

WI-FI ACCESS FOR ALL IN STADIUMS



The stadium of the future will need to deliver a complete multimedia viewing experience for fans with smartphones and tablets, and that will require a much more robust network.

Consider what happened at Super Bowl XLVI in 2012. AT&T's cellular network handled a total of 215 Gigabytes of traffic during the event – a whopping five times higher than the previous year's Super Bowl. And AT&T was just one of four mobile carriers present.

Even with widespread coverage using special antenna systems and additional temporary towers, a cellular network is simply unable to accommodate this level of traffic volume. And this is why venue owners, carriers and managed service providers alike are looking to Wi-Fi to offload bandwidth-hungry video and data traffic from 3G and 4G networks.

Sports teams and venue owners know they need to deliver additional applications and services to enhance the in-person fan experience to fill as many seats as possible. Stadium applications, such as video replays and real-time statistics, coupled with amenities like in-seat food and beverage ordering, have become required amenities for a compelling fan experience.

In addition, venue owners need improved support for event operations like reliable high-speed press box Internet access, pervasive ticketing and point-of-sale transaction processing, digital signage, and video surveillance.

Resilient, high-performance WLANs from Aruba Networks address these stadium-wide Wi-Fi deployment and service challenges. Aruba offers a wide range of high-density Wi-Fi designs and proven access infrastructure, security and device onboarding technologies that scale without compromising performance, reliability or quality of service.

THE ARUBA ADVANTAGE

Aruba high-performance Wi-Fi access solutions are operating successfully in scores of the world's largest stadiums and sports arenas. There are many advantages to deploying Aruba in large public venues:

- Aruba's ClearPass Guest visitor management system gives fans a simple and secure branded Wi-Fi portal to access a variety of value-added services.
- Noise-aware, client-aware and application-aware, Aruba's Wi-Fi access architecture scales without compromising performance, reliability, quality, security or ease of management.
- A full range of access points (APs) that are purpose-built for high-density Wi-Fi client environments and outdoor wireless deployments.
- Without manual intervention, Adaptive Radio Management™ (ARM) technology optimizes the use of unlicensed spectrum to maximize RF coverage, capacity and Wi-Fi client performance.
- A stateful Policy Enforcement Firewall™ (PEF) utilizes contextual information to enforce the access privileges and restrictions for different users.
- Application-awareness automatically identifies and prioritizes the most important latency-sensitive traffic to guarantee the highest-quality user experience.
- AirWave™ network management offers centralized multivendor control and visibility into the entire wired and wireless infrastructure.

"A single Aruba Mobility Controller performs the tasks of more than seven other devices at about 25% of the cost. That's real value no matter how you look at it."

Joe Heinlein, Director of Information Technology
American Airlines Center

STADIUM WI-FI CHALLENGES

Tens of thousands of fans sitting side-by-side, row-after-row. Hundreds of employees, concessionaires and reporters roaming about. Bandwidth-hungry video and data applications. These are some of the reasons that providing Wi-Fi access in stadiums is so difficult.

Most Wi-Fi networks cannot scale in a stadium environment because they do not address the challenges of providing reliable, high-speed access to tens of thousands of users consuming copious quantities of bandwidth.

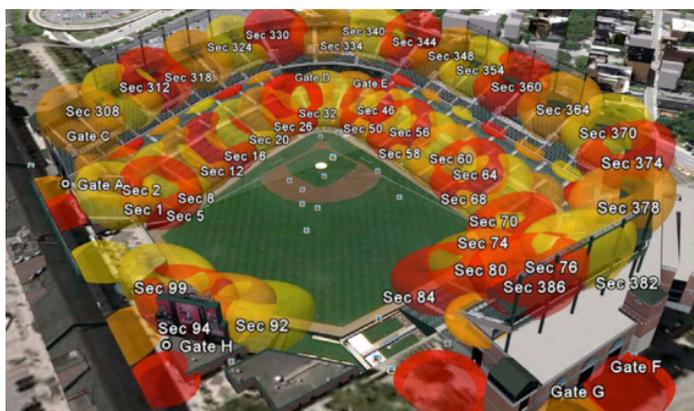
The underlying problem is Wi-Fi's limited RF spectrum. It must be managed constantly, transparently and effectively in a context-aware fashion to ensure that there is both complete coverage and adequate capacity.

