

From Effective Management of Wi-Fi Networks to Enabling the Secure Smart Home 2018-2023

By Adlane Fellah, CWNA, CWTS, MBA
+ 1 305 865 1006
afellah@maravedis-bwa.com

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1. Executive Summary

Drivers

With the proliferation of devices, the home is rapidly becoming a dense environment requiring a new level of Wi-Fi performance and coverage. The wireless footprint of these devices varies considerably and, unless some order is established, is a sure way towards an inconsistent Wi-Fi experience. Wi-Fi performance, and by extension the user experience, will suffer due to many environmental factors, such as congestion, noise, and interference. Typically, users are unable to differentiate between these problems caused by Wi-Fi, and other problems in the access network, or in the underlying applications. Top factors affecting Wi-Fi performance include poor CPE (Customer Premise Equipment) placement, neighbor interference, dead zones due to the layout of the home, and presence of too many legacy devices operating exclusively at 2.4GHz.

Many residential subscribers are tackling the aforementioned problems in their own way (and at their own risk) by purchasing third-party hardware in retail stores. However, at the end, if they fail to fix their Wi-Fi issues, they will blame their service providers for it, resulting in higher service calls, churn, and OpEx (operational expenses) for the carriers.

Service providers' strategies

As a result, service providers are now increasingly taking ownership of the Wi-Fi experience and are on a mission to educate their customers and manage their Wi-Fi experience for them. To this end, while some carriers sell home Wi-Fi as a service, others include it as part of their normal broadband service at no additional cost.

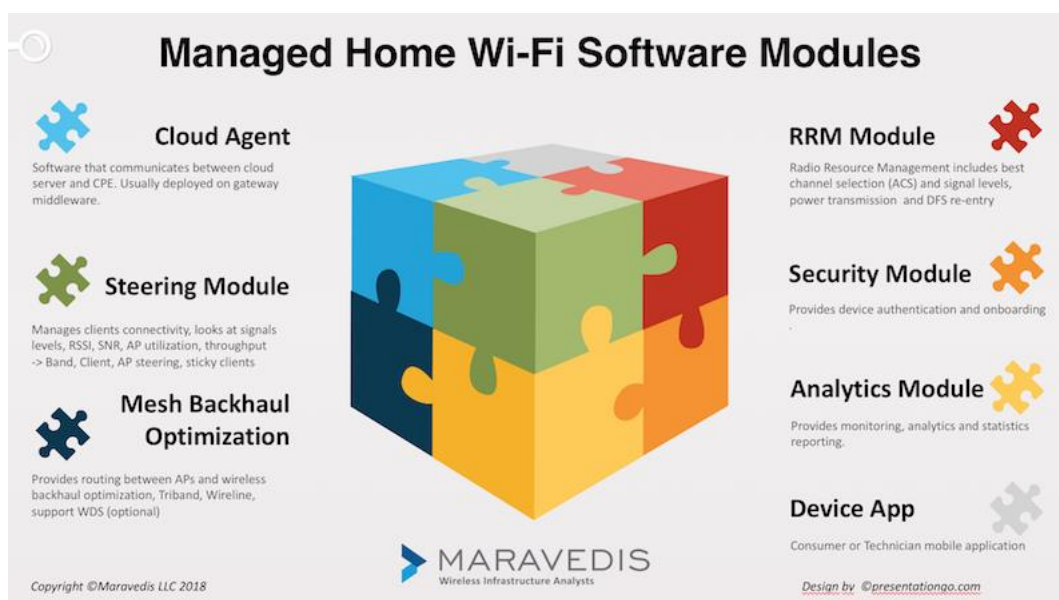
However, how do we define managed home Wi-Fi? In essence, the carrier takes over control of the home Wi-Fi experience by taking control of the equipment and gaining visibility of what is happening inside the home all the way to the client device.

Managing home Wi-Fi is more complex than it appears from the outsider perspective. In fact, it involves many aspects, and the corresponding technology solutions in supply reflect this complexity. There is no one single approach to solve all coverage and performance problems that would fit them all. Consequently, service providers can opt for various approaches to resolving fronthaul and backhaul issues. Some operators we spoke to, e.g., Comcast or Bell Canada, are in favor of a multi-AP strategy where a 4X4 radio is complemented with a number of extenders backhauled wirelessly with a dedicated channel. By contrast, European service providers have traditionally opted with a wireline backhaul and a limited number of access points.

