IP Router Technical Requirements

The Grass Valley Trinix SDI core video router in the existing trailer will not be retained in the new build. This project is an opportunity for NETC to transition to an IP-based video routing system. The timeline is expected to be Summer of 2025. Integration including installation for the new production trailer will be performed by contractor. Contractor must provide final commissioning and training. It will be expected that the Contactor will be on-site for up to the first three live productions to help with any technical issues and support. This could be placed as a line item option in the bid.

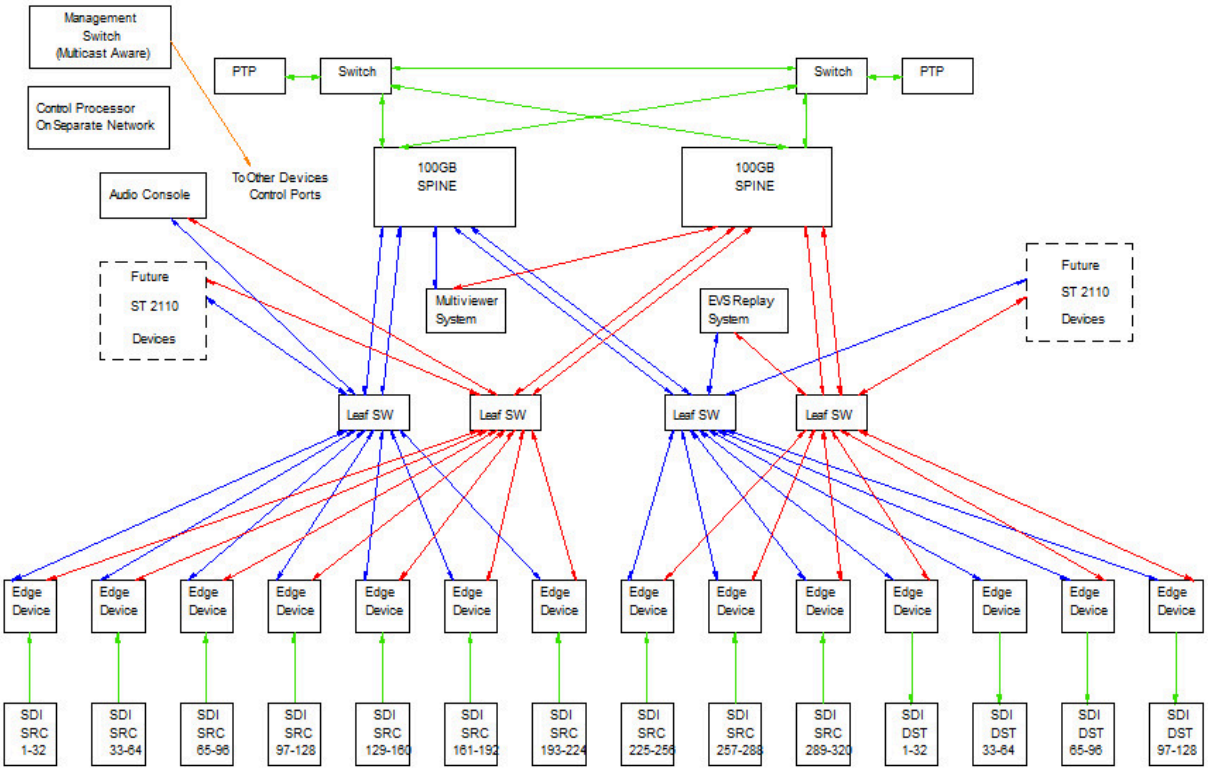
- Shall include multiviewer directly interfaced to IP router. Minimum of 192 inputs and 28 outputs for multiviewer. Multiviewer outputs should be HDMI. Proposed routing system must have direct 100Gb interface to multiviewer. Details regarding I/O counts for multiviewers can be found on Page 4, Deliverables. Multiviewer system capabilities should include but are not limited to the following functions:
    a. Programmable red/green tallies
    b. Audio level monitoring
    c. PIP reshuffling, resizing, and user programmable UMD.
    d. Clock and up/down counters.
    e. Monitoring by exception alarming
    f. ST 2110 proxy outputs

