



Timing Is Everything: Quarra Switches Ensure Precision Timing for Television City Studios' Move to IP

Introduction

Television City Studios (TVCS) in Los Angeles is a television production and broadcasting complex that opened in 1952. Some legendary shows have taped at Television City over the years, including *The Carol Burnett Show*, *The Price Is Right*, and *All in the Family*. *The Price Is Right* still broadcasts from there today, as do many other shows — like *The Young and the Restless*, *The Late Late Show with James Corden*, and *American Idol*.

Challenge

Among the many facilities at Television City are eight soundstages and a digital studio. Like so many others in the broadcast industry, Television City is migrating toward media over IP because of the technology's scalability, flexibility in managing content, ability to lower costs, and necessity in an all-digital infrastructure, among other reasons.

Synchronization and timing are essential in broadcast, and with Television City's move to an all-digital infrastructure in some of its studios, the old black burst and frame-sync timing methods that work in SDI environments were no longer viable. In media over IP, synchronization is carried out via Precision Timing Protocol (PTP). Television City's recent deployment of various systems operating in a SMPTE ST 2110 environment meant engineers had to build a reliable PTP distribution network from the ground up.

Solution

After exploring various alternatives, Television City opted for a pair of Artel Quarra PTP 10 Gbps Ethernet switches as the basis for its new PTP solution.

"We chose Artel's Quarra 10G for several reasons," said Jerzy Gorczyca, vice president of TVCS engineering. "For one thing, Artel gave us loaner units so we could evaluate the device before

moving forward with a purchase. During that time, we found that the accuracy was spot-on, and the web browser interface made for easy configuration. Also, Artel's engineers were readily available with complementary technical support whenever we needed it. Another determining factor was that Artel will work with us as our needs continue to evolve."

In the Television City workflow, two Quarra 10G switches serve as boundary clocks in the PTP distribution network. The boundary clocks support equipment in two studios in a redundant fashion (blue and red networks) and are referenced by Evertz 5700MSC-IP grand master clocks. The Quarra switches take PTP messages from the grand master clocks and pass them to other timing distribution switches located in different studios. (See Figure 1.)

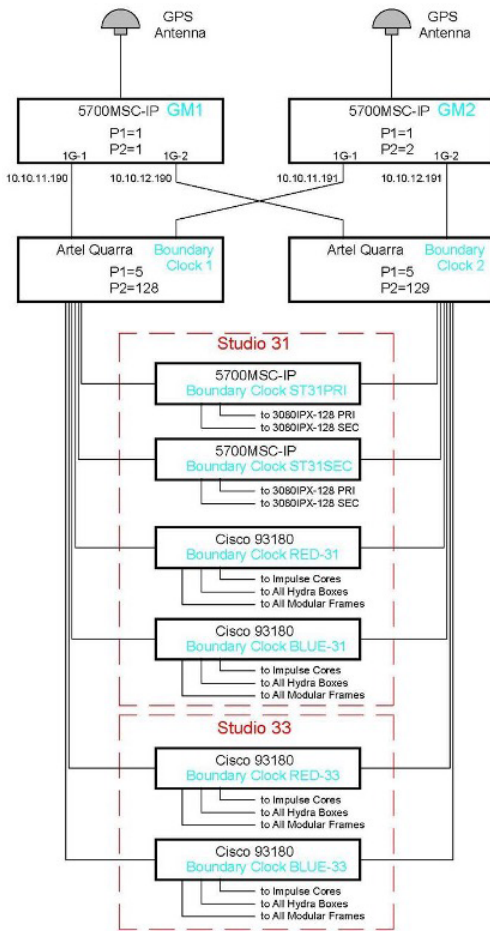


Figure 1

Results

With Artel’s Quarra 10G PTP switches give Television City Studios:

- The ability to support boundary clock or transparent clock mode.
- Accurate holdover when the PTP grand master is lost.
- Less than 30-second booting time, the fastest booting time in the industry.
- Nanosecond timing accuracy due to a design that uses accurate temperature and voltage-controlled, high-precision crystal oscillators.

As a result, Television City Studios can enjoy all the benefits of media over IP while assuring precise timing during all of its broadcasts. Signals are synchronized within nanoseconds so that TVCS can avoid the broadcast interruptions, unwanted noise, lip sync misalignment, and audio latency that arise from errors in timing. And audiences get the best possible viewing experience.

Having the high precision and high stability PTP distribution system gives us the full confidence that any potential packet loss in the SMPTE ST 2110 distribution or any system intermittent instabilities are rather resulting from some potential flaws in these systems and not caused by the PTP reference. Two fiber ports could be useful for providing reference over the fiber to a distant studio in our complex. However more optical ports would be welcomed for future expansion.



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