

NFL Media New Facility at Inglewood

Patches, we don't need no stinking patches.

Alan Wollenstein, Director

NFL Media



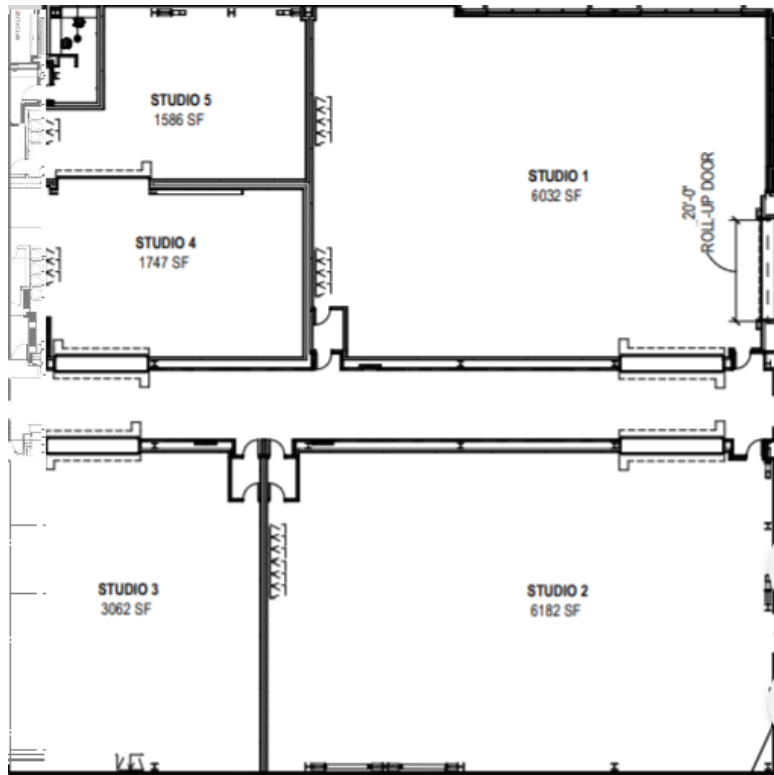


Background

NFL Media had the opportunity to build a new facility from the bottom up. As a greenfield the infrastructure uses ST-2110. This was possible due to decision for the building and standard publication converging.

- Old facility located in Culver City, Ca.
- New facility located next to SoFi Stadium in Inglewood, Ca.

Facility – Part 1



Current facility is comprised of:

- 13700x9800 (count of flows and baseband)
- (6) Studios
- (6) Production Control Rooms
- (5) Audio Control Rooms
- (1) Voice Over Booth
- (1) Newsroom set
- (1) Outdoor demo field area
- (94) edit bays (19 physical, 75 virtual)
- (42) Ingest channels
- (42) Playback channels
- (16) 10x2 Quick Turn around systems
- Connectivity to multiple location throughout the campus

Facility – Part 2

- The NFL 2021 season, which includes the Super Bowl LVI were broadcast from NFL Media next to SoFi Stadium in Inglewood, Ca.
 - Total Access
 - GameDay
 - NFL Now
 - RedZone from NFL Network
- NFL Media control rooms were used instead of trucks for most of the NFL Network programming during the Super Bowl week, including:
 - Super Bowl Halftime Show
 - Super Bowl Opening Night
 - NFL Honors



Facility – Part 3

- NFL Podcasts also produced primarily out of NFL Media.
 - Around the NFL
 - NFL Fantasy
 - Move the Sticks
- NFL Digital takes live content and other sources within NFL Media to do its encoding for VOD and streaming.