- Video Edge Devices must have BNC connections for 720p/1080i/3G/12G/4K.
- Edge Devices must include the following capabilities: frame sync, up/down/cross converters, audio embed/de-embed, mono audio shuffling and color correction for HDR and SDR workflows. Edge Devices must interface to external hardware controllers for color correction. If Edge Devices need to be reconfigured for specific applications (by means of downloading new firmware, etc.) the costs and procedures must be described.
- Simple router control panels must have at least 32 sources and control more than one destination.
- System must include analog, AES and MADI audio format.
- Systems must support SMPTE ST2110-30 conformance level B (Linear 24-bit PCM encoding at 48kHz, 1 to 8 channels per stream at packet time of 125µs.
- Systems shall support AMWA IS-08 Mono audio channel shuffle and manipulation

Bidder proposing routing system also must take into account that this is a router for use in a mobile environment, therefore overall weight of trailer is a consideration and equipment weight should be reduced where possible. Equipment proposed for this project must also be able to withstand transport which is the nature of a mobile trailer. NETC requests the bidder take into account the following considerations for equipment specifications:

- Auto switching in real-time fashion
- Real time sports production
- Network security
- Ease of use of equipment by operators.
- Quick configuration change and troubleshooting by engineering staff.
- Bidder to detail and specify any specific cooling requirements needed for mobile installation.
- Bidder to inventory power needs for proposed equipment and provide power budget information.
- Bidder to detail and specify any specific power conditioning requirements needed for proper equipment operation in a mobile truck setting.

Below is block diagram showing basic structure, topology, and signal flow of what the IP routing system may look like. This is a proposed drawing, actual system proposed by bidder may vary slightly.



Detail must be provided in the response describing how vendor will propose the new SMPTE 2110 router will integrate into a mobile live production truck environment. Routing system should have a topology similar to the diagram above. SDI total count will vary depending on final design. Detail should include items below:

a. Descriptions of edge/conversion devices needed.
b. Information on current industry standards used in project.
c. Descriptions of network topology.
d. Detailed steps on process of system integration.
e. Full connectivity diagram.
f. Multicast plan.

Contractor chosen by NETC will be creating detailed drawings and documentation for this project and equipment installation. The contractor/integrator may have specific and detailed questions for vendors during this process. Bidders on this project must work closely with and support integrator during the planning, drawing/documentation, and construction phases of the project.

EQUIPMENT RETAINED FOR USE:

The following EVS equipment will be retained for use with the new routing system. The equipment will be upgraded to support native ST 2110, please include this in the bid:

a. Qty. 2 EVS XT VIA 12 channel (EVS 2 – 6X SSMO)
b. Qty. 1 EVS XS VIA 12 channel (TD SpotBox)
c. Qty. 2 EVS rental units (consideration for SDI or ST 2110 connectivity is accounted for)

The following camera equipment will be retained for use with the new routing system. The equipment will connect to Edge Devices via HD-SDI for conversion to ST 2110. At a later time, these cameras will be upgraded to native 2110 connectivity:

