

CP Communications Unleashes IP Acquisition and Bonded Cellular Coverage Strategy for NYC Marathon

Live content acquisition expert achieves 100 percent coverage of 26-mile race across the five boroughs



Scenario

The fall of 2018 marked the 48th anniversary of the TCS New York City Marathon, considered the largest marathon in the world. The November 4 race welcomed more than 50,000 participants. Starting in Staten Island, racers wound their way through Brooklyn, Queens and the Bronx before finishing in Manhattan at the southern edge of Central Park.

CP Communications is a market-leading specialist in content acquisition and coverage for sports and live events, including past NYC Marathons. The company has increasingly adopted IP, cloud and bonded cellular networking for signal transport, these newer technologies possessing the bandwidth necessary to move high-resolution video and audio content when RF is limited or unavailable.

The NYC Marathon is particularly challenging, however, as certain parts of the city lack RF, cellular and IP availability. To overcome this obstacle, the CP team developed a hybrid solution that mixed IP and bonded cellular with traditional

Solution Features

- Four customized Smart camera cars with IP and bonded cellular signal transport
- Three IP streaming sites, 600 unique IP addresses
- 11 cameras and 240 intercom ports over IP and bonded cellular
- 14 live streams for at-home production

RF to assure coverage over the entire 26.2-mile race.

Solution

In the weeks before the event, the CP team charted areas along the course with cellular coverage challenges. Of particular concern were places where large crowds of spectators could potentially overtax

cellular networks. In addition to the area around the starting line, cellular coverage was expected to be especially challenging along the Verrazano-Narrows Bridge heading into Brooklyn and at the finish line.

No matter where runners were on the course, CP's job was to ensure that at no point during the race would video and audio signals be lost. The solution? Smart cars customized with bonded cellular and IP networking capability.

The overall content acquisition strategy utilized four electric Smart cars, four motorcycles and other special motorized systems (including two POV wheelchairs) outfitted with cameras and bonded cellular solutions from Mobile Viewpoint. The vehicles were networked to CP's flagship HD-21 RF truck, where their signals were received and processed before being passed to NEP ESU OB trucks stationed at the finish line, which produced the world feed uplinks and the local and national television feeds.

The core of CP's operation comprised three main sites: the starting line in Bay

CP Communications Covers the NYC Marathon



Customized CP Communications Smart car with Condorcam camera rig on the back

Ridge, near the Millennium Hotel in Manhattan, and at the finish line. IP streaming sites were positioned in Brooklyn, the Bronx and Manhattan. Nearly 600 unique IP addresses were utilized, as well as a MIMO (multiple input multiple output) mesh network across the Verrazano Bridge, to backfeed internet access to the Smart cars and deliver intercom and other services.

"We added COFDM traditional microwave receivers to get the coverage we needed off of the bridge, due to the limited cellular coverage, and deployed COFDM near the finish line for the same reason," points out CP Communications CEO Kurt Heitmann. "That safeguarded our operation for the first and last mile of the race in case the limited cellular coverage caused the signals to drop."

Previous marathon coverage relied almost exclusively on traditional RF topologies, though CP Communications introduced its first IP-enabled Smart car as part of the 2017 race. The four cars at the 2018 race were outfitting with IP transport and bonded cellular networking to assure coverage in most areas between the start and finish lines. The cars also provided DC power from marine deep-cell batteries to Condorcam 1080p stabilized camera rigs mounted on the back of each vehicle, as well as a Silvus Technologies MIMO mesh network node and Mobile Viewpoint Agile Airlink multicamera encoder. The Airlinks combine H.265 (HEVC) video encoding with patented cellular bonding technology to reliably transmit video over bonded IP connections at the highest possible quality using the least possible bandwidth.

In addition to backfeeding internet services to the cars, the 5.2 Gb/s MIMO mesh network provided redundancy for a Unity Intercom system, assuring continuous support communications between the CP truck engineers, field technicians, journalists and race participants. The rooftop array for each car included COFDM and mesh network antennas, as well as carrier "fins" from AT&T, T-Mobile and Verizon that strengthened carrier aggregation for improved cellular coverage.

Not only did the CP team utilize IP technology on the course, its Red House Streaming unit also streamed live content from 14 video sources for **at-home production** — a first for the NYC Marathon. Video services were complemented by a Dante audio network and an RTS RVON communications network from the start line to the broadcast center, allowing the production team to produce the entire show from the NEP truck.

Benefits

The move away from traditional RF and toward IP and bonded cellular simplified the citywide production setup process. By utilizing 85 Sonim XP8 smartphones and Unity Connect intercom system, the CP team was able to avoid New York's busy UHF system. All 85 smartphones communicated with **Mac** servers based at the finish line, with all configuration and adjustments able to be made over the air. The Unity application provided the flexibility to give each user an individual profile and the ability to create and address group settings. CP also utilized Unity for two wireless commentators who traveled along the course in the Smart cars.

"RF frequencies are increasingly difficult to come by in crowded metropolitan areas, and shifting from frequency coordination to wireless IP changes the entire game," said Heitmann. "There is some complicated work mapping out IP addresses and gateways early in the engineering phase, but we eliminated rooftop positions around the city as well as the enormous manpower and equipment that comes with that job. The technology is leaps and bounds beyond where it was five years ago, and it's changing the way we manage content acquisition for the event producers and host broadcasters we partner with."

The CP crew ultimately achieved 100 percent video and audio coverage of the men's and women's races, unleashing a comprehensive IP and bonded cellular network for the first time.

"We were extremely pleased that the strength of the network architecture allowed us to stay purely in IP through to the finish line after crossing the Verrazano-Narrows Bridge," Heitmann concluded. "In the end we carried bi-directional video and audio from 11 cameras and 240 intercom ports over IP and bonded cellular, with Mobile Viewpoint solutions providing the robust compression we needed to optimize bandwidth and deliver exceptional video quality. This was a first for the New York Marathon, and a big step up from our past coverage strategies."



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