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Alcatel-Lucent Enterprise's PIA Inquiry of Geolocation for 6GHz Access Points

Geolocation General Description

The following is a general description of how Alcatel-Lucent Enterprise's wireless access points (APs) acquire location information and maintain a confidence level of at least 95% in the accuracy of said location information when under the control of an Automated Frequency Coordination (AFC) system.

Location Acquisition via Hardware Interfaces:

To provide accurate location information to AFC systems, Alcatel-Lucent Enterprise's wireless APs capable of transmitting at standard power limits in the UNII-5 and UNII-7 bands are equipped with GNSS receivers. The APs self-locate using the GNSS receiver and report their geolocation at regular intervals to the wireless controller. The GNSS module can decode signals from GPS satellite systems to achieve a position fix.

The APs continuously collect satellite positioning data through their built-in high-precision GNSS receivers and store these raw coordinates along with dynamic updates in a specially designed circular buffer database. This database employs an advanced Last-In-First-Out (LIFO) storage management mechanism, when new coordinate data is written, the system automatically overwrites the oldest historical records to ensure efficient storage utilization.

The system defaults to a 95% confidence ellipse, meaning there is at least a 95% probability that the AP's actual location falls within this elliptical area.

Fallback Positioning Solutions

When Alcatel-Lucent Enterprise wireless APs cannot acquire valid signals due to obstructed GNSS visibility or weak GPS signals, the system activates an intelligent fallback positioning mode. The wireless controller then estimates the AP's location based on neighboring APs within the same network, primarily using Received Signal Strength Indicator (RSSI) technology.

The wireless controller estimates distances to neighboring APs with known locations and incorporates these values into the uncertainty range of the target AP. Under cloud controller management, confidence levels are determined solely based on the major axis of the ellipse, with the uncertainty area moderately expanded to maintain a minimum 95% confidence standard.

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Additional Information on Software-Based Location Handling Enhancements

Alcatel-Lucent Enterprise's wireless controllers track the AFC response expiration time for each AP and initiate new requests before expiry. Each AFC request is submitted in the format defined by the Wi-Fi Alliance's AFC Device Interface Specification, including updated location information.

When the system detects changes in AP location information—whether from automatic GNSS updates or manual adjustments by administrators via the web interface—it triggers a multi-tiered verification process. A new AFC request is initiated, and the AP dynamically adjusts its channel/power plan based on the latest AFC instructions.

In scenarios where an AP reboots, the system activates a conservative operating mode:

The AP have their 6GHz radio modules disabled entirely until valid positioning data is reacquired and a new AFC request is issued to restore standard-power operation.

Manual Elevation Entry Specifications

The installation height of Alcatel-Lucent Enterprise wireless APs will be manually entered by certified installers via a web interface or command line. Installers are required to input both the height value (Above Ground Level, AGL) and its uncertainty (meter-level precision).

This elevation entry feature is restricted to professional installation scenarios. Due to the unique frequency band characteristics of these APs, standard-power APs cannot be installed by end users. Additionally, accessing AP configurations requires managed accounts with robust security measures.

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APPENDIX A-Glossary

AFC= Automated Frequency Coordination

AGL = Above Ground Level

AP = Access Point

GNSS = Global Navigation Satellite System

GPS = Global Positioning System

RSSI= Received Signal Strength Indicator