



Overview

Organizations offering highly skilled production and animation services often have facilities located great distances from each other. Many times, customers are often not located in the same region where the creative work is prepared. This streaming solution allows the account management and customer to review creative work that has been prepared at locations a great distance away. Work is carried out collaboratively in real time; the customer and production company complete work quicker and more efficiently than before.

Solution Needs Assessment

Work Flow

Creative staff in the production facility have prepared the video or animation material and are prepared to play back the material for review. Account staff at the presentation suite manage the customer discussion and review workflow.

Source Inputs

Video or animation production equipment located in the studio output HD-SDI video with embedded audio.

Geography

The production staff and customer review facility may be located at opposite ends of a state or, continent or across the globe.

Network

Network switches supporting Layer 3 switching in the local area networks and an enterprise WAN will connect the two facilities. Sustained bandwidth of 100 Mbps is required through the full connection path to support streaming of the video at full fidelity.

Control System

The encoders and decoders must be configured to operate within defined bit rates when in use.

Functional Requirements

A very low delay must be maintained so that as individuals are discussing and working at each location, they are both referring to identical material. IP networks do not guarantee 100% packet delivery, so the streaming solution must maintain a stable picture, with reliable picture quality, even under heavy packet loss.

System Design Solution

Source Input

Video production equipment is used to prepare and play back high definition video content with embedded audio, which is output and presented on accurate-color HD-SDI flat panel displays. The displays are capable of presenting 10-bit video resolution and 4:2:2 color. The monitors are frequently color corrected to ensure the truest color is presented.

Streaming Video Encoders

Extron **VN-Matrix® 300** codecs employing the **PURE3®** codec interface the video production equipment. HD-SDI with embedded audio is encoded with low, 35 ms delay and the encoder preserves the 10-bit, 4:2:2 video quality contained in the serial digital video signal, critical to preserving the image quality that will be delivered to the far location. The VN-Matrix 300 codec is interfaced to a local area network to deliver the audio/video streams. A variety of compression and bit rate controls exist to allow delivery of the best picture given the available network bandwidth.

Network

Professional, local area network switches with Layer 3 switching and routing capabilities and 1000BaseT network connections are interfaced to the VN-Matrix codec. A firewall exists at each location and an enterprise WAN ensures that the HD video can be delivered with a sustained throughput of 100 Mbps. Network bandwidth for HD video may range from 50 to 90 Mbps and a block of 4 audio channels will require 16 Mbps. SD video may require 15 to 20 Mbps and a block of four uncompressed audio signals will require 8 Mbps.

Streaming Video Decoders

Extron VN-Matrix 300 codecs decode the audio and video signals rapidly with a 35 ms decode process. Audio and video are synchronized and the low delay of the total encode to decode path ensures that when individuals at both sites discuss the material, they are both referring to the same piece of content. An error concealment system in the PURE3 codec preserves a reliable, stable picture even when bit errors, jitter, or lost packets are experienced on the network. Visually lossless image compression by the VN-Matrix 300 codecs preserve the 10-bit depth and 4:2:2 color information. The post production color grading application in particular is very sensitive to accurate color reproduction of the original signal.

Displays

HD-SDI flat panels are positioned at the far end Video Production review suite. The monitors are capable of presenting a full 10-bit color depth and are color corrected to ensure accurate reproduction of the decoded video signal.



Location 1 HD Video Production Equipment

