A Global Leader in Industrial-grade Super Wi-Fi Solutions

Smart City Solution

Sep 2024

About Us

Altai globally empowers mission-critical applications with its trusted industrial-grade Altai Super WiFi™ solutions, boosting productivity and operational efficiency.

ALTAI
Super WiFi

Smart City Solution

Revolutionizing Smart City Management by
Altai Super WiFi™

Introduction

As cities around the world evolve into smart cities, the focus is on optimizing urban functions and improving the quality of life for residents. The integration of Artificial Intelligence of Things (AIoT) is transforming urban landscapes, making them more automated, efficient, and transparent. In this context, Wi-Fi becomes essential, serving as the backbone of a smart wireless network that connects various smart devices across the city. Altai Super Wi-Fi provides an industrial-grade solution tailored for urban environments, offering high-speed, secure connectivity that enhances smart city applications while reducing the number of access points needed, all without sacrificing reliability.

Requirements

Complex and Challenging Environment

- Urban cities are characterized as a forest of concrete, creating a non-line-of-sight environment for Wi-Fi deployment. Buildings can greatly obstruct wireless signals, limiting the effective coverage. The Wi-Fi networks must be strategically designed and planned to optimize the coverage.

High Density of Smart Devices and Users

- Wi-Fi networks must cater to both human users and an extensive array of smart devices. The access points (APs) and backend infrastructure are required to accommodate this high volume of connections.

Seamless Roaming

- With APs distributed across the city, seamless roaming is essential, especially for mobile applications such as pedestrians and vehicles.

Security and Privacy

- Given the multitude of devices connected to the network, safeguarding data from malicious users is important. Wi-Fi transmissions must be encrypted in compliance with the latest industry standards to ensure user privacy and prevent data leakage.

Noise and Interference Handling

- Interference from other Wi-Fi access points or non-Wi-Fi radio systems operating on overlapping frequency bands can adversely affect access point performance. Therefore, it is essential to conduct a thorough site survey and implement careful channel planning across the sites.

Centralized Management

- To effectively manage a network comprising a large number of APs deployed across the city, a centralized WLAN controller is necessary. This will facilitate streamlined administration, monitoring, and maintenance of the network.

Why Choose Altai

Super Wi-Fi Coverage by Altai Smart Antenna Technology

- Thanks to Altai’s patented antenna design and advanced signal processing algorithms, the Altai solution effectively addresses significant Wi-Fi bottlenecks and enhances uplink performance in non-line-of-sight (NLOS) environments. This optimization reduces the number of access points required, thereby lowering both capital and operational expenditures.

Long Range Wireless Bridge

- The Altai Super Wi-Fi solution enables access points (APs) to connect over distances of hundreds or even thousands of meters. This stable and robust wireless link supports high traffic volumes while minimizing the number of AP nodes, resulting in decreased capital and operational costs.

Secured Wi-Fi

- Altai’s solution ensures security for both wireless and wired links. Wi-Fi traffic data is secured using WPA2/WPA3 encryption. These data traffic is guarded by sophisticated CheckPoint Next-Generation Firewall (NGFW) embedded in a network controller. It automatically identifies and blocks malicious users or applications.

Made for Industrial Grade Solutions

- Altai's access points are built with durable hardware designed to withstand outdoor weather conditions, ensuring uninterrupted 24/7 operation.

