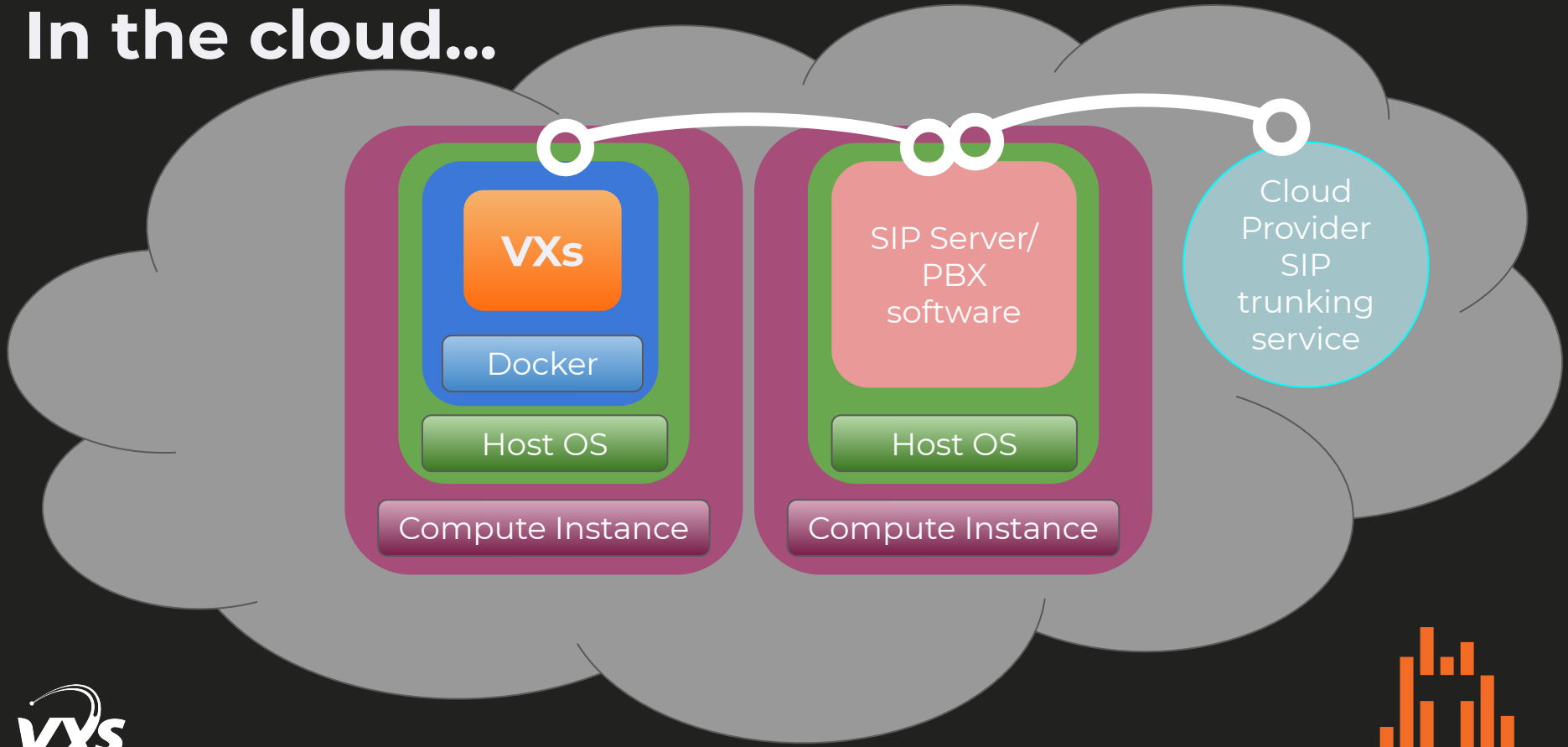
VXs as Containerized Software



Adding virtualization...



In the cloud...


VXs
Docker
Host OS
Compute Instance
SIP Server/
PBX
software
Host OS
Compute Instance
Cloud
Provider
SIP
trunking
service

How do we deploy VXs?

How do I build a VXs system?

1. Choose your features

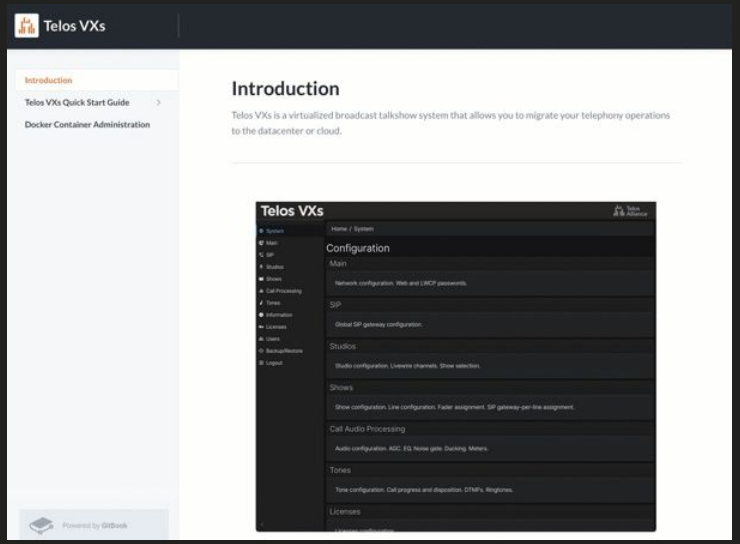
- Channels
- Lines
- Acoustic Echo Canceller

2. Choose your purchase method

- **Subscription**
  - TelosCare™ PLUS included
- **Buyout**
  - TelosCare™ PLUS purchased separately

