

# Miami-Dade County Public Schools

An innovatively simple wireless network enables “digital conversion” to new ways of teaching and learning



## Business Profile

The fourth largest public school district in the United States, Miami-Dade County Public Schools has 344,000 students, 40,000 teachers and staff, and 392 schools, many in economically disadvantage areas.

## Challenges

- Give every student equal access to technology for learning and future success
- Manage technology for uninterrupted learning for hundreds of thousands of students and teachers
- Meet state and district mandates for the adoption of e-textbooks, online courses, and online assessment

## Deployment Summary

- Wi-Fi access in 392 schools connecting 400,000 users via BYODs and district-issued devices
- 20,000 access points deployed, consisting of AP311s, AP320s, and AP433s
- 100 Meru controllers deployed, including MC1000, MC3000, MC3200, MC4100, MC4200
- Meru Network Manager for simplified and affordable management and capacity planning
- Meru Connect planned for transparent, consistent user experience

## Benefits

- Ability to scale the network and add access points without the cost and trouble of re-engineering
- Reliable high-performance in high-density areas such as auditoriums and cafeterias
- Reliable, stable connection for online testing
- A responsive technology partnership for mission-critical wireless infrastructure

*“We looked at a lot of the technology out there. We saw the single-channel architecture that Meru provided, and that was something that we could understand really easy. We could deploy it on a large scale and we could support it. Meru just seemed to be the perfect fit at the perfect time”*

- Paul Smith, director of Technology Services



## WLAN for a massive 1:1 “digital conversion” of learning

The fourth largest school district in the United States gives hundreds of thousands of students many different ways to learn and prepare for their future. Choices include flexible classrooms, magnet schools, career academies, and IPREP academies where the setting is more like a café or home than a traditional classroom. “Our vision goes beyond issuing iPads to everyone. We call our one-to-one initiative ‘digital conversion,’ which transforms instruction from the traditional teacher lecturing to the class to a personalized collaborative differentiated instruction programs,” says Deborah Karcher, CIO of Miami-Dade County Public Schools (M-DCPS).

Underlying the digital conversion within M-DCPS is an innovatively simple wireless network providing connection for 400,000 students and staff in 397 schools.

“We have looked at almost every wireless product out there, and we continue to look at every wireless product. You name a name, and we’ve seen it before. We piloted it, we trialed it, and we always go back to Meru because Meru is rock solid. We have not found any Wi-Fi technology that can compete with Meru on the scale that we need to happen, and at a price point that we need to have,” says Karcher.

### Toward a connected community

Miami-Dade County Public Schools has all the challenges of public education in abundance. The students come from every rung of the economic ladder. While some students carry the latest iPad or 4G phone in their backpacks, many others have no computer or Internet access at home. “Students are at a distinct disadvantage in life, if they don’t have a computer at home and attend a school that has a computer for every child,” says Karcher.



The M-DCPS vision for technology equality extends beyond school walls to a connected community. Providing technology access is a moral imperative for the district. “There must be no digital deserts in the Miami-Dade community,” says Alberto M. Carvalho, superintendent.

Under the leadership of CIO Karcher, the first step toward a connected community was DadeSchools.net, a set of portals for students, parents, teachers and staff, and the community as well. Students can download their virtual backpack of e-textbooks, take online courses in a virtual school, search the public library catalog, and take advantage of many other resources. Parents can check grades, apply for programs, and get information on school policies. A community portal provides links to information about the district, volunteer opportunities, public health, adult education, and much more. “We were thinking in ‘cloud’ terms, even before ‘cloud’ became a concept with a name,” says Javier Perez, executive director of Infrastructure and System Support.

### Embracing BYOD—bring your own device

With the portals and content in place, the focus turned to the means of access. The district has 130,000 desktop computers, not enough for the entire student population. While the visionaries of the district expected computers to decline in cost, the explosion of relatively low-cost mobile devices has been a bonus. While the district issues devices for certain programs such as seventh grade Civics and ninth grade World History, it also encourages BYOD. “We want to leverage what students have in their backpacks, and let them bring their own devices to use responsibly at school,” says Paul Smith, Director of Technology Services. “Accommodating BYOD (bring your own device) will make achieving our 1:1 goal for students and technology a lot more affordable.”

More than that, it’s a smart move pedagogically, Smith adds. “Children just automatically embrace this technology. They learn better with this type of technology than from traditional hardcover textbooks.”



## Doing 1:1 right

The “digital conversion” that Karcher and her team talk about is so much more than giving our mobile devices to students and teachers. “I don’t want you to go away thinking that 1:1 is just having a kid have a device. There are many other pieces that need to be put in place first. Until you have A, B, and C, you really can’t do D. If you look at many one-to-one initiatives, it’s usually the device first and then everything else follows. When we hand out our devices, and we’re set to hand out about 30,000 in the next month or so, we are



not worried about what they’re going to look at. We’re not worried about what can connect. We’re not worried about who can connect. Everything is already in place for that piece of it,” says Karcher.

The “essential pieces” Karcher refers to are, in order:

- A. Applications and digital content that work on any device.
- B. Bandwidth and capacity to support the content on the network.
- C. Connectivity, the ability to connect anywhere, anytime, with any device.
- D. And last of all, the devices issued to the students and staff.

