

Reinventing Intercom with SMPTE ST2110-30

Martin Dyster

VP Business Development
& Project Director - Telos
Infinity IP Intercom





A SHORT HISTORY LESSON

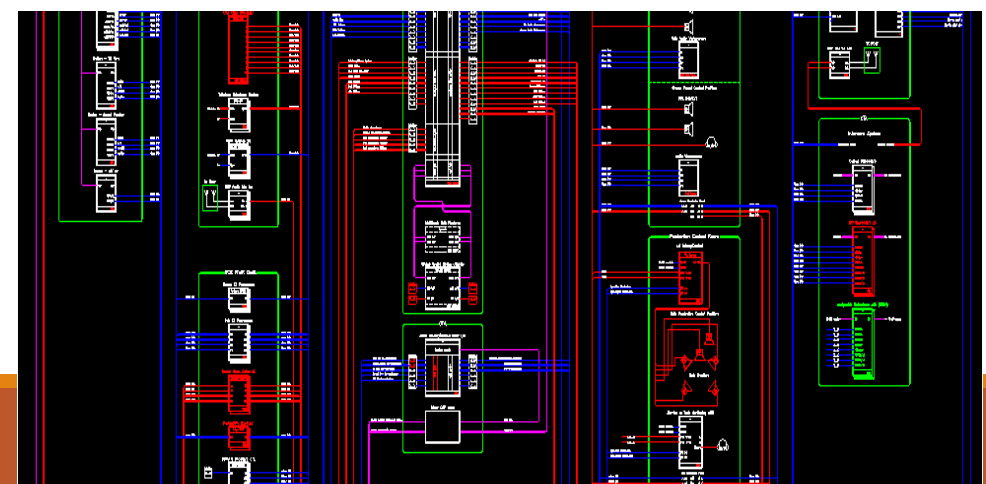