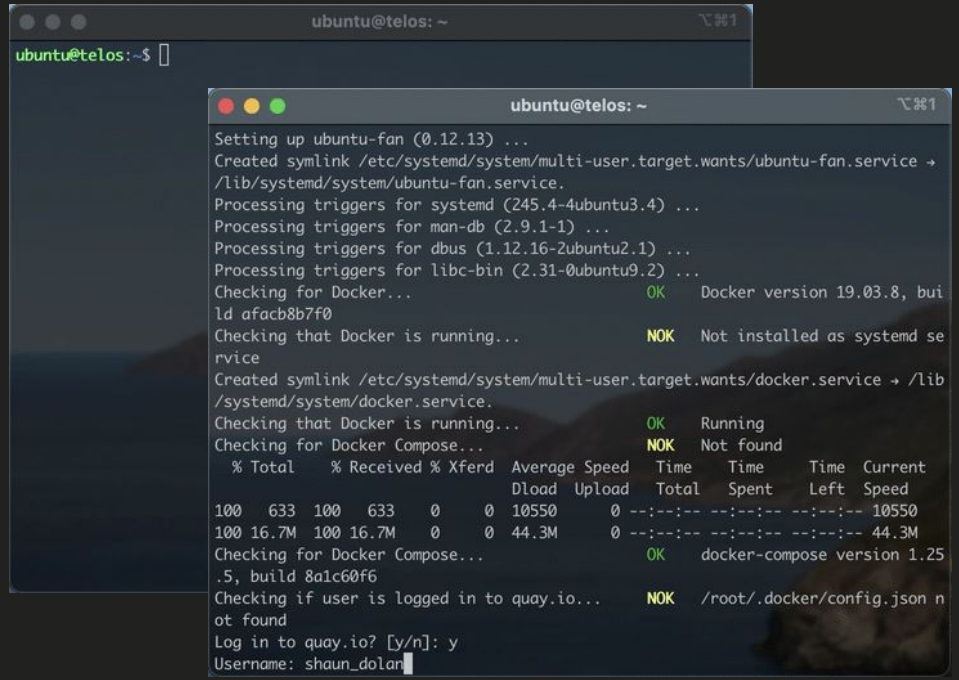
What’s the installation process like?

1. Receive demo license and review documentation



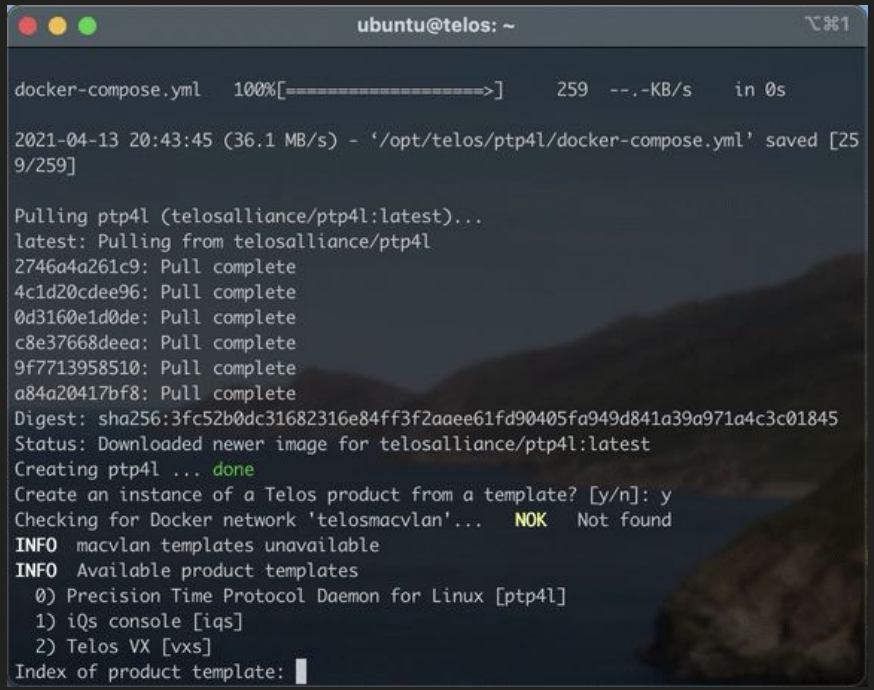
What's the installation process like?

2. Run setup script



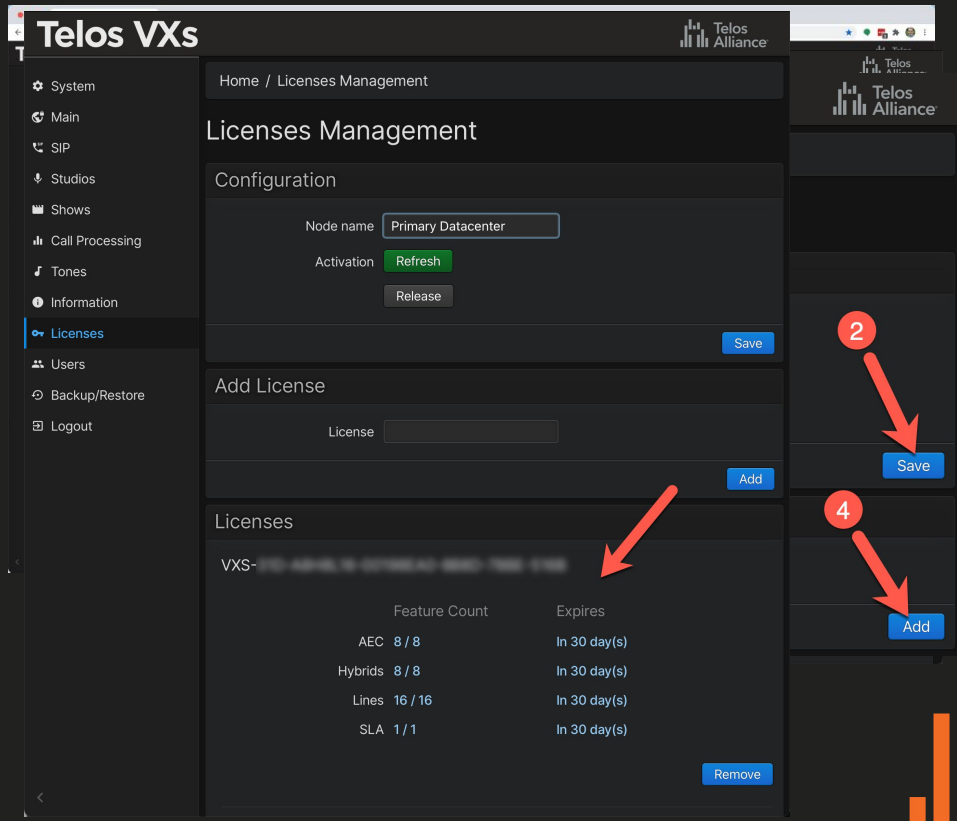
What's the installation process like?