The Wi-Fi network must support multiple classes of users running multiple applications. This requires an infrastructure that can differentiate services so that fans viewing instant replays or sending messages cannot interfere with critical applications like ticketing, digital signage and stadium security.

Simply put, only carrier-grade Wi-Fi provides the necessary RF coverage, capacity, secure guest access and simple, centralized management that ultra-high-density Wi-Fi deployments require. This solution must also be scalable enough to handle many thousands of mobile users and bandwidth-intensive multimedia applications.

THE ARUBA SOLUTION – WI-FI ACCESS FOR ALL

When it comes to Wi-Fi in ultra-high-density client environments, Aruba is unmatched in its technical knowledge and depth of experience. That makes Aruba the preferred Wi-Fi solution in stadiums and other large public venues around the world. Aruba's approach balances Wi-Fi client density with coverage, capacity and cost to provide operational simplicity and rewarding visitor experience.



Aruba WLANs deliver stadium-wide Wi-Fi coverage.

To optimize the configuration while ensuring maximum performance and cost-effectiveness, Aruba offers a formidable range of indoor and outdoor access points (APs), including models purpose-built for extremely high-density Wi-Fi client environments, and a portfolio of antennas that offer flexibility to guarantee the best RF coverage in any environment.



A picocell deployment beneath concrete stadium seating.

The use of closely-spaced picocells ensures the highest possible performance by limiting the number of users each AP must support, while blankets of separation minimize self-interference.

The Aruba solution includes resilient wireless mesh backhaul capabilities that enable the fast, efficient deployment of Wi-Fi for video surveillance and secure client access in parking lots and other locations that are difficult or impossible to wire. Aruba also offers power-over-Ethernet, making it easy to deploy Wi-Fi throughout any stadium.

Without proper RF coverage and capacity, fewer users will have access, and those who do will likely get poor service. This is why RF management is essential in stadiums and large public venues.

Aruba Adaptive Radio Management™ (ARM) is the most effective RF management technology available today for high-density environments. It automatically and continuously ensures that all Wi-Fi devices associate with the optimal AP at its optimal power setting and on the optimal channel.

ARM's airtime fairness algorithms ensure equal access for all devices, regardless of type, capability or operating system, while airtime performance protection prevents slower clients from monopolizing available bandwidth. Together these capabilities maximize the quality of service for all users, all the time.

Fans will appreciate just how easy it is to access value-added services via Aruba's intuitive ClearPass Guest access management system.

Scalable and intuitive, ClearPass Guest can be fully customized with your brand while supporting credit card billing, advertising, multilingual content, unique sales offers and more. Access is normally provided to a secure walled garden where fans can choose from a wide range of free and fee-based services.



Fans get network access through a ClearPass Guest registration screen.

The simplicity and affordability of having a single network for fans and employees – including concessionaires and contractors – requires some means of security.

Aruba's integrated Policy Enforcement Firewall™ provides stateful protection by constantly monitoring users and devices, along with their locations and the time of day, and uses this contextual information to enforce access policies. PEF also provides policy-based policy enforcement and supports multiple user categories on a single network, across the wired, wireless, and remote network infrastructure.

Context-awareness is also important to ensure a positive experience for all users by effectively managing the network traffic. For example, delay-sensitive voice and video traffic always gets priority treatment to ensure quality.

It is even possible to identify individual fans who are consuming too much airtime or bandwidth, including with peer-to-peer communications, and their sessions can be blocked or throttled back if necessary to ensure that other users nearby get their fair share.

To reduce the cost and complexity of network operations, Aruba AirWave™ provides centralized multivendor control and visibility into everything that affects service quality, including Wi-Fi coverage, APs, controllers and the underlying wired infrastructure.

AirWave also provides a suite of tools that improve efficiency and simplify management with robust RF security, user location and mapping, real-time monitoring, proactive alerts, historical reporting, and troubleshooting.

CONCLUSION

Aruba brings together the industry-leading technology, proven design best practices, and expert professional services needed to ensure the successful deployment of high-performance Wi-Fi access in stadiums, convention centers and other large public venues.

With a network access architecture that offers unmatched scalability, Aruba delivers the RF coverage, capacity, security and reliability needed to consistently deliver Wi-Fi services in any public venue.

"We couldn't have succeeded without the expertise of Aruba's professional services organization. Their dedication and knowledge is second to none."

Chris Yates, Chief Information Officer
Tennis Australia



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