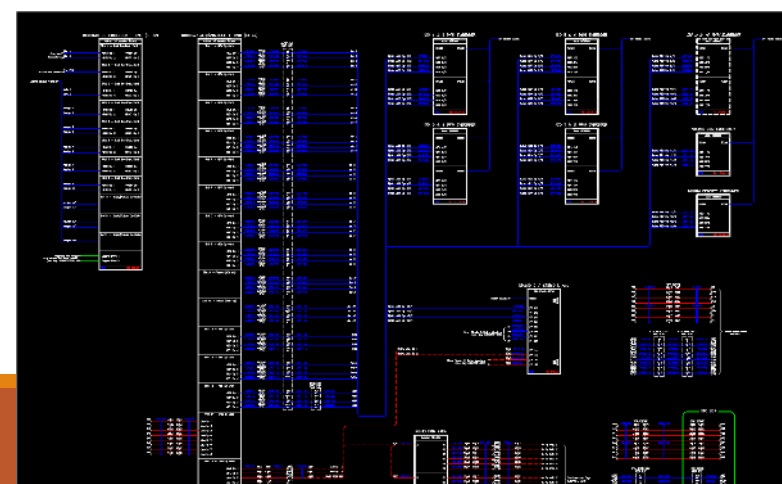
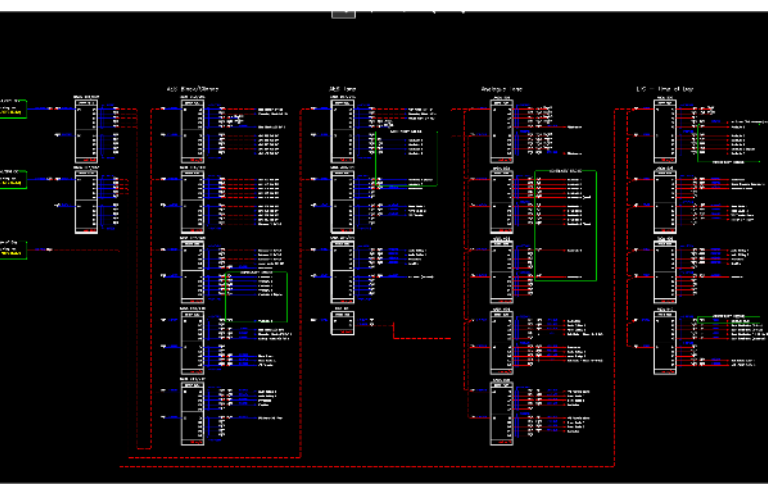
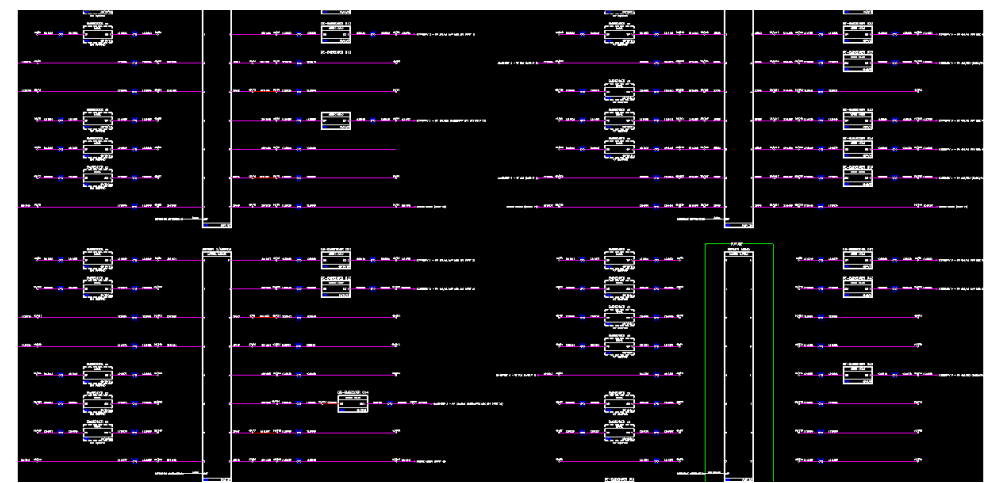
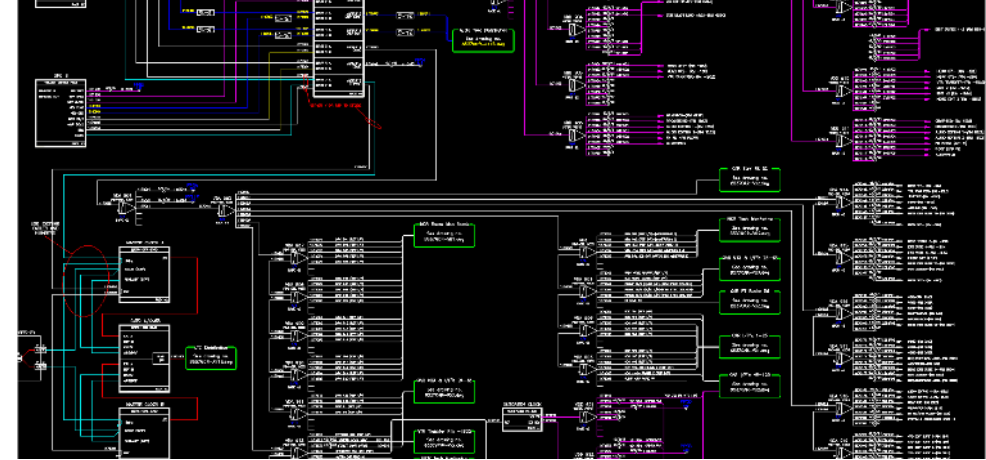


