



Solution: NetCloud Service with CBRS-Compatible Routers ■ **Industry:** Education ■ **Use Case:** Private LTE for Remote Learning

Students Use School District’s Private Cellular Network for Better Distance Learning Experience

Murray City School District cost-effectively provides and controls CBRS-driven Private LTE network for hundreds of households



It’s perfect that we’re able to use CBRS spectrum, which provides really good bandwidth, and LTE, which has really good management of that bandwidth. This provides the connection stability and performance our students need to thrive with remote learning.”

Jason Eyre, Technology Department Coordinator, Murray City School District

Summary

Challenge — In 2020, the Murray City School District in Utah was facing a common but critical pandemic-related challenge: With children and parents stuck at home for remote work and distance learning, high-bandwidth technologies such as teleconferencing were becoming unreliable. Consistent, high-performance Internet access had become a key need.

Solution — As part of an ongoing Private Cellular Network project, the district began sending Cradlepoint’s Private LTE routers home with families needing better connection performance than most wired broadband could offer. With Cradlepoint NetCloud Service, the IT team controls security and configurations from afar.

Benefits — By leveraging Citizens Broadband Radio Service (CBRS) spectrum through enterprise-grade wireless edge routers, the IT team can control its own cost-effective cellular network and students at home can keep their online studies separate from all other streaming.

Background & Challenges

Located in Utah's Salt Lake Valley, Murray City is home to nearly 50,000 people within about 4 square miles, including thousands of students who suddenly needed highly reliable and high-bandwidth Internet connectivity at home once the COVID-19 pandemic forced school shutdowns in 2020.

The Murray City School District (MCSD) already was rolling out a 1-to-1 technology program, sending Chromebooks home with all students in grade 3 through 12. However, with all learning taking place online and largely through live streaming, the access variance from one household to the next had the potential to drastically accentuate the digital divide.

“The pandemic has kept many moms and dads at home for remote work while multiple children are at home, doing Zoom meetings with their teachers. Even in households with fiber connections, home broadband hasn't been quite strong enough to support all of this simultaneous streaming. As a result, many weren't able to do as much real-time learning as they needed,” said Jason Eyre, Technology Department Coordinator for MCSD.

The district had already begun using PLTE for streaming footage from on-campus surveillance cameras. While MCSD had experienced success with PLTE at schools, providing this service across the entire district would be much more challenging.

Difficulty ensuring high-performance connectivity for 1-to-1 devices

— Chromebooks don't support CBRS spectrum, and basic consumer-grade hotspots are too unreliable and difficult for IT to manage while lacking advanced features for network management and security. The school district needed a more sophisticated solution.

Inability to provide on-site IT support

— Whichever solution MCSD found would need to include a cloud-based network management platform, because the IT team doesn't have enough staff or time to make updates or troubleshoot problems at each student's home.

Budgetary limitations

— MCSD would only be able to offer PLTE throughout the city if it could keep costs down, particularly regarding ongoing OpEx. The district wouldn't be able to afford a pay-per-bit cellular plan for each student's home.

Solution

After careful planning, MCSD decided to roll out a cost-effective Private Cellular Network system — funded in part by a CARES Act grant — throughout the area, utilizing Cradlepoint's NetCloud Service with more than 400 CBRS-compatible wireless edge routers for uninterrupted remote learning in households with three or more students. These enterprise-grade routers, also referred to as user equipment (UEs) or customer premises equipment (CPEs), comply with FCC regulations regarding CBRS spectrum allocation.

With a couple dozen eNodeB citizen broadband radio service devices (CBSDs) — similar to Wi-Fi access points — set up at strategically selected locations all over town, the school district has a PLTE network that students can connect to for free, high-performance Internet access.

MCSD determined cellular connectivity could be a cost-effective way to ensure a consistent remote learning experience for everyone — especially if they could implement and leverage CBRS shared spectrum to create a Private LTE (PLTE) network.

“It's perfect that we're able to use CBRS spectrum, which provides really good bandwidth, and LTE, which has really good management of that bandwidth. This provides the connection stability and performance our students need to thrive with remote learning,” Eyre said.



Benefits

Dependable wireless LAN connectivity throughout town

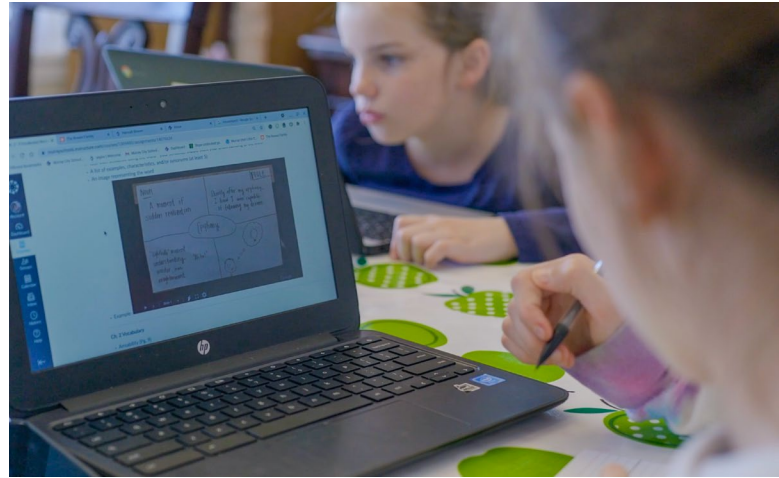
A private network that the IT team can fully control through cloud-based tools gives MCSD the power to keep students from all socioeconomic backgrounds connected to classes and schoolwork, allowing them to thrive while learning from home.

“Cellular diagnostics through NetCloud helped us figure out which areas of town would be most problematic. And now that everything is set up, ongoing diagnostic information will enable us to quickly troubleshoot connection challenges,” Eyre said.

Efficiency of centralized deployment, monitoring, management & troubleshooting

Once these easily preconfigured, plug-and-play routers are sent to students’ homes, the families themselves can get the solution up and running in just a few minutes. The district’s IT staff can push out security and firmware updates from anywhere through NetCloud, as well as adjust what children can search for on the web

“In nine out of 10 cases, we simply send a preconfigured Private LTE router to a family and tell them, ‘Plug it in, turn it on, and set it in a window sill.’ From there we can see how it performs, and then remotely control any necessary tweaks as needed,” Eyre said.



Free CBRS spectrum reduces OpEx

Beyond the initial CapEx infrastructure costs, MCSD found significant cost savings with Private LTE, compared to the unpredictable cellular usage and billing sometimes associated with public LTE. Without the need to pay any monthly fees to network operators, the district’s lone recurring expense is the spectrum allocation server (SAS) subscription that enables the IT professionals to control the power and frequencies used by the CBSDs, or radios.

Successful model for other school districts

MCSD’s successful and rapid deployment of Private LTE for remote learning is providing a model for other school districts throughout Utah, through support from the Utah Education Network (UEN). This government-run managed service provider can help bridge the digital divide for students requiring constant connectivity across dozens of communities.

“Out of all the devices we have tried on this network, the Cradlepoint devices are the best at keeping and maintaining the connection. There is a secret sauce to the combination of antennas and chipset that makes this more reliable than anything out there,” Eyre said.

Explore Private Cellular Network solutions at [cradlepoint.com/pltenow](https://www.cradlepoint.com/pltenow)