

## New Generation Home Wi-Fi Management

### Remote Network Management of AirTies Managed Wi-Fi Solution

**Remote Manager** is a **cloud based** monitoring solution for Service Providers capturing network devices (Mesh Extenders, wireless and wired clients) analytics and Wi-Fi network performance metrics into an intuitive and powerful browser based graphical interface.

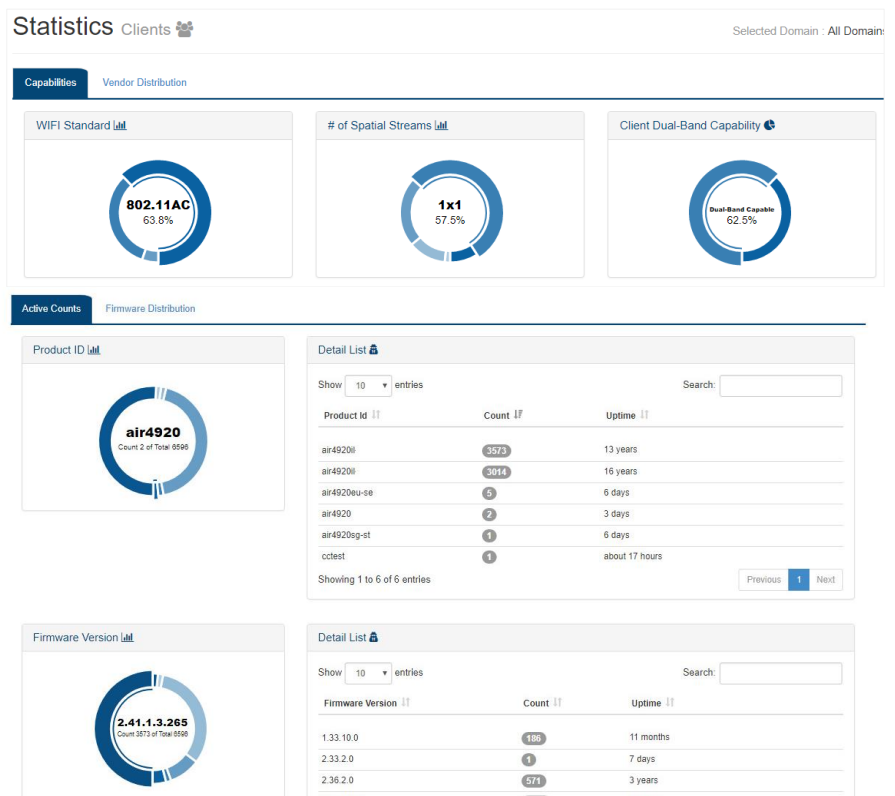
**Remote Manager** helps **Service Providers**, deploying AirTies Managed Wi-Fi Solution, to troubleshoot and pin point in-home Wi-Fi issues.

It can also be integrated into customers' back-end system through use of **AirTies Application Programming Interface (API)** to serve call center agents and field technicians for mass deployment.

**Remote Manager** logs Home Wi-Fi **network topology** for future reference (i.e. viewing, diagnosis, troubleshooting and reporting) with a geographical view. Targeting call-center agents for **troubleshooting**; and product teams for improved decision making based on **analytics and reports** generated.

### Intended Use Cases and Benefits

- **Fine tuning and in field optimization** of in-home Wi-Fi performance based on statistical and historical data
- In-field monitoring with large set of clients and topologies addressing wider **interop and coverage issues**
- Data **based assessment** of deployment success and **business intelligence (BI)**
- **Setting notifications and sending alerts** to relevant teams
- **Troubleshooting and support**; address customer complaints during support calls
- **APIs for integration** into Service Provider own First Level support tools
- **Pro-active management**, identify customer in-home Wi-Fi issues before the customer, such as interference, disconnected Mesh Extender or misbehaving client
- **Live View and Controls**; real-time remote monitoring, diagnostics and management of devices
- Home Wi-Fi health **check and reporting**
- **Co-existence** with ACS and TR069



## Mesh Extender Provisioning and Zero-Touch Installation

**Provisioning process** involves **registering** AirTies Mesh Extenders to the Remote Manager Platform, allowing them to be **auto-activated** and **auto-configured** at installation time in a secure and effortless manner.