**The Year 2003
System Design Before
Audio over IP!**

Typical broadcast system install: 2003/4

- RTP in Lisbon, new HQ went live April 2004 in time for Euro Soccer Championships
- AES-3, Analog and SDI audio throughout
- In excess of 10,000 individual audio pairs.
- Everything through patch bays
- Hundreds of miles of cable
- Tens of thousands of hand soldered, crimped or punched connections







Audio over IP: A Revolution 2003 to Present Day

2003: The Telos Alliance (Axia) Introduces Livewire, The First AoIP Protocol

2004: First AoIP Broadcast Studio Created: Auburn University's WEGL-FM 91.1 in Alabama

2006: Audinate Introduces Dante IP Audio Protocol into Pro Audio Market

2008: Wheatstone AoIP Protocol Comes to Market

2010: ALC Networks Introduces Ravenna

2010: The Audio Engineering Society Forms the x192 Working Group

2013: The AES67 Standard Is Ratified

2014: Media Networking Alliance Launches

2015: Alliance for IP Media Solutions Formed

2017: SMPTE publishes SMPTE ST 2110, adapting AES67 as the audio format 2110-30

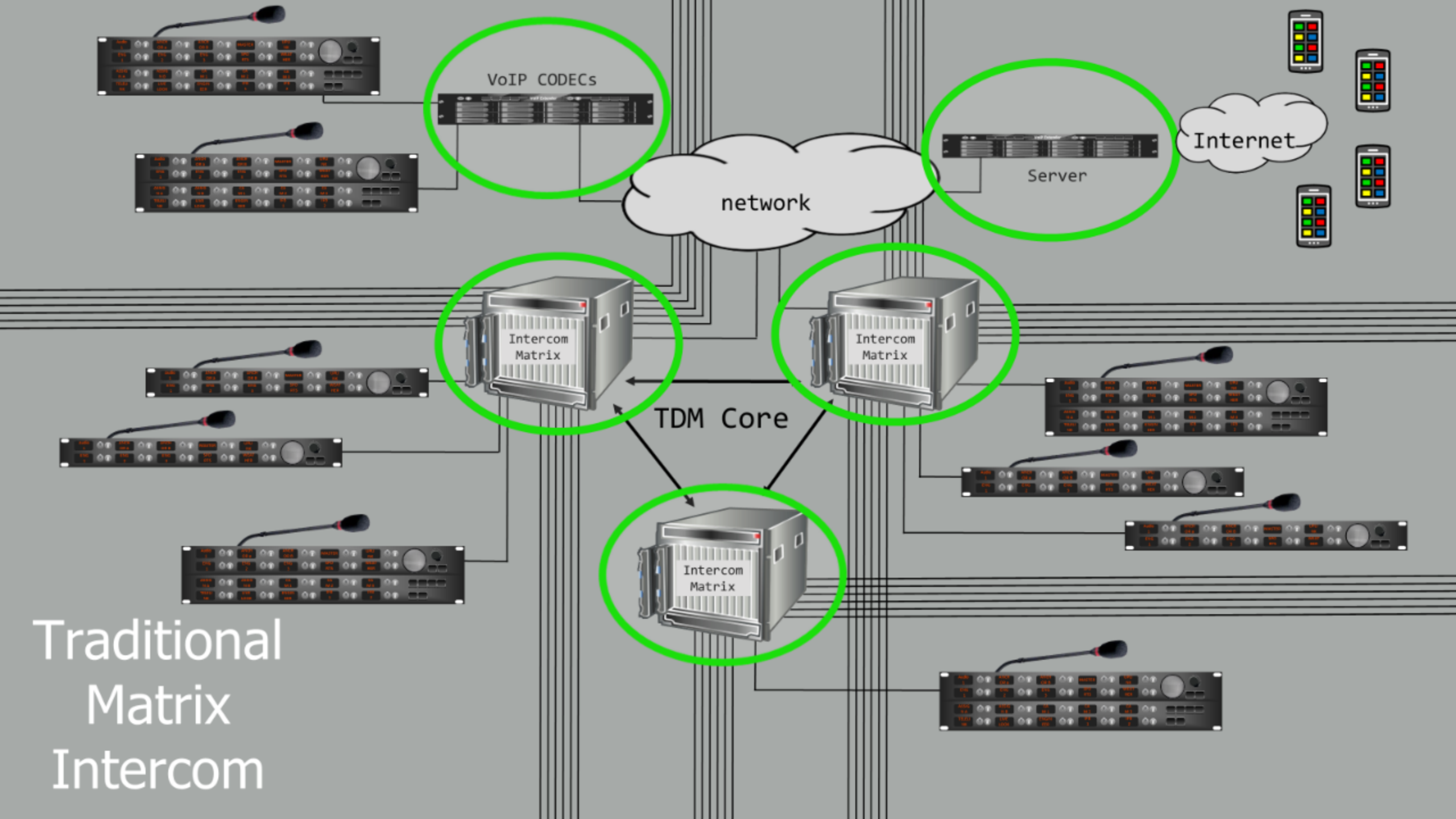
Audio over IP: The Payoff

- Standards Based – AoIP uses Layer 3 switch fabric, PTP Clock, RTP and SDP
- Switched Multicast removes the need for DAs, Patch Bays, Centralised Routers
- Reduces cabling, saves rack space, less complex design and associated costs
- Uncompromised audio quality - 24bit/48Khz low latency
- Digitized signal path at source
- No complex House-Sync distribution system
- Distributed Architecture = Fewer single points of failure



INTERCOM

LIFE AS WE KNOW IT TODAY



Traditional
Matrix
Intercom

Matrix Intercom, a practical solution?

Crosspoint Switching

Partylines, IFBs and Groups all require mixing

Matrices can store configurations

Gain controllable I/O and crosspoints

Signal detection and monitoring is easy

Matrices are resilient – Dual Power/Dual CPU

Wide range of connectivity options

A known commodity

When Matrix Intercom is not such a practical solution ...