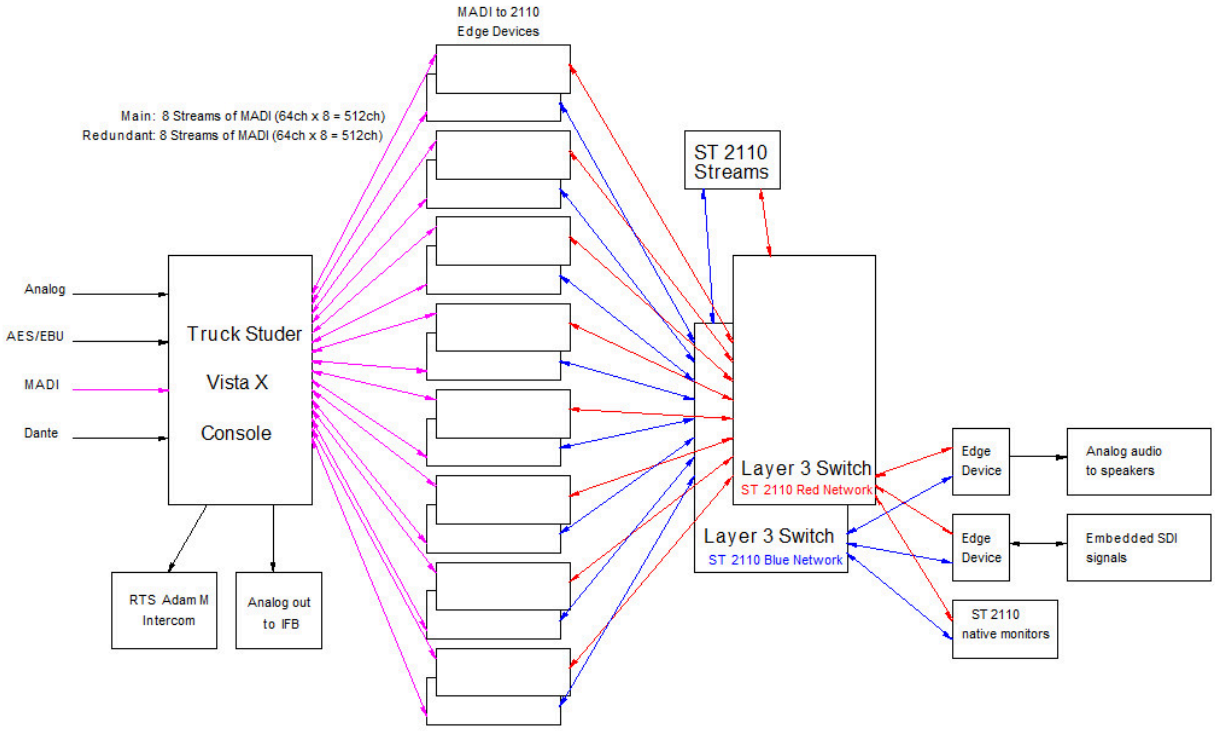
a. Qty. 2 Grass Valley LDX-86N
b. Qty. 4 Grass Valley LDX-80
c. Qty. 4 Grass Valley LDK-3000+
d. Qty. 2 camera rental units

The following character generator equipment will be retained for use with the new routing system. The equipment will connect to edge device with HD-SDI:

a. Qty. 1 VizRt OneBox (two channels)
b. Qty. 1 FoxBox (one channel)
c. Qty. 1 ScoreBox (one channel)
d. Qty. 1 FOR.A FVW-500HS Video Writer/Telestrator (one channel)

Several audio monitors will be retained and used with new production truck build. However, these monitors are fed by the audio console, analog outputs of devices, and/or analog audio DAs. No gateway device is needed for these monitors. However, two audio monitors will be purchased separately for use in the new trailer. These audio monitors will be capable of supporting ST 2110-30 streams.

The existing audio console in the production trailer is a Studer Vista X. The Studer console will be integrated into new production trailer build and new IP routing system by using MADI gateway at first and will be converted to full ST 2110 connectivity by NETC staff.



Existing RTS Adam-M Mid-size modular matrix intercom system will be retained for use. This intercom system has SMPTE 2110 interfacing capabilities, however, it is our intention at this time that there will be no tie-in between intercom system and SMPTE 2110 router. This intercom system does not take any embedded audio feeds. IFB feeds are fed by audio console and not integrated into intercom. Audio console Aux sends feed intercom, no mix minus busses are used.

Intercom and IFB systems are connected to audio console via analog connections. No Edge Devices are need for this purpose as these feeds come directly from the audio console.

Redundant Tektronix SPG8000A sync & PTP generators are currently installed and will be retained for use as PTP generators for this project. Bidder must interface to this equipment via provided switches if necessary as a source for PTP. Configuration of PTP may need to be changed to work with new routing system. GPS antenna will need to be purchased and installed.

The routing system bid must consist of primary and secondary cores, redundant control networks, and other necessary hardware to enable redundancy in topology to enable a redundant backbone. Bidder to provide details on how they will approach this redundancy.

Deliverables:

1. Edge Devices should accommodate HD-SDI connections with final number to be determined based off of final design.
2. Edge Devices should accommodate 32 signals needing up/down cross conversion and signal processing. All other signals can be simple SDI to ST 2110 encap-decap conversion.
3. Control Panels
   Hardware: 18 or more control panels with programmable LCD buttons.
   Virtual: Bidder please provide specifications and capability of virtual panels.

Multiviewers:

The table below shows the number of multiviewer monitors and PIPS required for each area in the new production trailer:

Area:	Audio	Production	Replay	Video	Engineering	**Total**
Monitors:	3	10 to 22	6 to 10	4	2	**25 to 41**
Total PIPS:	18	200	48	36	20	**up to 322**