**Provisioning** can be done at the **Warehouse** (pre-installation) or at the **Customer Premise** (during installation) leveraging the Remote Manager GUI, Mobile apps or directly the Cloud APIs and **QR code scanning** on the packaging (Customer, Technician or Warehouse).

Coupled with AirTies Live Controls infrastructure and Wi-Fi Alliance's Device Provisioning Protocol (DPP), Service Provider can offer a **Zero-touch Mesh Extender installation experience** to the Customers.

**AirTies Mesh Extenders** may be **re-provisioned, de-provisioned** as well for factory-defaulting, replacement and **refurbishment purposes**.

## Data Collection and Analytics Services for Home Wi-Fi

**Data collection and Analytics Services** involve periodic capturing of configuration, Wi-Fi activity and relevant performance data from AirTies Mesh Extenders, while sending it to the AirTies **Remote Manager** Platform for processing and analysis.

**On Demand Analytics** for specific home provides insight on historical and near real-time topology, configuration, performance and health of that Home Wi-Fi.

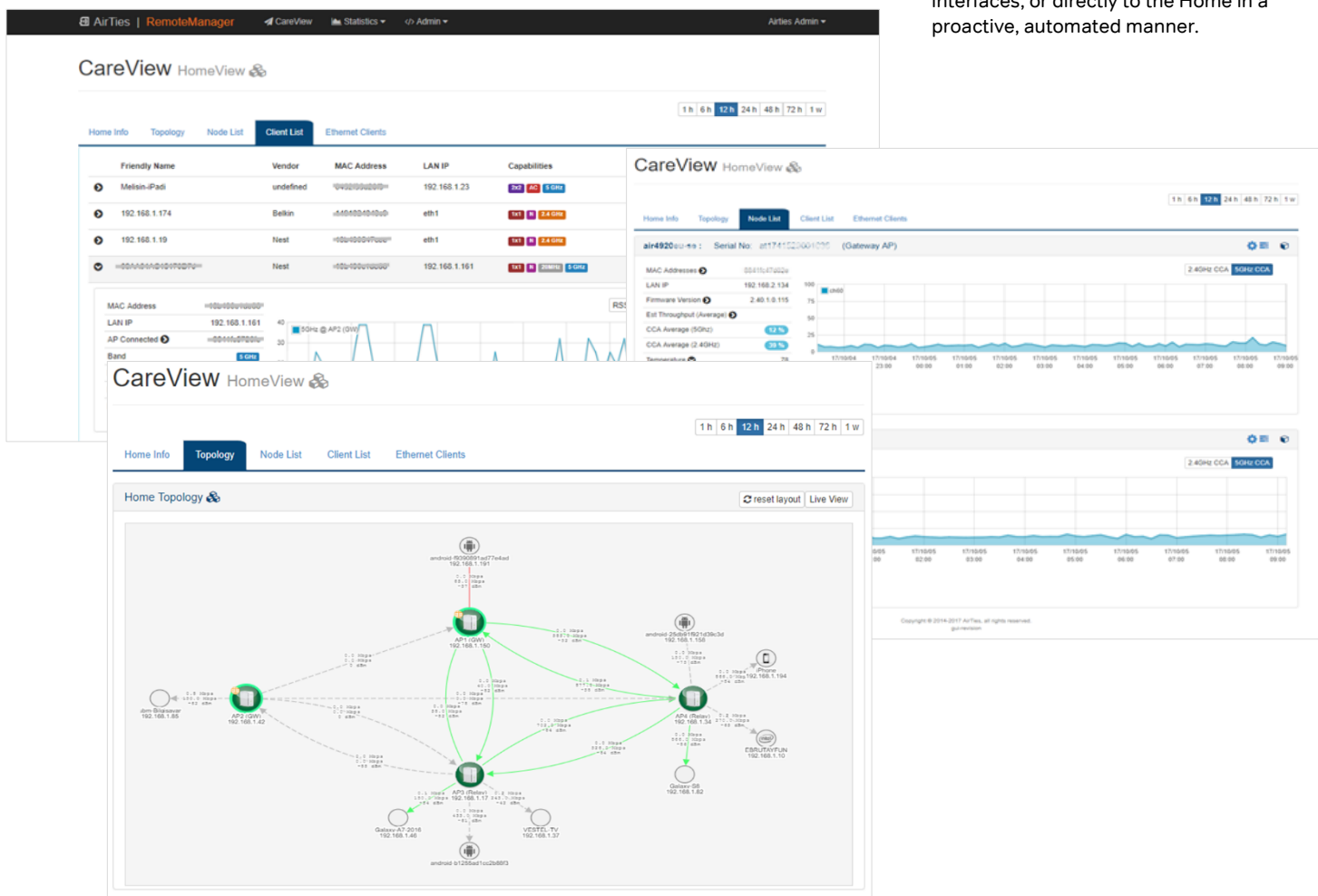
**Notifications** of different level and priorities will be raised by the Remote Manager based on certain conditions and Wi-Fi event activity within the Home. Notifications could be related to the Mesh Extenders, Wi-Fi environment or clients connected. There are two types of notifications: **Warning and Alarms**.