Lack of flexibility – size limited by port count

Channel handling limited by buss structure

Difficult (and expensive) to trunk multiple frames

Takes up rack space

Everything cables back to central point

AoIP connected devices also need Ethernet fabric

Single points of failure

THE CHALLENGE:

BUILD A MATRIX-LESS PURE
IP INTERCOM

An IP Intercom from scratch: The Constitution

- Distributed DSP: No Matrix or equivalent Central Processing Engine
- Produce 'Familiar' Software and Hardware components
- Meet or exceed expected Matrix Intercom capability
- Use standards-based protocols natively – RTP / AES67 / SIP / VoIP
- A native part of a SMPTE ST2110 ecosystem
- Scalable and resilient solution
- Simple for users of all skill levels
- Hide complexity 'under-the-hood'
- Look beyond the limits of what has gone before

Introducing:



INFINITY



Telos Infinity Intercom Overview

All new system

Standards based: Fully AES67 and S2110-30 compliant

Matrix-Free distributed network architecture

Fully featured hardware and software based system

'Infinitely' scalable

Lower entry and maintained cost

Seamless integration with VoIP via SIP codecs and Opus Server

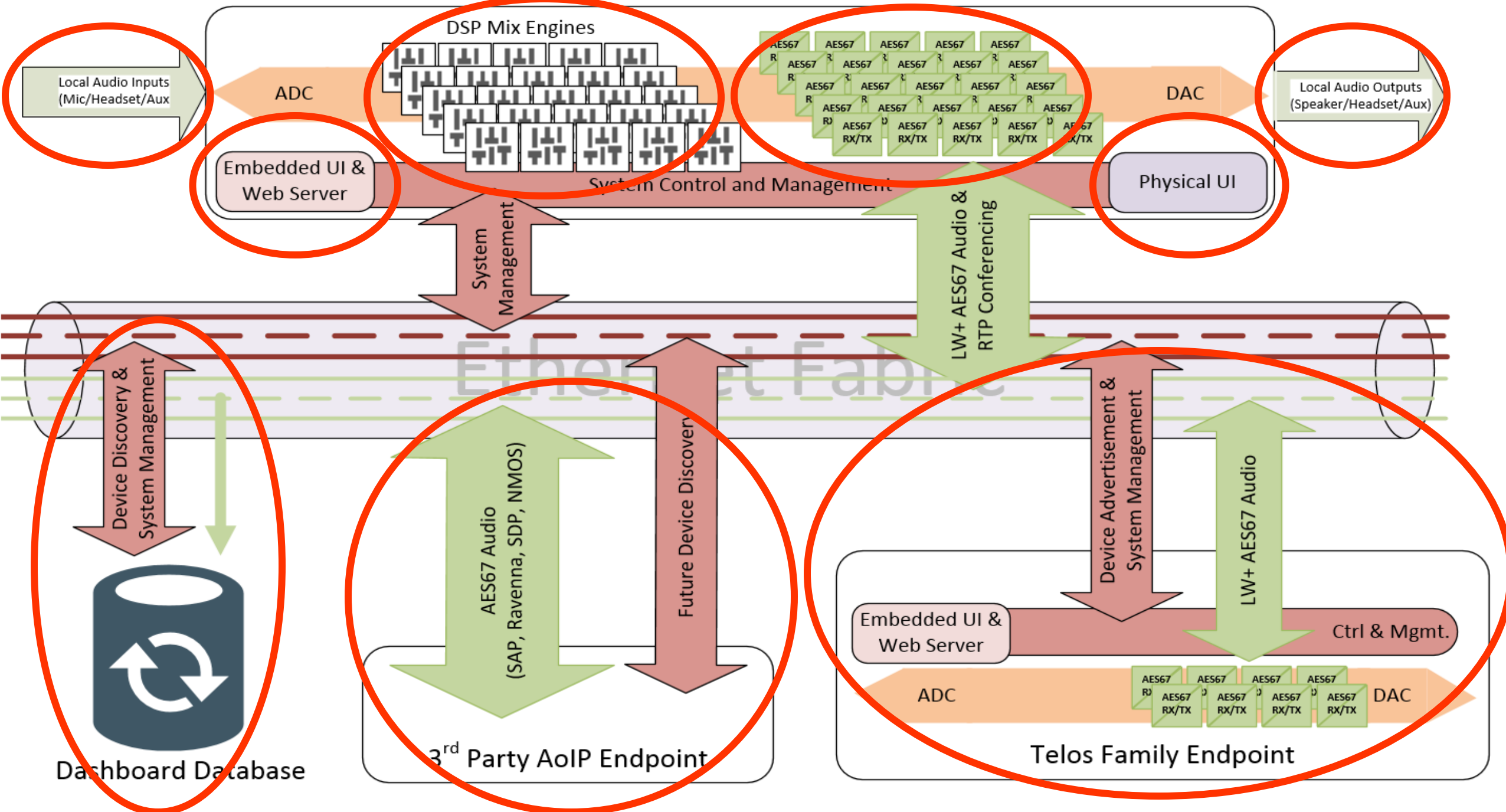
Erases the line between communication and contribution

