Cisco Connected Stadium Wi-Fi Solution

The Cisco Connected Stadium Wi-Fi solution delivers high capacity and blanket coverage throughout a stadium to support a mix of back-office and fan access applications. The solution extends the stadium's network using new and proven Cisco products and technologies in a unique design.
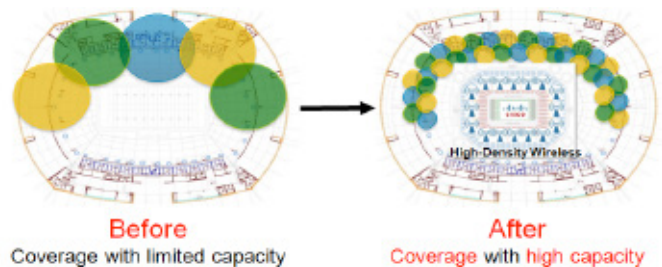
Cisco has designed and deployed Connected Stadium Wi-Fi networks in some of the largest stadiums in the world. From these projects, our team of experts has developed a deep understanding of how to meet the many challenges of building wireless networks in these venues. The Cisco Connected Stadium Wi-Fi solution:

· Supports the demanding access and security requirements of the different Wi-Fi networks used in venues, such as Point of Sale, Ticketing, Business Management Systems, Guest and Contractors, Special Events, and Internet and walled garden access for fans

· Optimizes the capacity for all client devices

· Meets the stringent aesthetic requirements of stadiums

· Overcomes the radio frequency (RF) interference often introduced by wireless devices brought in for special events

· Provides system-wide features for securely managing hundreds of access points and thousands of users

· Seamlessly integrates with other Cisco Sports and Entertainment solutions like the Cisco StadiumVision Mobile solution which delivers live video to the Wi-Fi devices of thousands of users in the venue.

To address these needs, the Cisco Connected Stadium Wi-Fi solution employs new, highly directional antennas and high-performance, dual-band access points along with software algorithms to automatically tune the wireless network to the constantly changing RF environment and CleanAir technology, which includes access points with integrated, silicon-level spectrum intelligence that detects, classifies, and mitigates RF interference. For network management and visibility, the solution includes feature-rich WLAN controllers and the Cisco Prime Infrastructure management software.

The Cisco Connected Stadium Wi-Fi solution uses advanced radio resource management (RRM) features and high-gain antennas to deliver hundreds of micro Wi-Fi cells throughout a venue, with each cell supporting high capacity and a diverse set of WLAN devices. As shown in Figure 1, this tighter packing of micro Wi-Fi cells makes it possible to support a greater number of data users.

Figure 1. Improving Coverage and Capacity with Cisco Connected Stadium Wi-Fi

Successful deployment of this solution requires:

· A comprehensive assessment to understand the needs and challenges that are unique to each venue

· Careful planning to help ensure an adequate number of access points and their correct placement to support the required capacity

· An understanding of deployment best practices to securely integrate any existing wireless networks that may be present in the stadium

· Fine-tuning of access point channel assignment and RF power levels during implementation to help ensure proper coverage

Cisco Connected Stadium Wi-Fi Solution Data Sheet

Cisco Advanced Services offers a range of services for the Cisco Connected Stadium Wi-Fi solution to support you from the assessment and planning stages through deployment and tuning. Using their experience in implementing the solution at multiple stadiums, the Cisco Advanced Services team of venue specialists provides unmatched experience in assessing, designing, deploying, and tuning this comprehensive Wi-Fi solution.

Cisco Connected Stadium Wi-Fi Solution Benefits

The Cisco Connected Stadium Wi-Fi solution is designed to address the unique challenges of providing comprehensive WLAN coverage in sports and entertainment venues. Specifically, the solution addresses the need for wireless fan access within the venue "bowl." Fans at these events are the most challenging user group to accommodate considering the high density of users, the openness of the area, and physical challenges of placing WLAN access points in the bowl.

The results benefit the fans, the league, the cellular service provider, and the sponsors and advertisers.

- **Benefits for fans:** Fans now have reliable access to an increased array of data applications that work well over a high-capacity wireless network. In addition, due to the data offload, voice and text services are improved.
- **Benefits for the league:** With the improved coverage and capacity, clubs and leagues have expanded options for creating more engaging mobile applications to enhance the fan experience. Clubs and leagues can provide access to exclusive, in-venue, experience-enhancing applications for way-finding, food and beverage purchase, and more.

- **Benefits for service providers:** Because the 3rd Generation/4th Generation (3G/4G) network is no longer burdened with bandwidth-hungry data applications, voice calls and texting work again, eliminating the customer complaints often heard by service providers regarding the use of cell phones in this type of demanding environment.
- **Benefits for sponsors:** Previously, because of bandwidth challenges, it has often been difficult to deliver effective advertisements on smartphones in the venue. However, with the Cisco Connected Stadium Wi-Fi solution, sponsors and advertisers can extend their reach beyond the big screen and the displays in the concourses. No longer will smartphones freeze after only half of the advertisement image is downloaded.