Before M-DCPS even considered issuing devices or letting students use their own, many phases had to be completed. Fiber had to be extended to the perimeter of every school because ultimately all the school networks would be centrally managed from the district data center. A wireless network had to be deployed at the schools and offices. A Meru wireless network infrastructure was selected and deployed in the schools as funding was available.

M-DCPS obtained funding from the FCC E-Rate program to deploy Meru networks in the schools with the greatest need first. Eighty-seven percent of the schools in M-DCPS qualify for E-rate subsidies, many at the maximum level of 90 percent. The community stepped up with private donations and non-profit grants to cover the remaining amount required from the district in matching funds.

“We had challenges that only Meru’s unique architecture could solve,” says Smith. The first and foremost, he stresses, the network has to be easy—easy to install, easy to manage.

*“This relationship goes beyond just providing infrastructure to a business. The future of our schools and our children are involved. We have put our trust in Meru.”*

– Deborah Karcher, CIO

## Wi-Fi that’s the perfect fit

“What we have is more technology with fewer people to maintain it. So we looked for a system that was easy to install.” At the same time, it had to have many other attributes.

- **Scalable.** The district’s need for connectivity is accelerating.
- **Reliable.** Classroom time is at a premium. Teachers can’t spare even 15 minutes to a technology that is slow or not working. All core testing is also now electronic and computer-based, requiring that connections be absolutely reliable.
- **Agile.** “How we use the schools is changing dramatically,” explains Smith. We need agile connectivity, where we can move a kid anywhere within the school environment and still have them connected.”
- **High-performance.** New educational content such as multimedia and IPTV depend on it.

But Smith comes back to “easy.” Meru offered all the advantages that are important to the district, but if the network isn’t easy to deploy and support, the other advantages are out of reach. “We looked at a lot of the technology out there. We saw the single-channel architecture that Meru provided, and that was something that we could understand really easily. We could deploy it on a large scale and we could support it. Meru just seemed to be the perfect fit at the perfect time,” said Smith. Today, the entire Meru wireless network is managed centrally by the equivalent of two full-time technicians.



*“Meru is our choice because it has the capacity, it is very innovative, and it meets our cost points.”*

– Javier Perez, Executive Director,  
Infrastructure Systems and Support

## A solution even better than it sounds

To prove the perfect fit, the district began with a limited deployment at one school—the Young Women’s Preparatory Academy. Occupying a three-story commercial building that had been taken over by the school board, the Academy offered a good test of the Meru single-channel architecture. Douglas Galbraith, supervisor of Infrastructure and Support, describes the pilot deployment this way:

“It sounded good and it works even better. We put up access points where we felt we needed to have them. Nothing interacted and everything worked. Wherever there were weak spots, we just added another access point. Because all access points are on the same channel, there was no co-channel interference.”

Adds Smith, “Meru passed our test. There was no significant engineering cost to implement or change the network.”

## 20,000 access points and still growing

The wireless network will always be a work in progress, as both device technology and pedagogy evolve. The district started with a hybrid wireless network, putting wireless hotspots in areas where students gather in large concentrations, such as auditoriums and the cafeterias, and moving to pervasive wireless in all the classrooms as funding became available. To date, 20,000 Meru access points are up and running, supporting 400,000 users and 397 schools.

“We plan eventually to move to 802.11ac technology, but we’re not at a point where we feel we want to be on that leading edge. We want to make sure the ac environment is stable enough to support what we see moving forward. We’re doing it the proper way,” says Karcher.

The Meru technology gives the district this flexibility to scale the network at its own pace, without costly re-engineering as they go.

## The wireless foundation for the future

With a fast, reliable wireless infrastructure in place, the wired network is on its way out in M-DCPS. “We plan to move all deployments over to a wireless platform. That includes Voice over IP to reduce telecommunications costs. Once our Meru wireless network is pervasive enough, we will add on different channel layers and run everything across the wireless network,” says Perez.

## Transparent user experience

In addition to reliable connectivity for everyone, a transparent user experience is high in priority at M-DCPS. “We feel it’s really, really important that we give a very transparent experience to our users,” says Karcher. “We have people travel among our different locations. When they walk into a school, we want them to use the same I.D. and access in all the schools so it really looks like one big wireless network for us. And that is something we’re working on now on implementing with Meru Connect.”

## A phenomenal partnership

In the Miami-Dade County Public Schools, the wireless network means more than the technology. It enables the vision of a connected community and equal opportunities for all its children. “Meru is a strategic partner for us,” says Karcher. “The network we are building together is required for virtual classes, computer based testing, and all the visual content that we’re going to be using into the next decade. This relationship goes beyond just providing infrastructure. The future of our schools and our children are involved. We have put our trust in Meru.”

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## About Meru Networks

Meru Networks (NASDAQ: [MERU](#)) is a leader in intelligent 802.11ac Wi-Fi solutions, delivering uninterrupted user experience for education, healthcare, hospitality and enterprise. The Meru MobileFLEX architecture is designed to enable seamless roaming with traffic separation for critical applications, providing top performance and high capacity in high-density environments. For more information, visit [www.merunetworks.com](http://www.merunetworks.com) or email your questions to: [meruinfo@merunetworks.com](mailto:meruinfo@merunetworks.com)