Plug and Play

Modern and intuitive UI

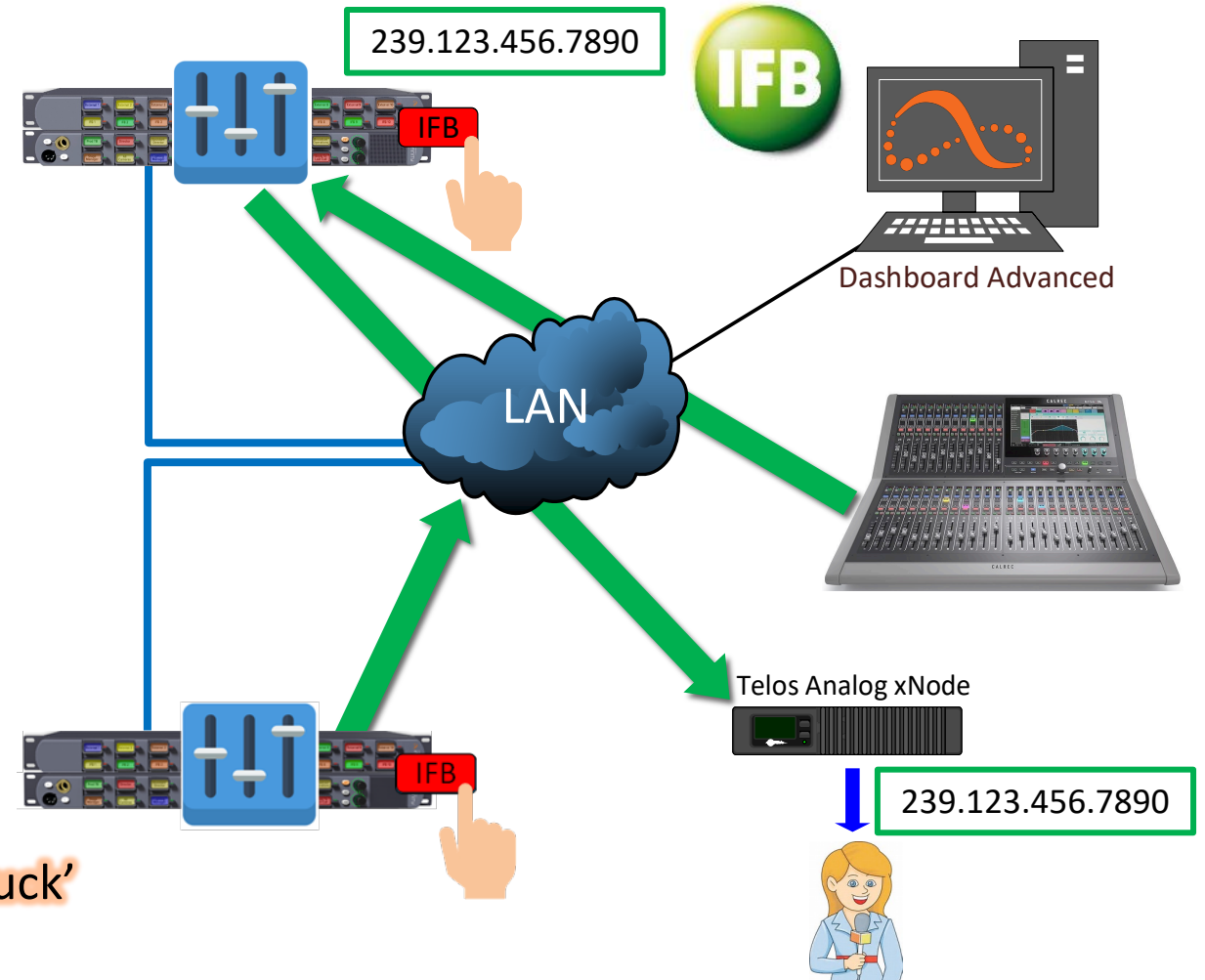


Infinity Device / Panel