Cisco Connected Stadium Wi-Fi Solution Components

The foundation of the Cisco Connected Stadium Wi-Fi solution is Cisco Connected Stadium, a single connectivity platform for sports and entertainment venues that enables innovative engagement models and enhanced fan experiences, as well as new revenue growth opportunities.

The components that make up the Cisco Connected Stadium Wi-Fi solution have been carefully selected and tested to ensure that the solution provides the sports venue with adequate wireless LAN coverage and capacity. When deployed correctly, the solution helps provide fans in the venue with reliable wireless access, including good voice and text service. To provide their validated benefits, it is important that the design and the selected components meet the approved Cisco Connected Stadium Wi-Fi design best practices.

Cisco Connected Stadium Wi-Fi Solution

Table 1 outlines the components of the Cisco Connected Stadium Wi-Fi solution.

Table 1. Cisco Connected Stadium Wi-Fi Solution Requirements

Category	Product	Function
Access Points	Cisco Aironet® 3502p Access Point (with external antennas)	Used for bowl seating and other high-density areas that require the Cisco High-Gain Stadium Antenna.
	Cisco Aironet 3502i or 3602i Access Point (with internal antennas)	Used for low-density coverage in carpeted areas, clubs, and suites where an access point can be mounted on ceiling tile.
	Cisco Aironet 3502e or 3602e Access Point (with external antennas)	Used in carpeted areas, clubs, and suites where external antennas are required.
Antennas	Cisco Aironet 2.4- and 5-GHz High-Gain Multiple-Input Multiple-Output (MIMO) Stadium Antenna	High-gain, directional patch antenna used for bowl seating and other high-density areas. Used with 3502p.
	Cisco Aironet 2.4-GHz MIMO Patch Antenna	Directional patch antenna used in clubs and medium-density concourses. Used with 3502e.
	Cisco Aironet 5-GHz MIMO Patch Antenna	Directional patch antenna used in medium- and high-density areas, including clubs, concourses, and bowl areas. Used with 3502e.
	Cisco Aironet 2.4 and 5-GHz MIMO Patch Antenna	Directional dual-band patch antenna used in clubs and medium-density concourses. Used with 3602e.
	Cisco Aironet Dual-Band MIMO Omnidirectional Antenna	Omnidirectional antenna used in carpeted areas, suites, and other low-density settings. 3502e and 3602e have their own antenna versions available.
Wireless LAN Controllers and Management Systems	Cisco 5508 Wireless LAN Controller or Cisco Wireless Services Module 2 (WISM2)	Wireless LAN Controllers act as a centralized aggregation point for access point control. There are two options; 5508 Standalone appliance and an integrated Service Module for the Cisco Catalyst 6500 switch.
	Cisco Prime Infrastructure	Used for centralized management of wireless system.

Cisco Connected Stadium Wi-Fi Solution

Cisco Services for the Connected Stadium Wi-Fi Solution

You can realize the full business value of your Cisco Connected Stadium Wi-Fi solution investment with smart, personalized services from Cisco. Cisco Services for the Cisco Connected Stadium Wi-Fi solution incorporate assessment, architecture planning, solution design, and implementation services. These services are designed to help facilitate a smooth deployment and ongoing maintenance of the solution, including hardware coverage and software upgrades.

For more information about Cisco Services for the Connected Stadium Wi-Fi solution, please contact your local Cisco account manager.

Cisco Connected Stadium Wi-Fi Solution Specifications

Table 2 lists the specifications of the Cisco Connected Stadium Wi-Fi solution.

For More Information

For more information about the Cisco Connected Stadium Wi-Fi solution and the benefits it provides, please visit http://www.cisco.com/go/sports or contact your local Cisco account representative.

Table 2.   Cisco Connected Stadium Wi-Fi Solution Specifications

Features and functions	- Support for 802.11 a/b/g/n - Wide variety of 2.4- and 5-GHz access points and antennas - Specialized hardware, such as a stadium-grade antennas and custom chips in the access point for spectrum analysis - Cisco BandSelect technology for encouraging devices to use the less crowded 5-GHz band - Cisco CleanAir technology for continuously monitoring the RF environment to automatically optimize the wireless coverage and mitigate RF interference and service clients simultaneously - Cisco VLAN Select feature for grouping VLANs to accommodate very large pools of Wi-Fi devices - Cisco ClientLink technology to improve the uplink and downlink performance of 802.11a/g clients - Cisco radio resource management for systematically managing access point channel assignment, power levels, and other tasks required to optimize the performance of the Wireless network - Seamlessly integrates with the Cisco Connected Stadium network and management platform for guaranteed interoperability and efficient operational support - Specialized multicast feature set to deliver streaming video to the scale required for Sports and Entertainment properties

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

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