3. Install VXs container



What's the installation process like?

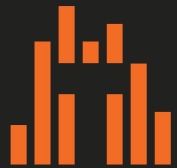
4. Activate demo license



Key takeaways

Telos VXs is a virtualized broadcast VoIP system

- Broadcast industry is changing
- Virtualization lets us adapt
  - Centralization
  - Modern control and monitoring
- Delivered as a Docker-compatible container

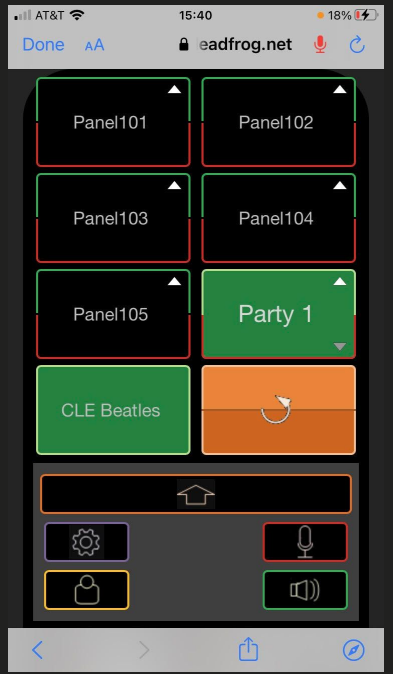


Key takeaways

Telos VXs is a virtualized broadcast VoIP system

- Deployment: on-prem, datacenter, cloud
- Choose your features:
  - **Channels**
  - **Lines**
  - **Acoustic Echo Canceller**
- Choose your purchase method:
  - **Subscription**
  - **Buyout**

Virtualized Intercom



Matrix-Less Intercom
A Different Approach

Telos Alliance®

NO COSTLY

CENTRAL MATRIX

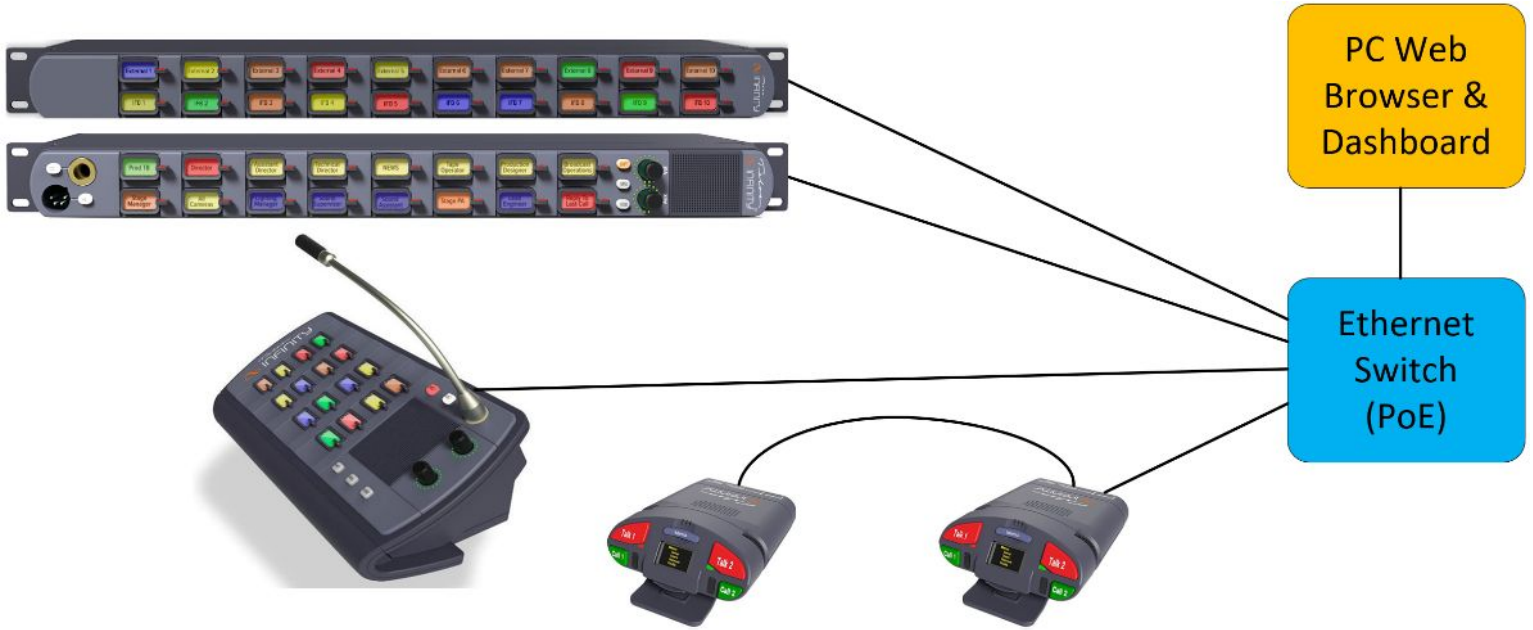
Telos Alliance®

Telos Infinity® IP Intercom

The AoIP solution that changes everything.