or Beltpack



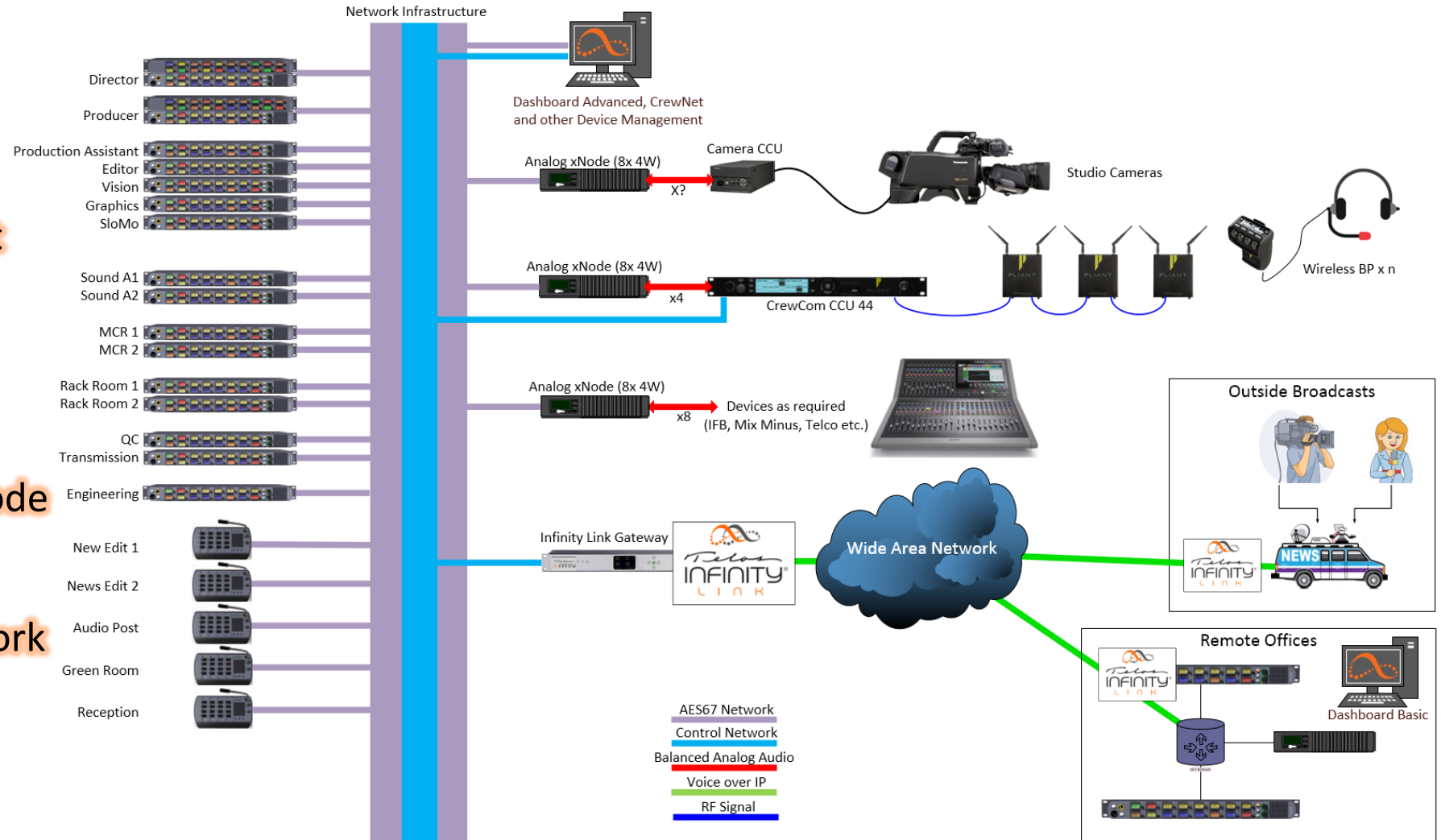
Example: What happens when I created an IFB?