Elements of managed Wi-Fi

There are different approaches and elements to solving the home Wi-Fi performance and coverage issues. Each vendor we spoke to has its own approach and “secret sauce” comprised of algorithms sold in modules to perform the essential functions needed to solve emerging problems.

In the graph below, we summarize these functions. Some functions are essential for resolving performance within a single access point (intra-AP), while others are core to enabling the coverage and roaming (inter-AP). Each software module is destined to perform a particular function, or set of functions. Where specifically in the network each module resides, as well as how it is implemented, varies across vendors and/or according to service provider preferences.



EasyMesh

The introduction of a standardized multi-access point smart Wi-Fi system by the Wi-Fi Alliance is a welcome development. It is obvious that the service providers who have not yet introduced managed Wi-Fi systems will gain the most from having a standardized approach to support their multivendor strategies. However, many service providers have spent years working to enhance a range of proprietary solutions, including investing in some of the companies (e.g., SoftAtHome or Plume). It is unlikely that these service providers will rush to adopt EasyMesh, unless they want to introduce a second vendor. Furthermore, those vendors that are hardware agnostic, such as ASSIA, could play a key role in enabling the deployment of EasyMesh by providing the cloud-based software layer to turn on top of the standardized chips.

Virtualization

Virtualization of the CPE (Customer Premise Equipment) is a buzz word that has not gained much reality in the home yet. Eventually, we can foresee that a number of functions, such as firewall and NAT, will move from the physical box to the cloud, thereby enabling operators to more rapidly introduce new services. At the moment, however, the benefits of the CPE are still being evaluated by the carriers, resulting in that more intelligence and power than ever before is needed to handle the ever-increasing number of connected devices.

Towards the Smart Home

In recent years, the connected “smart” home has become the battleground for device manufacturers, network suppliers, and service providers, all wanting a piece of the action. In the traditionally controlled home space, service providers are under the attack by the entry of OTT suppliers such as Google, Amazon, and Apple in and they need to react or otherwise be forced to remain dumb pipe providers.

For operators, adaptive Wi-Fi is the first step towards converting the connected home into a smart-home by delivering a modern service delivery platform that is cloud-based, highly scalable, cognitive, and allows to leverage actionable data and create new applications and services sufficiently well and fast to outpace Amazon, Google, and Apple.

Along with the service delivery platform, cognitive Wi-Fi will enable to onboard, configure, and secure IoT (Internet-of-Things) devices, such as cameras, in millions of homes with common middleware. However, a number of challenges remain in ensuring interoperability and compliance between radios and communication protocols.

Forecasts 2018-2023

Managed Wi-Fi is a fast-growing market. We forecast that, by 2023, over 140 million broadband lines in the top 34 countries worldwide will have service provider managed Wi-Fi. This represents a 14% penetration of the total broadband lines in service in 2023.

2. Methodology

All company profiles included in the present report are the result of a combination of extensive briefings and numerous email exchanges. We did not attempt to profile every player in the industry, but rather selected those who we assumed to be leaders in this domain and those who were willing to share their insights with us.

We also interviewed leading associations contributing to the development of standards and best practices for home Wi-Fi, such as the Wi-Fi Alliance, the Broadband Forum, the CableLabs, and the Broadband Wireless Alliance.

