

# A Next-Generation Fan Experience

## TD Garden Arena-Wide Wi-Fi Deployment

### Executive Summary

When TD Garden—home to Boston’s legendary hockey and basketball teams—wanted to deliver Wi-Fi connectivity to tens of thousands of sports fans and concert goers, they needed a wireless network capable of delivering championship-caliber performance. That’s why they engaged the networking experts at PC Connection, Inc. Working closely with Cisco and TD Garden IT staff, the PC Connection team designed and built one of the most innovative stadium Wi-Fi solutions in the industry.

### An Engaging, Interactive Fan Experience

TD Garden’s existing network couldn’t provide the access they needed to support the facility’s wide range of events and services. A Wi-Fi network offered some coverage for offices and vendor shops, but the main area had limited connectivity for fans who came to enjoy hockey and basketball games, concerts, or headline acts. TD Garden wanted to build a platform that would engage guests and deliver an interactive experience that enabled them to get the most out of their visit.

Complementing TD Garden’s recent deployment of a Cisco StadiumVision video and digital content distribution solution, a new facility-wide Cisco Connected Stadium Wi-Fi solution would help fans experience their favorite teams and artists in greater depth. It would also serve as a way for TD Garden to learn more about the features and services that visitors wanted. Using digital signage, interactive directories, and powerful analytic tools, TD Garden could learn how guests moved through the venue and what they were looking for. The wireless network had to enable the next-generation technologies TD Garden wanted to deploy today, and the innovative services they wanted to offer down the road.

### Out-of-Sight Performance

Beyond providing a better fan experience and reliable, high-speed performance, the new Wi-Fi solution had to stand up to physical demands of the multi-use stadium. In any given week, the venue could host a hockey game, a basketball game, or a major performing artist. Whether a parquet floor went down, a stage went up, or ice covered the arena, the Wi-Fi had to perform flawlessly and deliver 100% coverage to every seat in the house. And, as with any public space, the entire network infrastructure had to be hidden in plain sight—preventing costly damage to equipment and preserving open, unobstructed views of that night’s entertainment.

### Call in the Experts

While TD Garden’s extremely knowledgeable IT staff knew what they wanted from their wireless network investment, they didn’t have the in-house resources to tackle some of the unique challenges associated with such a large-scale project. Engaging the PC Connection team for a baseline assessment helped them understand the capabilities and limitations of their existing network infrastructure and how the addition of wireless would affect performance. The team brought in battery-powered access points (APs) and a fleet of tools to

perform radio frequency analysis and test signal strength throughout the upper and lower levels of the arena, mapping obstructions and pinpointing problem areas row by row. Based on the results of PC Connection’s assessment and Wireless Site Survey, the team had the information they needed to create a Wi-Fi design that delivered the coverage and performance TD Garden wanted to provide for their guests.

### A Foundation for Success

Throughout the assessment phase, the PC Connection team collaborated closely with the customer to understand all of their requirements, concerns, and goals. The team evaluated TD Garden’s existing infrastructure and made recommendations for improvements in a phased approach. “Based on the analysis we did in our assessment, we identified a need for TD Garden to build out some of their access layer—their network switches—to support the wireless deployment,” said Tim Allen, Director of PC Connection, Inc.’s Networking Practice. “We worked with their organization to identify where there was a need for more robust switching technology, and how that technology would build out a capability for trunking, supporting the back end and the back haul to their core infrastructure.” This roadmap helped TD Garden understand how to progress from their current infrastructure through the adoption of an enhanced wireless solution, and how their network would support future expansion.

### Project Design with Unbeatable Attention to Detail

With firm deadlines for opening day of hockey season and booked concert dates, the deployment had to be flawless—and timed to perfection. Once the infrastructure was in place, the team didn’t have the luxury of taking APs down or changing plans midstream. The design had to be meticulously planned and thoroughly vetted before a single piece of equipment went in.

To ensure the entire project went seamlessly from start to finish, PC Connection’s experts collaborated closely with specialists from the Cisco Professional Services Team. “As a Gold Partner, we work tightly with Cisco on a lot of projects,” said Paul Carignan, Systems Engineer at PC Connection. “Their team was great to work with.” PC Connection’s investment in Cisco technologies, including a longstanding partnership, hundreds of hours of training, and dozens of certifications, ensured members of both organizations knew how to work together to best achieve the customer’s goals.