1. Create an IFB using Dashboard
2. Dashboard will assign a mix resource at two locations (primary and secondary)
3. Add a source (mix minus from console)
4. Add a destination (IFB Transmitter) IFB
5. Destination will subscribe to primary MC address
6. Mix Minus is routed to primary IFB mix
7. Destination hears mix minus
8. Add IFB key to Intercom panel(s)
9. Panels can talk across IFB feed – mixer will 'duck' mix minus per configuration



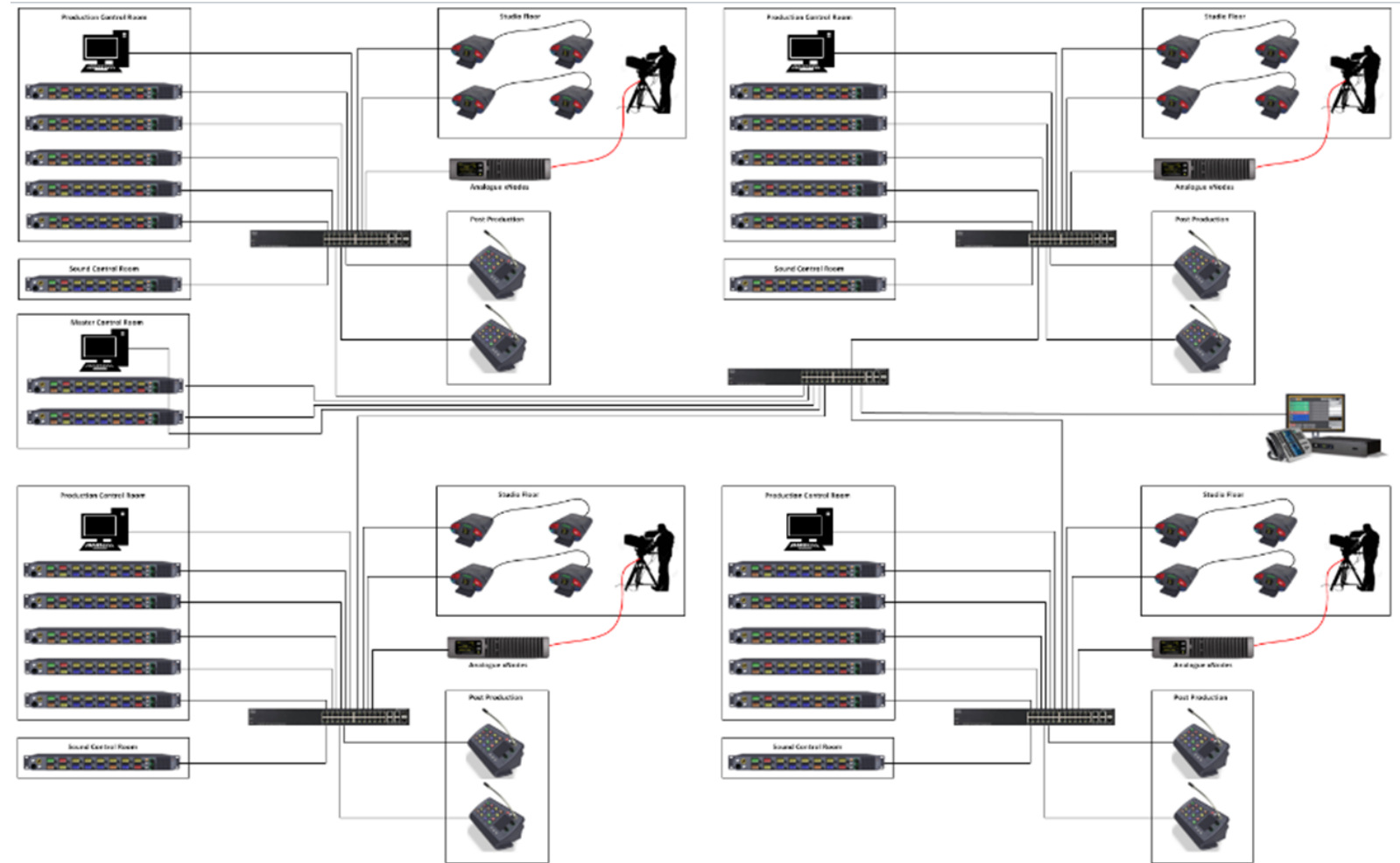
Telos Infinity - Typical Studio System

1. Telos Infinity has no Matrix, so communication between Intercom elements is via direct connection to the LAN/VLAN/WAN
2. Analog and other baseband audio is converted to IP by node devices and any ST2110-30/AES67 present on the network can connect natively without an external interface