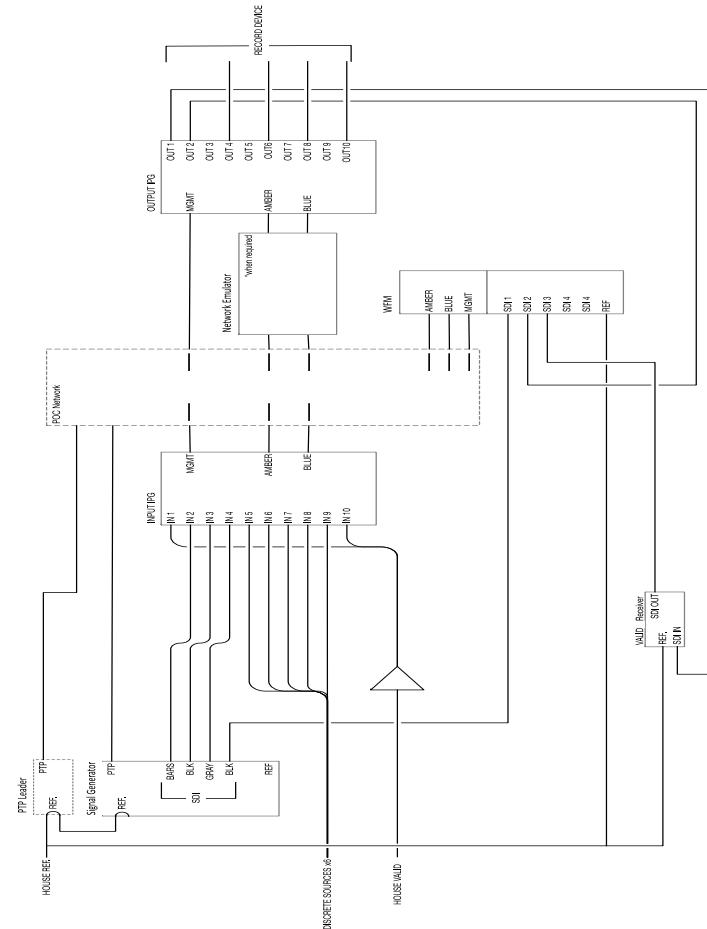


Pre-build

NFL Media setup an InterOp Lab in the Culver City facility.

- Testing
- Learn
- Control environment
- No pressure
- No distractions

This provided a primer to create a foundation that was familiar to the operations and production crew that was used to build new workflows.



Build Time - Before Inglewood

Concerns

- New Facility been built
- New Technology
- New Workflows
- Deadline, launch date
- Pandemic

Solutions

- Temp Facility
- Setup, configure, and debug
- Implemented some workflows
- Fine tune tools for deployment
- Control of resources

Talk about pressure.



Build Time - Inglewood

Concerns

- Scale
- New workflows
 - Partially develop
 - Introducing and training operators for changes and limitations
 - New findings based on feedback.
- Ongoing resolution for findings, existing and new
 - Correctly define what needs to be fixed.
 - Will they be adopted in time.
- Pandemic



Build Time - Inglewood

- Solution

The mix of the following was the reason for a solid launch:

- InterOp Lab – Learning and testing.
- Temp facility – Configure and debugging.
- Taking a step at a time, workflow by workflow.
 - Concentrating on backbone, one room, system, etc.
- Constant communication with everyone involve.
 - Vendors
 - Manufacturers
 - Integrators
 - Operations
 - Production



Lessons – ST-2110 & NMOS

ST-2110

- Goal was to do 80% IP and 20% baseband.
- Ended with about 50-50
 - IP native products availability:
 - Not available yet.
 - Not fully functioning.
 - Not good for production.
 - End of Life.
 - Most of the baseband is for transmission.
- Reduce the need for patches, distribution amplifiers and embedders.

NMOS

- Mindful that it is an HTTP based protocol so there is some latency.
 - Used other protocols when quick cuts are needed.
- Senders are not dependent on the abovementioned.
- Some senders do need an external tool to provide their multicast addresses.



Lessons - Devices

- Need to account for unexpected effect based on use.
 - Example, sending multiple route change requests quickly accumulated in a system which would slow down and defer the swaps.
- Consider how and what can be configured.
 - Some did not have a way to adjust PTP parameters.
 - No PTP domain or only available for senders.
 - Some just limit what can be adjusted.
 - What multicast block of address it can use, for example only alter the last 2 octets.
 - Some do not have drivers to control them.
 - Senders can be treated as unmanaged sources, manually enter and update in database.
 - Receivers not in database but manually enroll sources directly on device.
 - Watch for default configurations.
 - Make sure they adjusted before linking them to the network or they will flood ports and receivers.