Application – 1) Public Wi-Fi

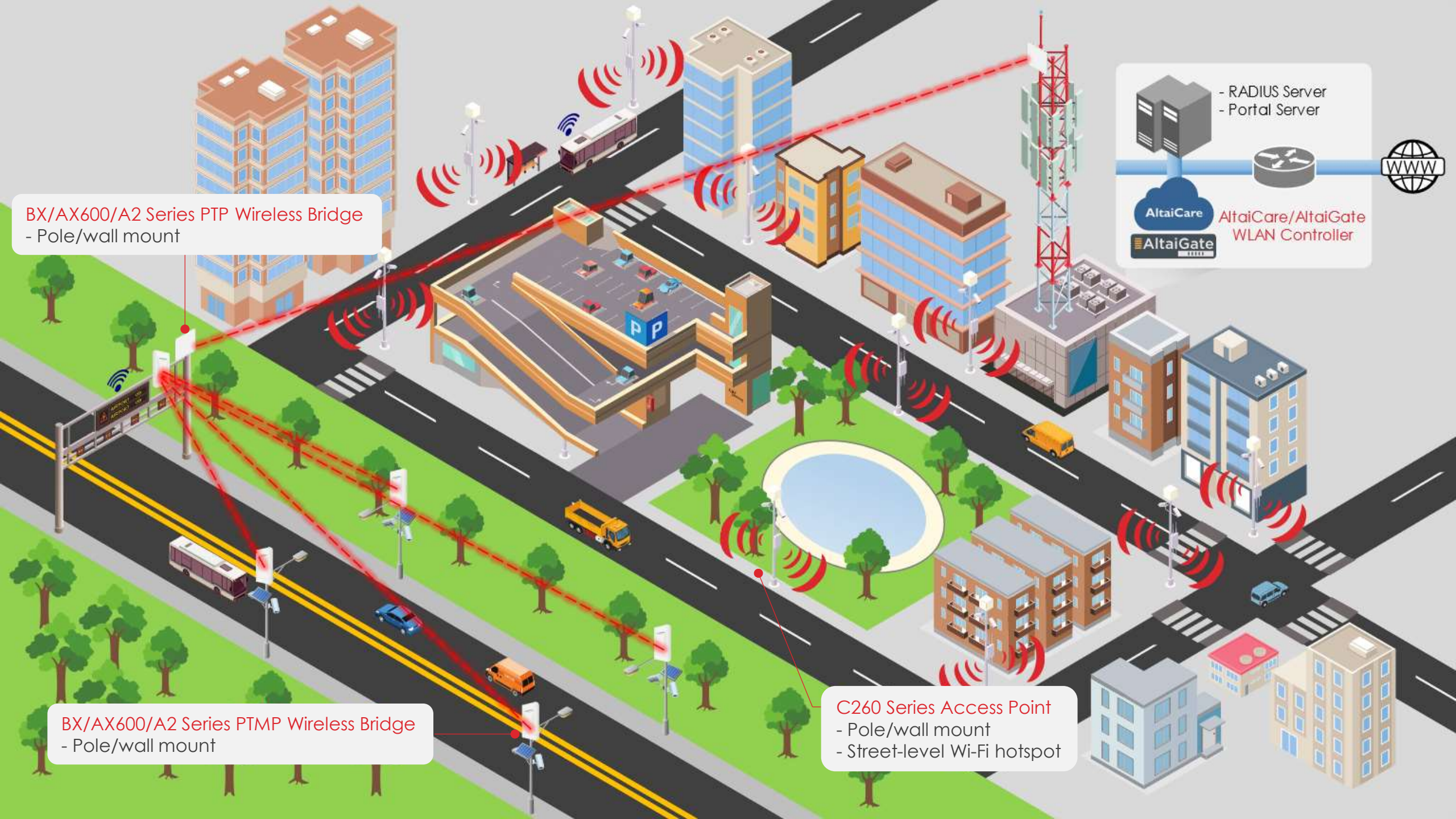
The complex layout of urban environments, characterized by numerous streets and alleys, corridors. Such a non-line-of-sight environment poses challenges in providing comprehensive Wi-Fi coverage as radio frequency signals experience significant loss during propagation. As a result, the deployment of public Wi-Fi will primarily occur in hotspot modes in high internet traffic areas such as parks, town squares, and tourist attractions.