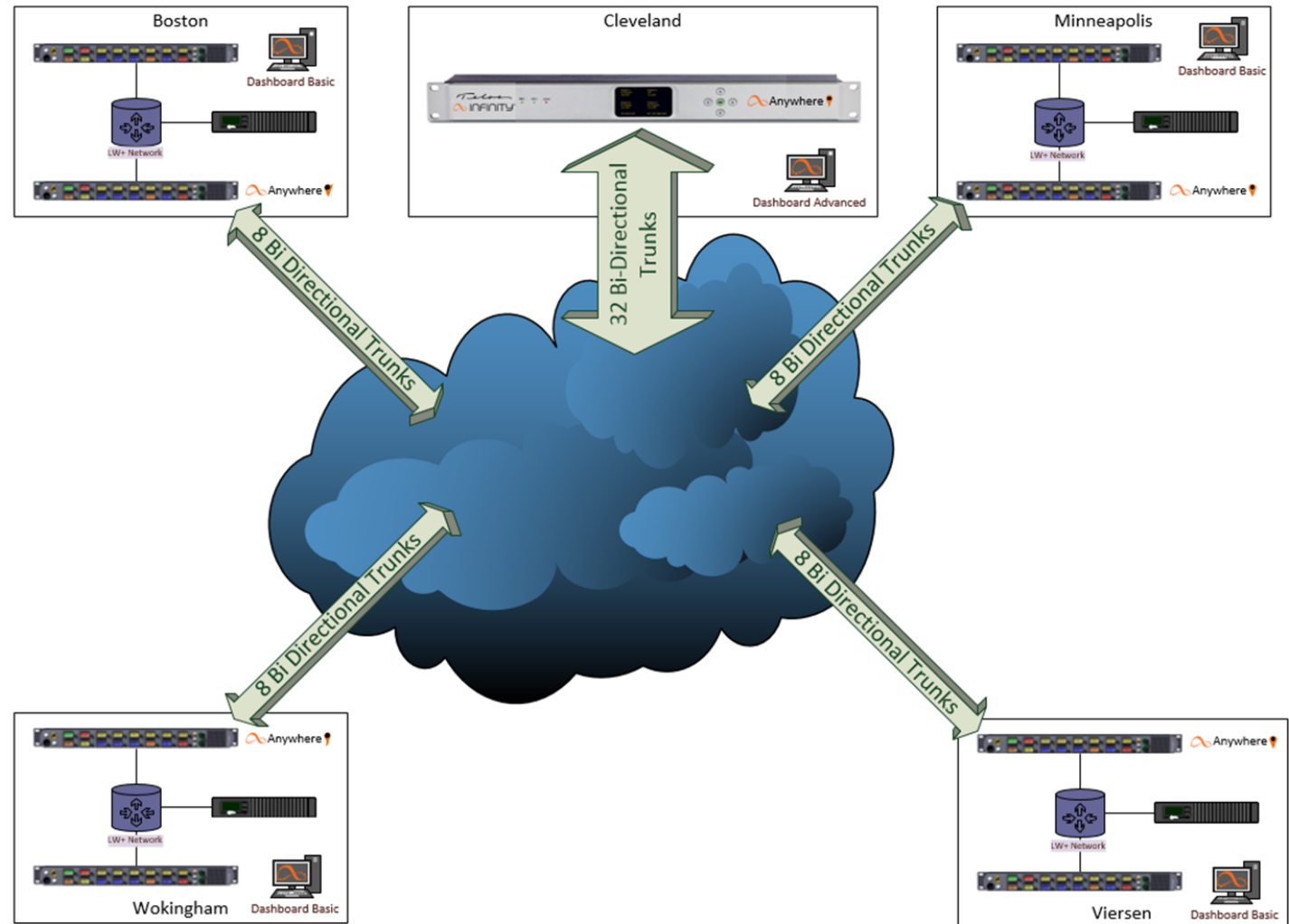
Telos Infinity - Typical Multi-Studio System

1. Example shows four similar Production Studios and Master Control connected via a common IT infrastructure.
2. Dashboard Advanced enables the users to manage their own studio configurations while the Master Control client has full administrative rights over the entire system



Telos Infinity - Typical Multi-Site System Using Link

1. Sites are connected using Telos Infinity Link Services equipped with the adaptive OPUS VoIP codec
2. Infinity Link can be hosted on a Panel, Beltpack or a dedicated Gateway
3. Dashboard manages each local client with overall administrative control assigned to one or more Master Control operations
4. VLAN will work directly on hi-speed connections without needing VoIP compression





Thank You for Listening!

Martin Dyster

The Telos Alliance

martin.dyster@telosalliance.com

+44(0)7900 584066

 INFINITY