- Voice communication and contribution audio on a single IT backbone
- Matrix-free design allows for infinite scalability
- Livewire+™ AES67 ensures seamless interoperability
- Hardware includes BP-2 & BP-4 Dual/Quad Channel Beltpacks, MP-16 1RU Master Panel, MXP-20 Expansion Panel, and DS-16 Master Desktop Station
- ‘Base’ Panel versions for lower cost systems
- Telos Infinity Dashboard software provides intuitive configuration and management
- Infinity Link VoIP for remote system deployment over WAN

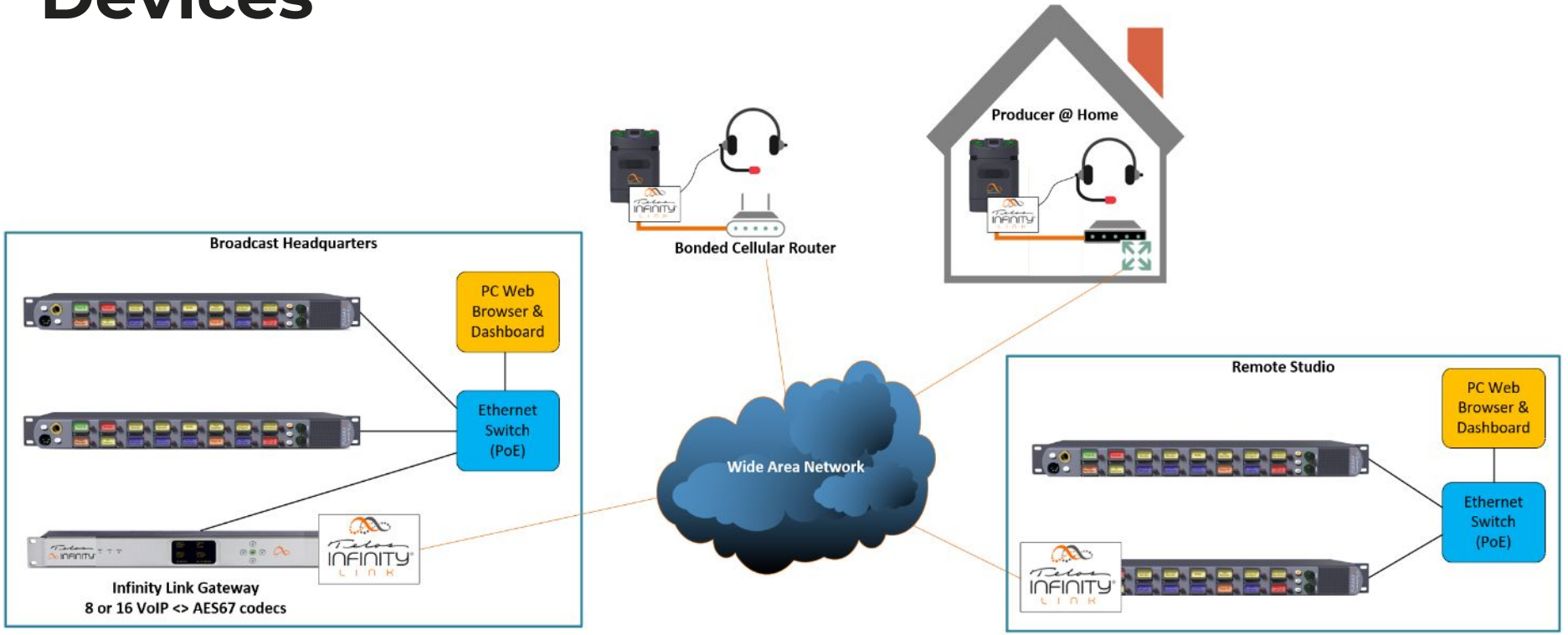
Telos Infinity IP Intercom Basic Connectivity



Infinity Link OPUS VoIP: Gateway 8 / 16
Infinity Link Device 2 / 4 / 8 VoIP Licenses

Infinity Link Gateway and Devices

The Product Range



Telos INFINITY® | VIP

Virtual Intercom Platform

Matrix-Less Cloud Communications

Telos Alliance®

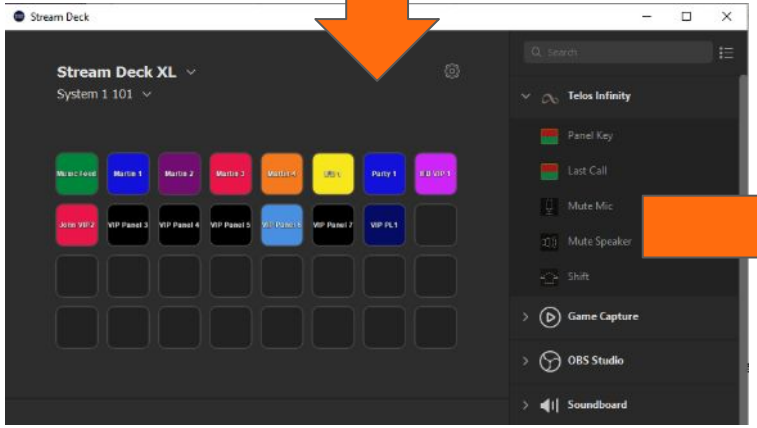
What is Infinity VIP ?