Lessons - Database

Track how many databases are needed. We ended up with 2:

- Broadcast control
- Tally

A high-count entry facility will make database:

- Take a prolonged time and disrupt functionality during changes.
- Take long times for devices that do an initial load.

How they communicate for sync?

- Have a common protocol.
- Account for levels and entry types.
- Additional steps to coordinate the databases.



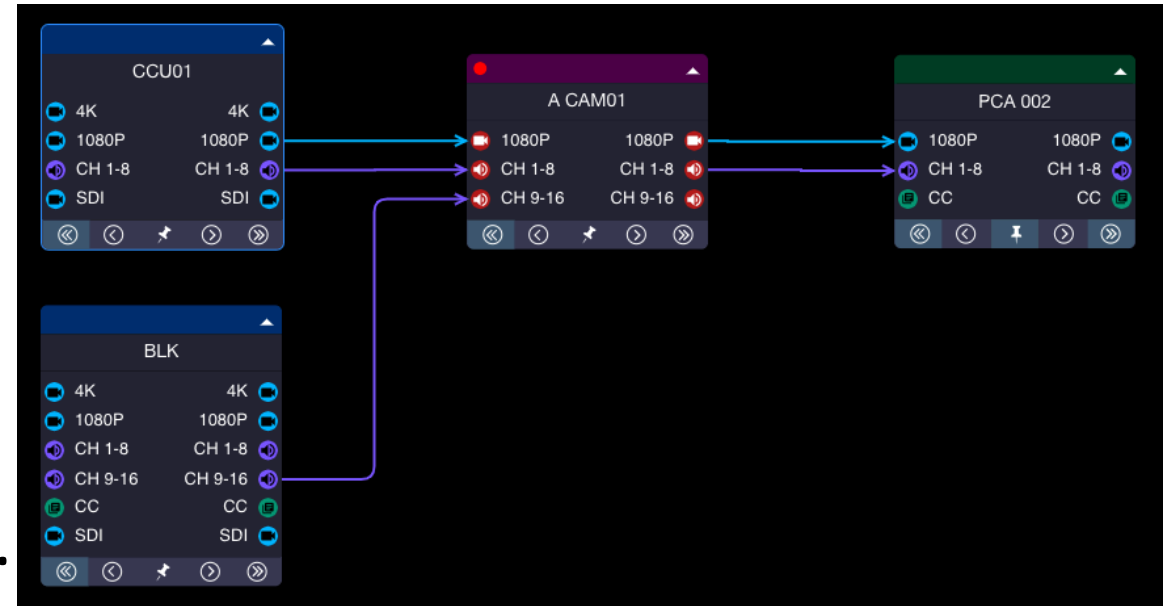
Lessons - Formats HD/UDH and SDR/HDR

- How does the device support them?
 - One format at a time, or both simultaneously?
 - If one, how does it switch? A checkbox or reboot? Can NMOS trigger it?
 - Can the device handle format conversion on the fly?
 - Reserve them for devices that can't generate the format.
 - If one, what else changes?
 - Example, using NMOS a devices in UHD mode uses 2 of the same GUIDs for HD and UHD and 2 new for UHD.
- Broadcast Controller software database entry considerations.
 - How does the routing deal with both when available?
 - Example, Sender can do transmit HD/UHD, and addressee is listed as capable of consuming both but is in HD mode only, UHD can be routed and engulf the system's receiver.



Tools

- Query and manage IS-04 and IS-05 software.
 - To assign Multicast addresses.
 - Confirm correct data.
- Signal path mapping software.
 - Illustrate how flows work.
 - Troubleshooting routes.
- Device status monitoring software.
- Deployment software.
 - Setup network switches.
 - Setup devices.



Elements

- PTP
 - PTP Leader capable of doing SMPTE ST 3059-2 profile.
 - Switches need to be able to handle the additional management packets.
 - Detailed infrastructure, especially priorities.
 - Having a solid PTP base and network allow to concentrate on the real issues.
- IP Gateways
 - High density and multi functions like frame sync, format, resolutions, color, delay and others.
 - From 1 to 4 channels for throw downs to deal with monitoring positions and/or one offs.



Thank you

Alan Wollenstein, NFL Media

alan.wollenstein@nfl.com

424-345-3107

