New World Symphony deploys the R&S®SpycerNode to satisfy its massive storage requirements.

New World Symphony in Miami, FL

At a glance

Miami based New World Symphony (NWS) is recognized around the world for training the next generation of musicians for leadership roles in professional orchestras and ensembles, but what's less well-known yet equally impressive is the institution's recently unveiled 4K Ultra-HD production, recording and presentation system.

"To our knowledge and [based on our] research, the installation is the largest in the United States in UHD – possibly in the world," says Dan Slentz, NWS Chief Video Engineer.

Executive summary

► **Customer**: New World Symphony
► **Task**: Implement Massive Storage solution for 4K Ultra-HD video system installation
► **Challenge**: Find a storage solution that can manage a vast amount of data
► **Solution**: R&S®SpycerNode,
► **Key advantages of this solution**: Highly scalable storage solution, Future Proof storage solution, HPC file system and comprehensive redundancy mechanisms, Highly interoperable

New World Symphony Enhances Patrons' Experience With New 4K Ultra-HD System

After more than three years, the symphony completed the $6 million 4K UHD installation in September 2019. Designed to delight patrons both inside and out of its concert hall and pavilion, the new 4K UHD video system also serves to educate musicians on site and remotely via the internet and to offer outside clients world-class production services for projects as diverse as PBS' Suze Orman, the Miami Sound Machine and the premiere of the HBO Series Ballers.

"The only type of production that can rival it in terms of production size and ability is to bring in multiple box trucks and then rent a facility and rent multiple production systems," says Slentz.

No Time For Latency

Once NWS chose native 4K UHD as its acquisition, production and presentation format, the organization had to decide the best method for signal transport.

"We knew we didn't want to go 4K IP," says Slentz, "just because of the nature of what we do and the latency in a concert situation. It's critical that there be no visible or measurable latency."

While concertgoers typically expect to be immersed in music, the New World Symphony takes that experience to a whole new level. With the assistance of seven servers and multiple projectors strategically located throughout the hall, patrons are immersed in an impressive video presentation of concerts blended together across the architectural features of the hall. To pull off this feat, it is necessary that what concertgoers see on stage syncs visually with what is being projected.

Thus, 12G SDI for signal transport offered the performance needed, says Slentz. However, relying on 12G to minimize latency and Apple ProRes 4444 to satisfy the organization's desire for the highest possible quality means each new concert generates vast amounts of data to be stored.

> "One of the reasons we chose Rohde & Schwarz was our confidence that they will be with us, meeting our needs on the cutting edge," he says. "Another was our ability to grow the SpycerNode cost effectively as our storage demands increase through the years."
>
> **Dan Slentz, NWS Chief Video Engineer.**

Even before the 4K Ultra-HD install, the organization had a good sense of how much data would need to be stored. Over four years of recording HD to its corporate 800TB NAS, the video department had managed to use 450TB.

"When we did the math of what we would need for 4K, especially considering we can record 10 channels of simultaneous ProRes 4444 in 4K, we quickly decided we would need something of significant size that could handle that much data," says Slentz..

Storage Requirements

To satisfy its massive demand for storage, NWS selected the R&S®SpycerNode, a highly scalable storage solution specifically designed to meet the capacity and bandwidth requirements of M&E organizations.

"Part of the reason we chose the Rohde & Schwarz SpycerNode was the ability to grow the system cost effectively," says Slentz. "We knew that at best we would have four years of concerts and that there were many things we could port onto and store on that server."

Currently, NWS is using just under half of a 72-inch-high rack for 1.4 Petabytes (PB) of storage. It expects to be able to store about 5 PBs when the rack is fully populated, he explains. Each production is archived as a clean feed as well as a second version with graphics and text added to the program feed. ISO camera shots are also recorded to R&S®SpycerNode storage.

The R&S®SpycerNode takes advantage of High-Performance Computing (HPC) redundancy to protect media content as well as IBM Spectrum Scale technologies to reduce rebuild times in the event of a system failure by up to 75 percent when compared to traditional RAID approaches.

At NWS, the R&S®SpycerNode is located in the organization's IT server room because that's where its central fiber terminates. The R&S®SpycerNode is tied into the organization's Fiber Switch, providing six craft editors using Adobe Premiere with access to content.