A Cloud-Based Intercom Platform: Delivering a ‘soft’ version of Telos Infinity IP Intercom to any HTML5 compatible device with onboard audio

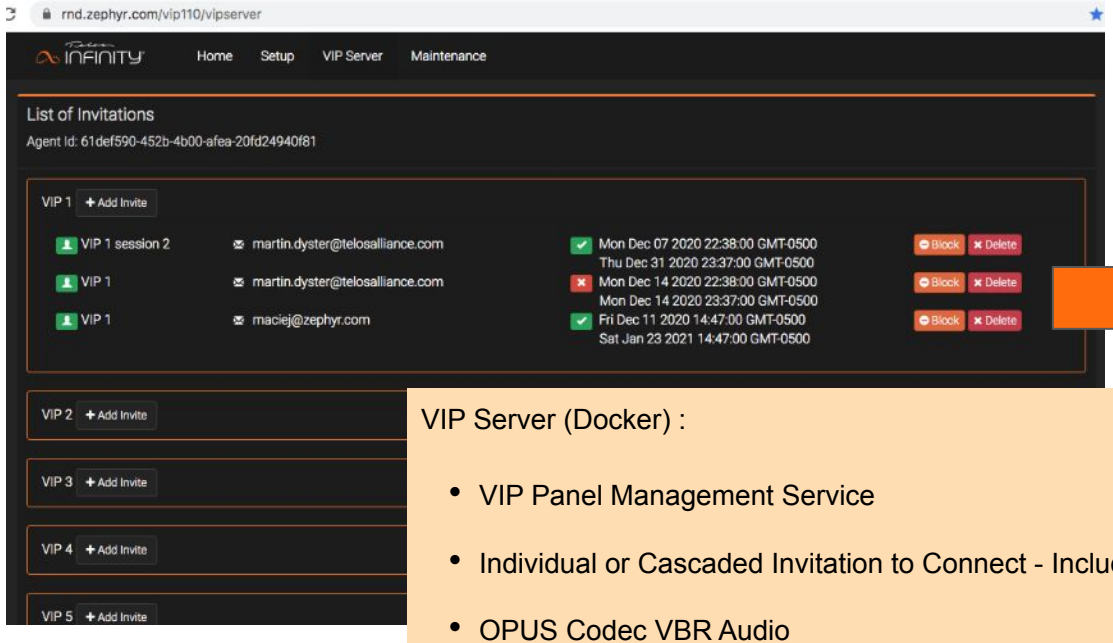
- Individual virtual ‘panels’ running on a Cloud server
- Virtualized Dashboard Config and Management Software
- Virtualized Link VoIP Codec for In Cloud and On Prem 3rd Party Connects
- Authentication, Licensing, Server Management, Up-Time Metrics
- Devices accessed via HTML5 browser
- WebRTC, Web Audio & OPUS support

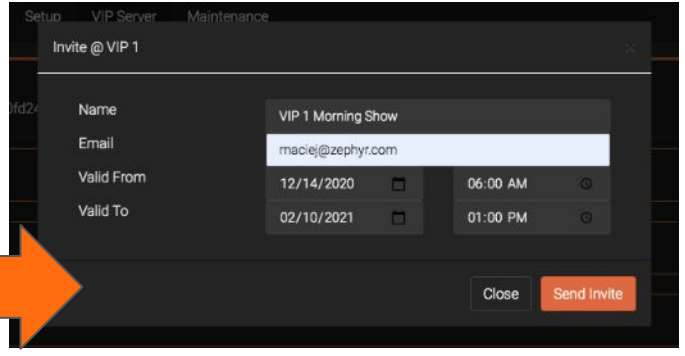
Telos Infinity VIP

Elgato Stream Deck Plugin



VIP Server Elements: Infinity Invitations





VIP Server (Docker) :

- VIP Panel Management Service
- Individual or Cascaded Invitation to Connect - Including WebRTC signaling
- OPUS Codec VBR Audio
- SHA-256 Encryption (default)
- Remote Admin - ‘Block’ ‘Delete’ ‘Edit’

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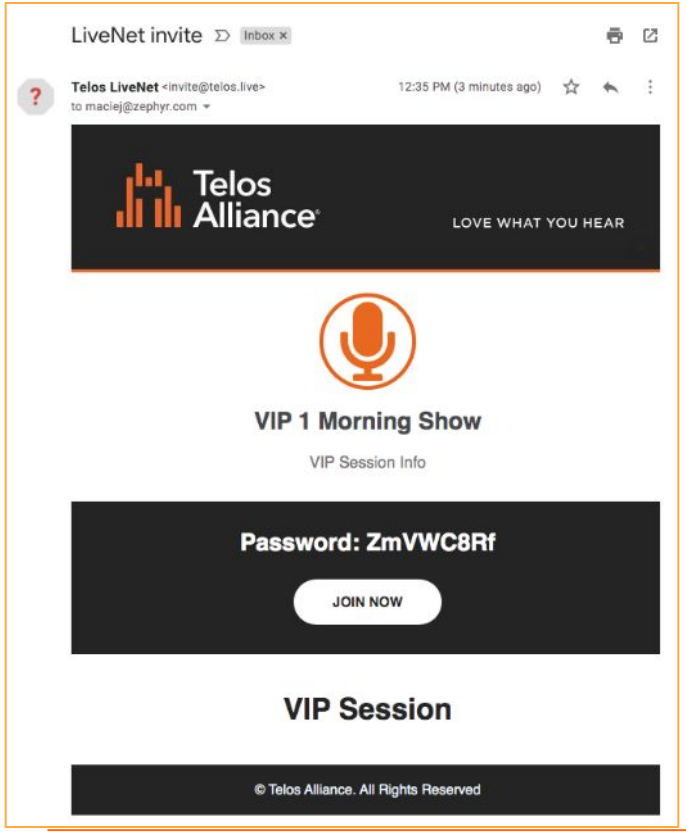
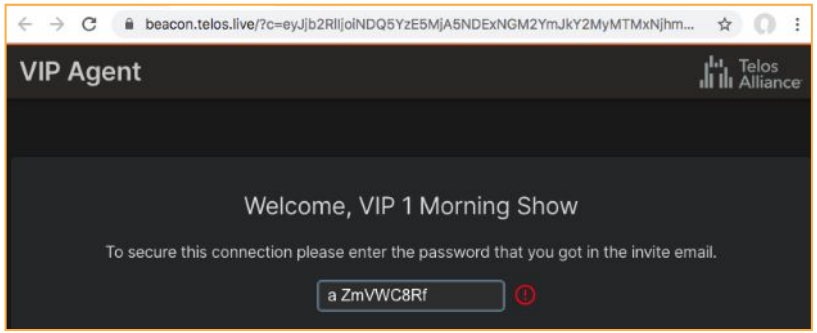
VIP Server Elements: Invitation email