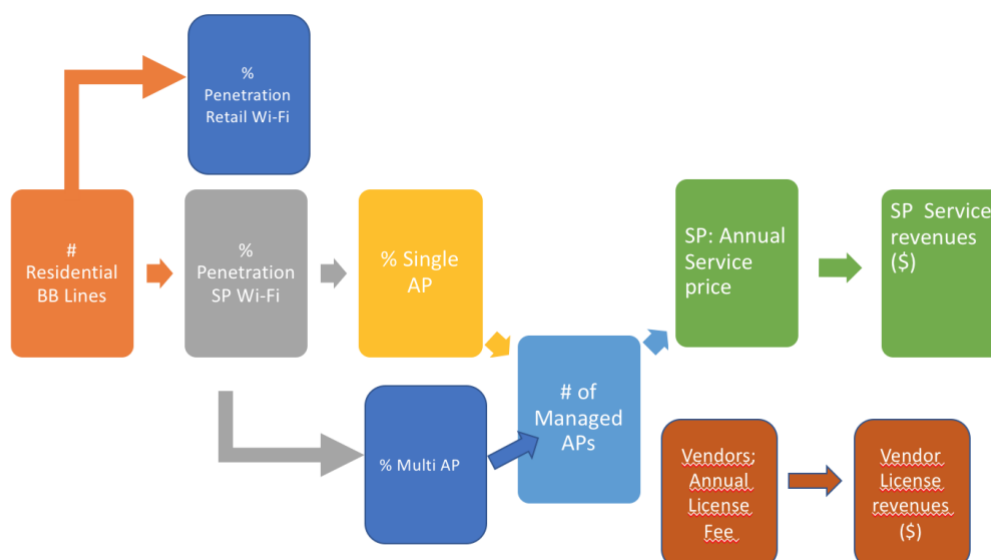
Furthermore, numerous free research studies, articles, and blogs on home Wi-Fi, and smart home trends were also scrupulously reviewed.

Forecasts

For each of the operators included in our forecasts, we built forecasts for the following two categories:

- Home broadband lines with home managed Wi-Fi with penetration rates
- Average number of devices: gateways, extenders, STBs, repeaters

The licensing models and the average licensing fees vary considerably per deployment scenario between the agents deployed on 3rd party gateways, fully integrated solutions (hardware and software), solutions with mesh, solutions with Power Line Communication or wireline backhaul, hosted solutions on AWS (OpEx), or purchased with a perpetual license (CAPEX). Consequently, we limited our forecasts to the number of licenses and units rather than dollars. Few vendors were willing to disclose how much they charge their customers for those licenses, which rendered any revenue forecast more than educated guess. Most vendors are still private companies with no obligation to report revenues. Said differently, we asked and got few detailed responses.



From the service provider perspective, solutions are either subsidized by the operator or sold at a monthly subscription.

From previous work, we have a detailed count of the number of broadband lines per operator per country and the understanding of their broadband strategies vis-à-vis homespots and managed Wi-Fi. From this, we built our forecasts with a number of assumptions clearly detailed in our companion spreadsheet available in the corporate license of the present report.

3. Scope of the Report

The main topic of the present report is home-managed Wi-Fi—i.e. the elements that enable service providers to gain control and visibility of the home network beyond the broadband pipe to the Wi-Fi portion. From the customer perspective, their broadband service does not stop at the WAN port, but at their devices.

Throughout our investigation of the home Wi-Fi trends, it became clear that managed Wi-Fi represents the foundation for the connected home—i.e. the smart home with all the complexities involved in connecting Internet-of-Things (IoT) devices operating in multiple bands using wireless technologies (Zigbee, Bluetooth, etc.). Therefore, without a solid Wi-Fi foundation, there is no connected home, and service providers are aware of the need to defend and leverage their turf from the inroads of Apple, Google, and Amazon; otherwise, they risk remaining merely dumb pipe providers. As a result, managed Wi-Fi becomes the premise for a future connected home service delivery platform to enable the onboarding, securing, and managing the IoT devices that deliver the genuine connected home experience.



In a future report, we will quantify the market size for that IoT service delivery platform (SDP); however, the scope of the present report is limited to a qualitative analysis of that SDP.

Therefore, the present report provides a thorough review of home-managed Wi-Fi as viewed from the technology and business perspectives, as well as provides select market forecasts. To this end, we included a large number of profiles from solution vendors who agreed to spend a considerable amount of time answering our questions and sharing their views on the technology, as well as pertinent regulatory and market trends. Here, we would like to express our gratitude to all of them.

The present report also presents case studies of select leading service providers who were willing to provide us a briefing and discuss their strategies and roadmap for managed-home Wi-Fi. We are grateful to them as well.