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## Creative Solutions to the Toughest Challenges

Working on the high level design together, the PC Connection and Cisco team carefully planned the location of more than 280 Cisco 3600 and 3700 Series Enterprise APs to maximize coverage without impacting the aesthetics of the arena. One of the toughest challenges was to provide Wi-Fi service in the lowest level of the bowl, right along the rink-side seats. The team came up with the creative idea of placing some of the APs inside the side walls of the hockey rink itself—an industry first innovation. The walls, known as dasher boards, kept the APs out of sight and protected them from harm with construction built to withstand body checks from professional hockey players. Combined with APs placed around the perimeter of the upper bowl, attached to the scoreboard, and hidden inside the basketball goal posts, the layout ensured Wi-Fi coverage throughout the stadium no matter what type of event was taking place.

## A Step-by-Step Plan for Success

Following an on-site walkthrough with the team, TD Garden approved the high level design, and the PC Connection experts moved on to planning the low level design. During this stage, the team produced detailed documentation that specified how each piece of equipment should be configured. The entire project moved forward in stepped phases, progressing from one area of the stadium to the next. During the first phase, the team completed Wi-Fi deployments in TD Garden's ticketing area, the concession and hospitality zones on the Level 4 and Level 7 concourses, and delivered a completely wireless handheld scanning and printing solution for point-of-sale transactions in the premium seating areas.

Phase 2 of the project tackled the massive guest wireless deployment, including both the upper and lower levels of the bowl as well as the suite areas. Following the installation of Cisco controllers and 3600 and 3700 Series Enterprise APs, Cisco's innovative management interface enabled the team to fine tune power settings with amazing results. "The tools that Cisco brought to this capability gave us the ability to literally—with their heat maps and control systems—watch how the radio frequencies were moving and permeating through the facility," said Tim Allen. "We could actually widen or narrow the coverage in order to see the best performance for radio frequencies and to achieve the signal strengths that we had set as our goals." The team crisscrossed the entire stadium during a post-installation Wireless Site Survey, measuring coverage again row by row and adjusting APs until the heat map showed even coverage throughout every section of the public space.

## Exceptional Support From Start to Finish

After the initial deployment, PC Connection's job was far from done. The team conducted stress tests during pre-season games, sending staff to support TD Garden's IT organization

as they saw how their wireless network performed under real-world conditions. As the building filled with people, and their mobile devices interacted with the network, the experts tweaked settings to ensure trouble-free operation. Utilizing Cisco CleanAir technology, the team was able to reduce RF and co-channel interference and optimize signal performance so that users could roam the facility freely while enjoying consistent, high-quality connectivity on their mobile devices.

## PC Connection and Cisco: A Winning Partnership

PC Connection's project management capabilities and in-depth understanding of Cisco technologies were major factors in the successful completion of the deployment. As a Cisco Gold Partner, PC Connection had the in-house expertise, training, and resources to maximize the return on TD Garden's networking investment. "Cisco has done a lot of work with us, and they are very confident in what we do—what we say we can do, and what we can actually do," said Joyce Gilman, Project Manager at PC Connection. "They know our engineers well at this point, and they are confident in them. They speak to each other. We've built a relationship with them." The project team drew from the expertise of PC Connection's Networking Practice and Cisco's Professional Services, with engineers from both organizations working side by side to deliver the best possible outcome for the customer. "It's a mutual respect for each other's organizations," said Allen, "We have a great bond working with Cisco."

## Technology that Drives Teamwork

PC Connection's hard work identifying, testing, and fine tuning AP placements ensured everyone got a strong signal on game night. In addition to forging a deeper connection with fans, the Wi-Fi coverage across the basketball court meant that players and coaches could get instant feedback on the sidelines from team experts watching from the booth above. The combination of strong Wi-Fi and convenient handheld scanners and printers also revolutionized workflow for busy servers in the premium seating areas. Instead of taking orders and running back to place them at a central order station, workers could now complete the transactions tableside, giving customers faster service and a more enjoyable dining experience. Based on the results of the project, TD Garden has already engaged PC Connection on the next phase of their networking initiative: modernizing and expanding their fiber deployment to add resiliency and redundancy to their infrastructure. Game on!

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