Telos Alliance

Telos INFINITY® | VIP

Deployment Options:
Most Common Use Cases

Matrix-Less Cloud Communications

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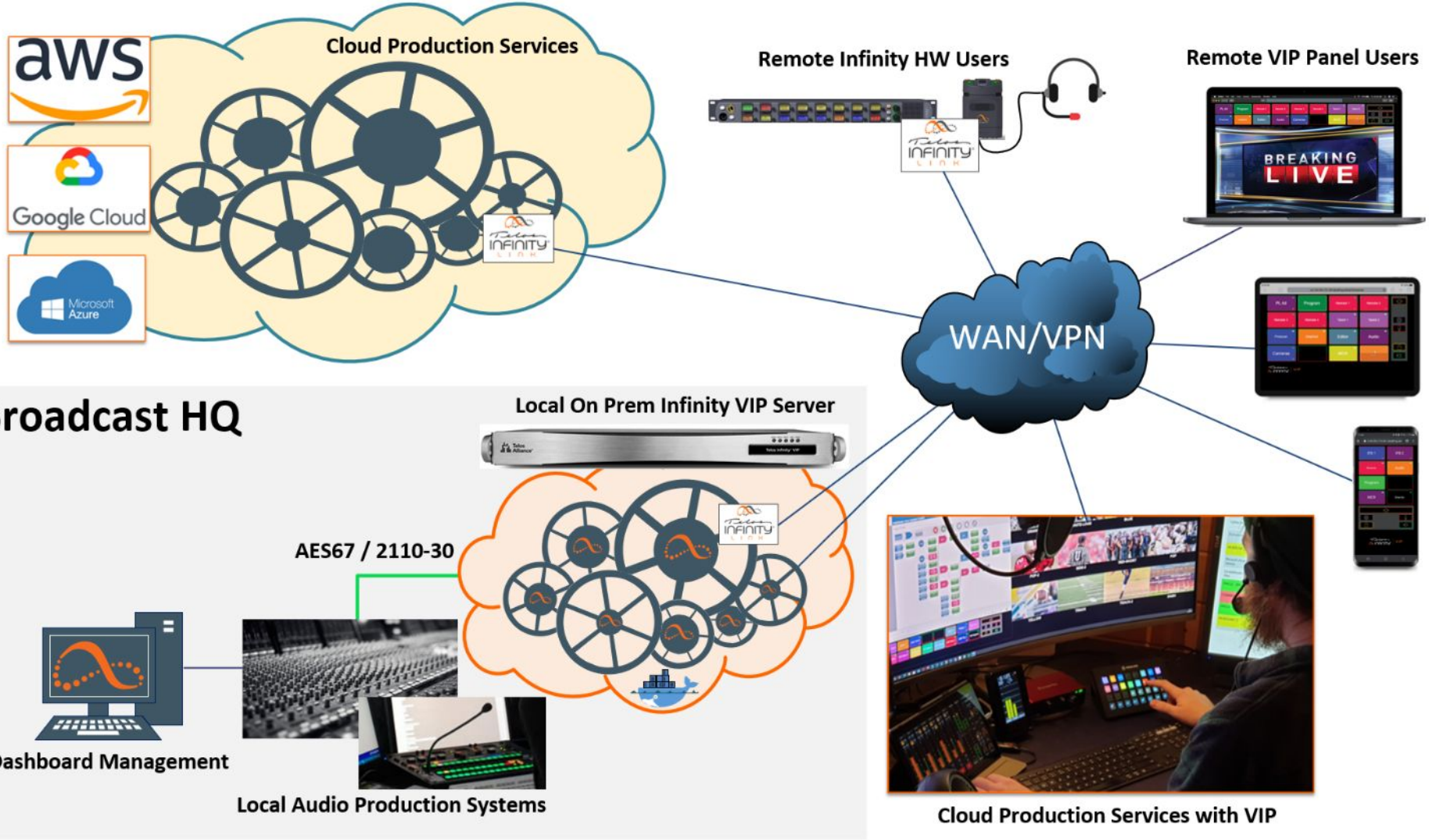

Cloud Production Services
aws
Google Cloud
Microsoft Azure
Remote Infinity HW Users
Remote VIP Panel Users
BREAKING LIVE
WAN/VPN
Broadcast HQ
Local On Prem Infinity VIP Server
AES67 / 2110-30
Dashboard Management
Local Audio Production Systems
Cloud Production Services with VIP