**Population analytics** – for the whole install base provide daily and historical key statistics on Mesh Extenders and Wi-Fi client devices, technologies, Mesh activities and key performance metrics.

**Ad-hoc reporting** capabilities offer pre-defined, out-of-the-box report generation and export functions, as well as customizations on them for the same data and more (e.g. deployment, sales, upgrade, etc. activities.) for Service Providers.

**Proactive analytics** facilitating a scalable, cloud-based, dynamic home Wi-Fi optimization mechanism, involves real-time, continuous processing of live and historical data collected from a particular home, as well as execution of selected, advanced analysis algorithms on this data.

Allows **Remote Manager** to dynamically predict or determine optimum Wi-Fi and Mesh parameters for that home, generate Real-time notifications to take action, and offer integrated systems the option to apply the suggested optimizations manually through Remote Manager interfaces, or directly to the Home in a proactive, automated manner.



## API (Application Programming Interface) Integration

The AirTies Remote Manager Cloud APIs, facilitating upper layer service applications and integration interfaces to be built, internal or external to the platform, provide a public, single point of entry for these applications to access, monitor and manage the functionality and respective data within the Platform. Remote Manager Cloud APIs are a large set of secure, stateless **RESTFUL resource APIs**, organized as groups of related functions, such as:

- Authentication and Authorization
- Home Level Wi-Fi history statistics/analytics
- Entire Population Wi-Fi history statistics/analytics
- Access Point Provisioning
- Real-Time (Live) Access Point View and Controls
- Firmware Management
- Raw Data access
- System Administration

Equipped with a secure authentication and authorization mechanism, access to the API groups are restricted through one or more role-based access control assignments to Users and Applications:

- Care agent (RW or RO)
- Provisioning
- Executive
- Engineering
- Technician/Installer
- System Admin

## Real-Time Live View and Controls

**AirTies Remote Manager** Live View and Controls features are built on top of a secure, message communications infrastructure and set of software components between the Mesh Extenders and Remote Manager Applications:

- Bi-directional, peer-to-peer messaging path to devices in real-time
- Secure, encrypted transport end-to-end
- Scalable infrastructure

Remote Manager Live Control features include, but not limited to:

- **AirTies Device Management** Data Model and associated parameter and event definitions
- **Parameters:** Configuration/State values or commands supported (e.g. Mesh Extender name, SSID/Password,

- **Events:** Asynchronous Real-Time Device Events/Alarms/State Changes emitted to the Cloud (e.g. High-priority events)
- **Direct, Real-Time access** to Access Points through Cloud APIs to query (live configuration and state view), and control (set configurations, issue commands) supported device parameters
- **Live Mode**, enabling temporary live monitoring of Mesh Extenders through the Cloud APIs

## Scalability and High Availability

Remote Manager is designed to support large and small scale deployments. There is no limitation on the number of Mesh Extender connected. Components are built as **Microservices**, deployed as cluster, independently deployable, small, modular services to support scalability.

Both **AWS Horizontal scaling** and **Auto Scaling** are supported. If required Remote Manager can utilize **multiple regions** and **availability zones** to support the desired **High Availability** requirements.