It is recommended to install Altai access points (APs) on high ground like building rooftops, lamp posts, with adjustable down-tilt antenna to shoot to the target coverage areas. The APs can be interconnected via wired or wireless backhauls to incorporate into a MAN for Internet access. To provide coverage within public transport, Customer Premises Equipment (CPE) can be installed as a wireless anchor with 5GHz wireless backhaul to the network infrastructure, and at the same time providing Wi-Fi connectivity onboard for passengers.

Application – 2) AIoT

Connectivity serves as a critical component of an AIoT infrastructure. Typically, data collected from IoT sensors are transmitted to a computing unit for AI processing and subsequently sent to a central management platform for remote monitoring. In scenarios where cabling is impractical, Wi-Fi acts as the intermediary node, facilitating the integration of various smart applications throughout the city. For example, AI cameras can capture and analyse traffic conditions, enabling real-time traffic control measures. Additionally, these cameras can be employed for facial recognition, helping authority to maintain public safety. Sensors integrated into utility infrastructure, such as streetlights, water plants, and waste bins, monitor usage and health status, optimizing energy efficiency and minimizing service disruptions.

Altai provides a range of connectivity solutions for AIoT applications. Altai access points can be deployed on elevated structures to establish Wi-Fi coverage for IoT sensors. For applications requiring high bandwidth and low latency, such as AI cameras, the Altai TDMA point-to-multi-point solution is ideal. A single TDMA base station can connect to multiple TDMA subscribers located near AI cameras, forming a stable wireless connection for the transmission of video data. APs within the same vicinity can be monitored through a remote controller, facilitating Wi-Fi network management.


BX/AX600/A2 Series PTP Wireless Bridge
- Pole/wall mount
- RADIUS Server
- Portal Server
AltaiCare
AltaiGate
AltaiCare/AltaiGate
WLAN Controller
WWW
BX/AX600/A2 Series PTMP Wireless Bridge
- Pole/wall mount
C260 Series Access Point
- Pole/wall mount
- Street-level Wi-Fi hotspot

Recommended Solutions

AP Models:

- AX600-S/A3-Ei (Pole/Wall mount type suitable for large outdoor coverage)
- CX600/M360-X/VX200 (Wall mount type suitable for onboard coverage in public transport)

TDMA Base Station Model:

- BX750-S (Pole/Wall mount type suitable for high bandwidth requirement)
- BX700-S (Pole/Wall mount type suitable for medium bandwidth requirement)
- BX600-S/ BX600-X (Pole/Wall mount type suitable for low bandwidth requirement)

TDMA Subscriber Model:

- BX270-N / BX270-X (Pole/Wall mount type suitable for high bandwidth requirement)
- BX260-N / BX260-X (Pole/Wall mount type suitable for low bandwidth requirement)

PoE Switch:

- MIS120P/MIS200P

WLAN Controller:

- AltaiCare On-Prem/ AltaiCare Cloud/ AltaiGate

Applicable Features:

- Fast Roaming
- Auto channel selection
- VLAN
- Captive portal
- Multi AP steering

Free Wi-Fi Network Enables Various Applications Development

Customer Name: Hong Kong Science Technology Park Welfare Electronic Component Ltd. (Distributor)

Deployment Location: Hong Kong

Application: Free Wi-Fi network

Products used: Altai A3-Ei

Result: visitors The new Wi-Fi network has significantly increased the network usage due to its stability and coverage size. At peak, the maximum number of concurrent users is over 500 users. With free Wi-Fi access, the park tenants can test their mobile applications around the park. Park can also check the park information through the free wireless network.

Read more here.

Perfect Wi-Fi Coverage for Large Venue

Customer Name: ExpoISP Implemented by Kubos Deployment

Location: Santa Marta, Colombia

Application: Free Wi-Fi network for visitors

Products used: IX500

Result: Kubos' deployment of Altai Super WiFi™ at ExpoISP allowed all participants of the show to enjoy free internet access via stable and robust Wi-Fi network that was powered by Altai's IX500 dual-band AP.

Read more here.

ALTAI Super WiFi

Thank you.

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