Hybrid Model: HQ + Venue + Remote Ops

Telos Infinity VIP Cloud Server

WAN/VPN

Venue VIP Comms

Venue Hardware Comms

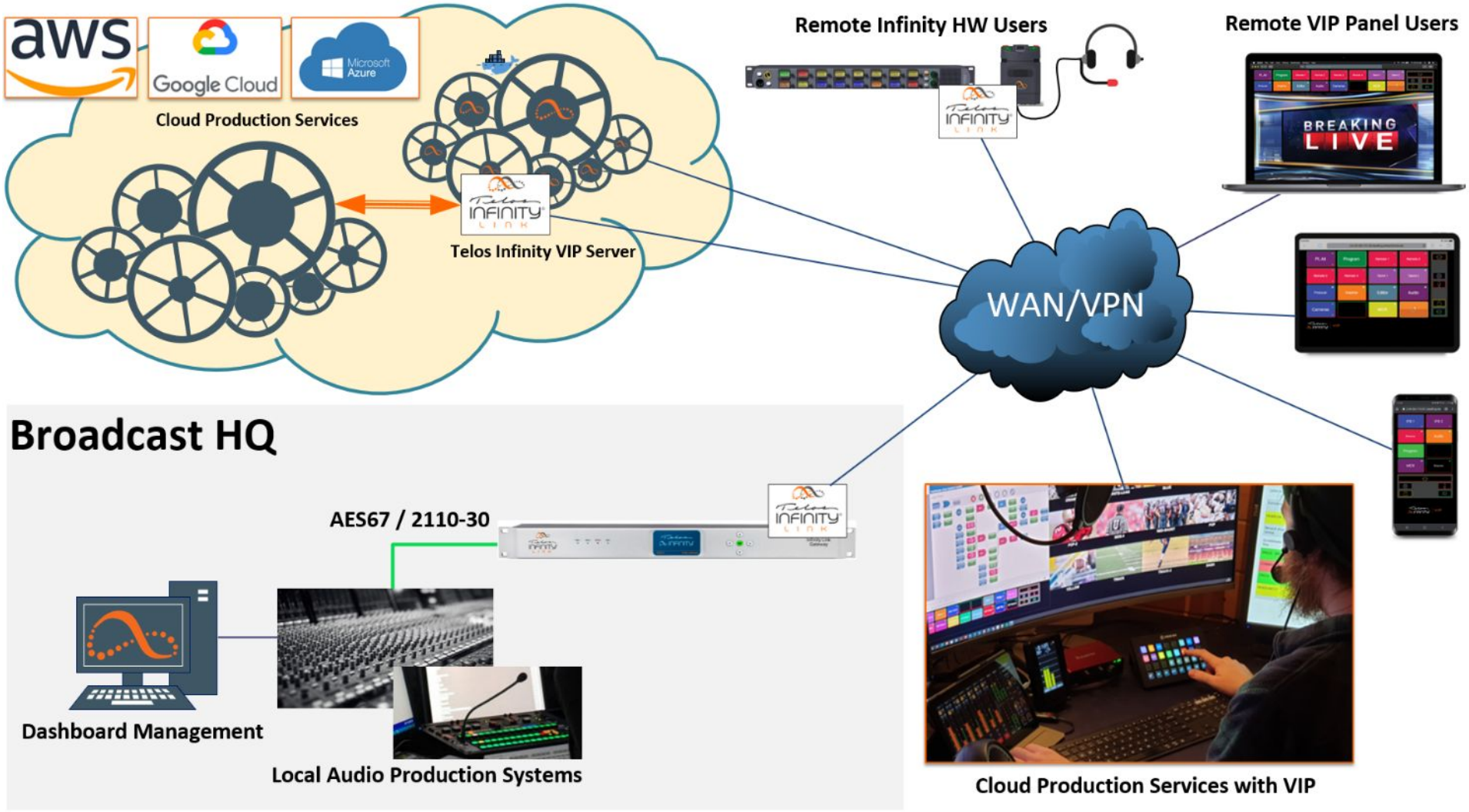
Broadcast HQ

AES67 / 2110-30

Dashboard Management

Local Audio and Comms Systems

Remote Production Team w/VIP


aws
Google Cloud
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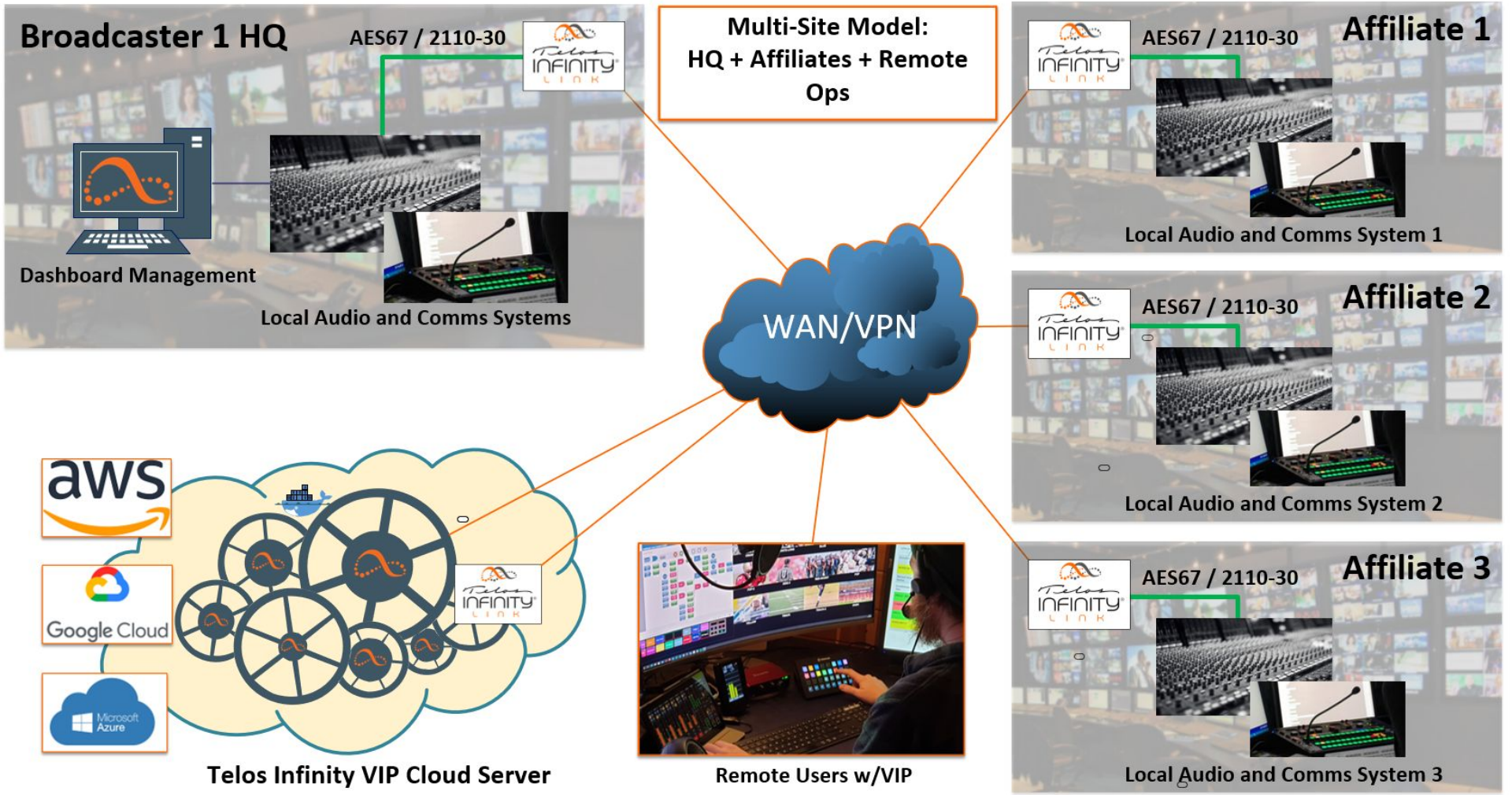
Broadcaster 1 HQ
AES67 / 2110-30
Dashboard Management
Local Audio and Comms Systems
Multi-Site Model:
HQ + Affiliates + Remote Ops
WAN/VPN
Affiliate 1
AES67 / 2110-30
Local Audio and Comms System 1
Affiliate 2
AES67 / 2110-30
Local Audio and Comms System 2
Affiliate 3
AES67 / 2110-30
Local Audio and Comms System 3
aws
Google Cloud
Microsoft Azure
Telos Infinity VIP Cloud Server
Remote Users w/VIP

