

# NDI<sup>®</sup> PROVES INSTRUMENTAL IN KEEPING GUILDHALL PLAYING

London's flagship institution for music and performing arts education met Covid-19 challenges with a new NDI<sup>®</sup> infrastructure and TriCaster<sup>®</sup>, connecting students and staff



Accurately networked sound and vision isn't always the highest priority for an educational institution. But for London conservatoire, Guildhall School of Music & Drama, progress in orchestral music and performing arts has to be analysed on a regular basis. An upgrade to recording infrastructure led to a massive leap in connectivity for a school full of the country's best-performing artists. The NDI<sup>®</sup> protocol now delivers extremely low-latency video over IP that dovetails completely with Dante-networked audio, producing a dynamic, safe and extensible educational environment.

## A CONCERTED EFFORT

Guildhall School is a vibrant, international community of musicians, actors and production artists. Ranked top UK conservatoire in the *Guardian* music and drama league tables, it consistently delivers world-class professional training, in partnership with distinguished artists, companies and ensembles. Pre-pandemic, a team of nine, led by head of recording & audio visual, Julian Hepple, was delivering up to 8000 recordings a year, already putting a strain on infrastructure.

"For a small institution with 1200 students, there's lots of activity at the school," says Hepple. "In one day, we might have three studio recording sessions, a big-band gig, an opera, a play, four chamber works, plus a lecture or six at the same time!"

"When Covid-19 hit, the School asked if there was anything it could do to the digital infrastructure to support us through this pandemic, as well as improve our teaching and learning facilities for when we opened up again."

The pandemic meant live performances might have to incorporate streaming, and remote collaboration was more necessary than before.

"We needed to overcome a couple of obstacles," Hepple says. "First, we had to be able to record lots of performances – simultaneously and really easily. A lot of that would be piloted by one person, but we also required a TV studio to do our flagship productions. Space flexibility was key, and our facilities had to allow large numbers of people to create music or share education simultaneously."

Social distancing rules dictated three metres between musicians. "Our concert hall, usually fitting a small symphony orchestra, could only fit 15 players. Suddenly, we couldn't facilitate large



ensemble performances, removing a huge part of training practice for the musicians and actors."

It also meant the final of the Gold Medal – Guildhall School's premier music prize, traditionally awarded each May in a sold-out Barbican Hall – would not take place.

Founded in 1915, and surviving two world wars, the competition had never been cancelled.

#### THE SHOW MUST GO ON

The Guildhall team, including Sam Ziajka, recording and AV network and systems manager, sought a protocol that addressed all the challenges, deciding that an NDI system would be the best fit. Developed by NewTek, now part of the Vizrt Group, NDI enables disparate systems and devices to connect and communicate over IP networks, creating an IP-based production environment with shared access to video, audio and data.

Working with NewTek senior solutions architect, Liam Hayter, as well as technology solutions reseller and workflow design firm, Altered Images, Guildhall devised a project for an entirely new NDI network in May 2020. It covered four buildings in different parts of the campus, working seamlessly with the existing Dante audio network. PTZ cameras were installed in each orchestral room, providing the conductor with a view of the musicians working in a room of their own. A PTZ camera livestreams the conductor's gestures back to screens in the rooms.

According to Altered Images MD Tony Gill, the sheer scale of the project was a challenge, as well as planning and installing the system under Covid-19 restrictions. "With government guidelines



© Gold Medal low latency set-up - Clive Törman

## WE NEEDED TO BE ABLE TO RECORD LOTS OF PERFORMANCES – SIMULTANEOUSLY AND EASILY

changing throughout the project, I didn't want to overcommit," he says. "But when we heard that Gold Medal had never been cancelled, we just had to make it work. We had a couple of clever engineers – our CTO and installation projects guy – who worked pretty much exclusively on this project for weeks to get it from a design phase."

#### TIME SIGNATURE

Keeping down network latency was essential, with thorough stress tests off-site and on-campus.

"The conductor is sculpting the orchestra," explains Hepple. "The basic technical requirement is that each pair of eyes must see the conductor at the exact same time, so when that downbeat is placed, everyone can respond accordingly. It's not something you have to worry about in a live setting.

"We installed a bunch of screens in each room. As well as the musicians always seeing a conductor, this means each room also has a quad view of the other rooms, so there's a sense of visual connection among the musicians."

Some of the rooms had 4K flat-panel displays on the walls. Others had cheaper, 32-inch LCD screens, along with a mix of old SDI and newer fibre network connections to contend with.

"It was remarkable how little impact any of that had on our chain – NDI is amazing," Hepple observes. "The biggest differential was one room that was three frames behind the real world, and one at four frames behind. We're talking about one frame difference across 900m."

It became demonstrably clear that 1080p50 video could be transferred anywhere on campus in a tenth of a second.

"This was significantly quicker than expected," says Hepple. "Most importantly, it arrives at any screen with the frame locked, meaning everyone sees the exact same image at the exact same time. As such, a large ensemble – wherever they are – can see a conductor simultaneously."

"The only person experiencing any latency is the conductor, who sees the rooms that he is choosing to conduct at about a tenth of a second behind – in conductor terms, that's nothing."

**THE NEXT STAGE**  
In the performing arts, timing is everything. Guildhall's new installation lets talent from all departments collaborate in ever more creative ways



© Gold Medal low latency set-up - Clive Törman



© PodMidsummer BTS - Mhaeath Bodlovic

## WHEN WE HEARD THAT GOLD MEDAL HAD NEVER BEEN CANCELLED, WE JUST HAD TO MAKE IT WORK

While the initial idea for the system was to enable streaming and recording in different rooms, what had not been in the original plan was for those rooms to work together. With a NewTek VMC live production system at the heart of a single NDI and Dante-enabled network, the building could act as one united venue.

"With the help of Tony Gill, Liam Hayter and all of our team, it was all delivered and working by the start of September," says Hepple. "The whole system now has about 150 NDI endpoints, covering 30 different rooms. The network has 15 switches and about 600 ports around the School. We've got a lot of mobile kit we can fly into any room that has CAT-5 infrastructure. It's so flexible."

Ziajka adds: "There are 20 PTZ cameras and controllers, 30 studio encoders, 25 mini encoders and 15 PCs hooked up to the network that all have the NDI Tools, so we're able to pull signals in and out of those machines. NDI Tools is a free suite of applications designed to integrate NDI into production workflows."

According to Ziajka and Hepple, the system 'just works.'

#### GOLDEN PERFORMANCE

In the end, the Gold Medal event went ahead in September 2020.

"That was the first orchestra to perform since the lockdown," says Hepple. "Since then, we've done four or five other full orchestral projects, tonnes of big band stuff, plus an orchestral Beatles project. We've carried out about 300 public-facing productions over the past year – exactly the same as the School put on in pre-pandemic times. Students haven't missed any opportunities. Now, they're just performing live to a camera, instead of an audience. We've managed to minimise the amount of disruption to student experience."

Hepple says many suppliers and manufacturers don't understand that customers like Guildhall just want to do the simple things really well.

"Manufacturers might often come at you with a far more complex offering that isn't necessarily relevant to your environment," he says. "What we got from NewTek and Altered Images was a total understanding of what we wanted to do."