"With what we've done at this point in the season, we've had no bottlenecks, no issues," explains Slentz.

UHD Production

To shoot concerts in 4K Ultra-HD, NWS relies on 21 cameras, including seven Panasonic PTZ cameras and 14 Hitachi studio cameras, 11 of which are mounted to Telemetrics robotic systems and two that are operated manually.

The organization's complement of 4K Ultra-HD production technology includes a native 12G 64 x 48 production switcher, a 12G 144 x 144 routing switcher and two 12G

character generators. A second control surface for the 12G production switcher located in a remote production control room has full access to the institution's 4K UHD production resources and is used for productions from a practice area in the concert hall's SunTrust Pavilion, says Slentz.

While the installation primarily relies on 12G SDI cabling, not all manufacturers were able to support the single-cable solution. In those instances, Quad Link 3G is converted to 12G SDI with converters. "This was possible as no latency was introduced, and it was far more cost-effective than manufacturer upgrades or replacement," he says.

HD multiviewers are used for monitoring because there is no benefit to seeing UHD images on 8-, 15- and 20-inch monitors, he says. However, monitoring Program, Preview and 12G routing is done in full UHD on large OLED monitors.

To support HD monitoring as well as an in-house video distribution system, NWS relies on a 64 x 64 high-def routing switcher. UHD productions are downconverted for the facility rental clients of NWS who require an HD finished product.

The Wallcast

Besides the immersive video experience projected inside the concert hall, the New World Symphony frequently projects Wallcasts of its concerts on the building with three 35,000 lumen projectors.

"The projected images overlap and produce an image on one-third of the face of the building," adds Slentz. "That one-third measures 100 feet wide by 70 feet high."

Wallcast concert video is supported by 139 Meyer speakers that deliver more than 60,000 watts of sound. The setup, a Constellation system, produces 139 discrete

R&S®SpycerNode at the New World Symphony IT server room

New World Symphony in Miami, FL

channels of audio that reproduce sounds exactly as they would be heard sitting inside the concert hall.

Offering concerts for free to those standing outside the building in Soundscape Park gives the New World Symphony a way to delight thousands of additional people who otherwise might not be able to secure one of the 800 seats inside the concert hall.

"Last year, we had John Williams conduct our orchestra for our yearly gala, where he conducted some of his incredible movie work –from Star Wars to Harry Potter— and both the concert hall and park were packed," recalls Slentz.

All three projectors outside the building are scheduled to be replaced this summer with 40,000-lumen 4K laser projectors as will the 15 projectors used inside the hall to create the immersive concert experience. The addition of the new projectors will take the total price tag for the 4K UHD upgrade of the New World Symphony to just under $8.5 million.

A Unique Vision

Slentz credits Howard Herring, CEO of the New World Symphony, with recognizing the value of technology in the presentation of the arts and the leadership he has provided.

"Howard makes New World a premier, recognized leader in the arts," comments Slentz, "and he sees where technology invites tomorrow's arts supporters."

Under Herring's leadership, the New World Symphony has become one of the first cultural institutions in the United States to put an end-to-end 4K infrastructure in place to capture and present concerts, thanks in part to the financial support of the Knight Foundation and the City of Miami.

Video is so important to the institution that it regularly commissions and presents video to accompany classical works, which then are stored on the R&S®SpycerNode for future presentations by the New World Symphony and other symphonic institutions.

"Howard sees a vision for the future in the arts that includes a lot of advanced technology," continues Slentz. "He tends to make New World, the cutting edge— sometimes the bleeding edge for technology—but we hopefully live up to his expectations in what we do."

Even while the organization is currently completing its 4K Ultra-HD setup, Slentz has taken an integral step by deploying the future-proof R&S®SpycerNode to make sure the New World Symphony is ready for the next generation of video when it becomes more widely available.

"The way this system is wired [with 12G SDI], we've attempted to allow future use in 8K if needed," says Slentz.

"I knew Rohde & Schwarz from their transmitters, and their transmitters are seriously top of the line," says Slentz. "And their test equipment is top-notch, too. So, knowing the reputation of the company added a big comfort level when we decided on the R&S SpycerNode."

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