Broadcast Industry Adoption

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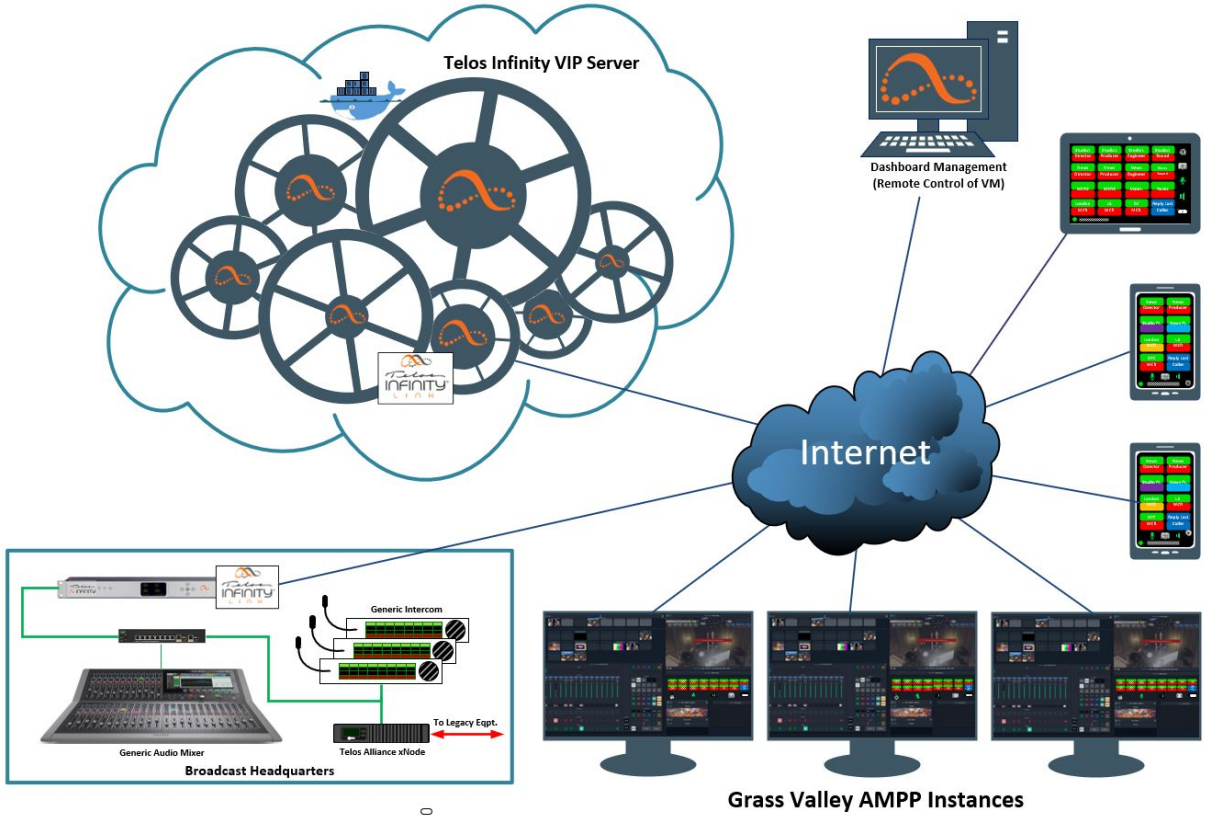
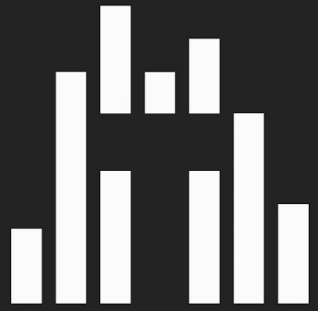
Grass Valley AMPP Integration

Grass Valley AMPP Integration





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