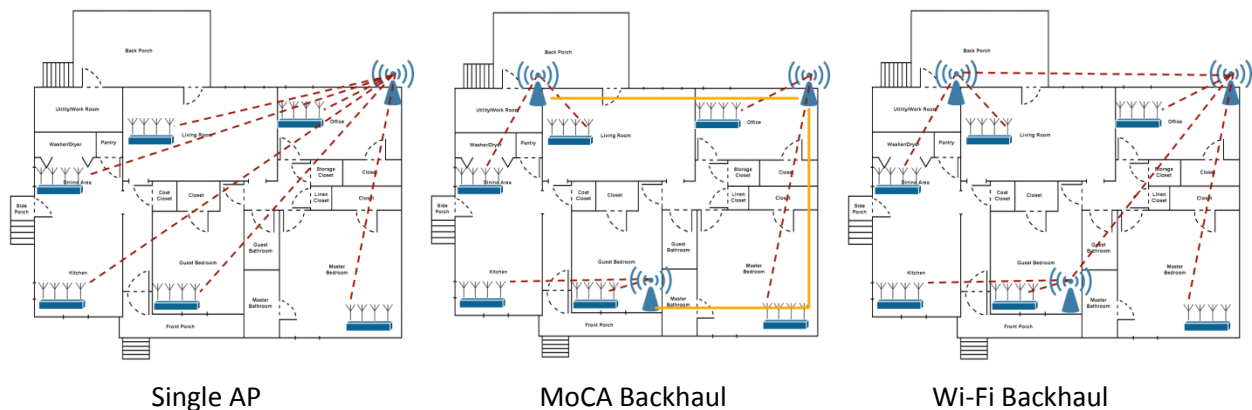




# Wi-Fi MoCA Field Test Plan

## 1 Purpose of the Task Force

The task force intends to develop a test plan and conduct field tests for a comparison of MoCA (wired backhaul) and Wi-Fi mesh (wireless backhaul) in homes. Specifically, the Alliance would like to validate and/or counter marketing claims of sustained performance and whole-home coverage by Wi-Fi mesh vendors. The catalyst for this TF is requests from operators on the MoCA Board of Directors for real-world testing of Wi-Fi mesh products in comparison to wireless extenders using MoCA technology.



## 2 Scope

It was agreed that 10 houses will be sufficient as a representative sample. Though more may be a better representative sample, 10 homes will shorten the total time to complete testing, as well as control costs.

Thus the charter of this group will be to orchestrate field tests comparing the two home networking technologies and report the results to members and the home networking/operator value chain.

Measurement criteria discussed for comparing the two technologies:

- Whole home coverage capability
- Sustained performance in every room including deviations in data rates per room.
- Deviations in latency(s) in transmission in content

It was determined by the group that ease of installation will not be an objective due to the thorough and complex nature of testing, and corresponding need for professional/knowledgeable technicians.

## 3 Test Locations

It is recognized that houses from around the country should be sampled to account for differences in construction materials. Size of the house should be “typical” and should not be unusually small or large.

Note: Test homes need radio silence as much as possible.

## 4 Test Bed Equipment

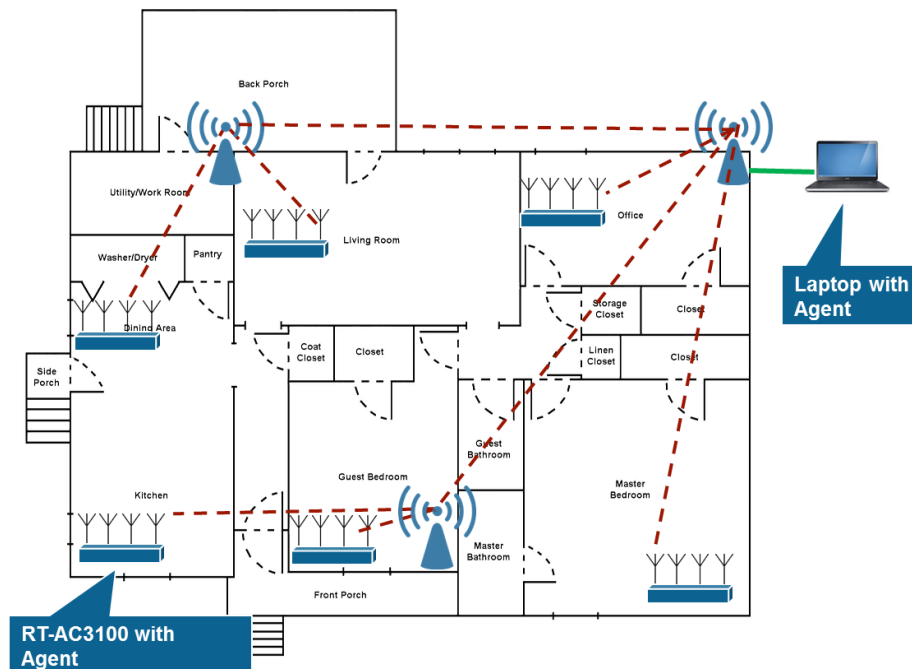
### 4.1 Wi-Fi Mesh Equipment

Wi-Fi mesh products identified for testing include those from:

- Eero
- Plume
- Netgear Orbi

Products identified that will not be included

- Google Mesh – unavailable when the field trial started
- Amplify – similar to Eero

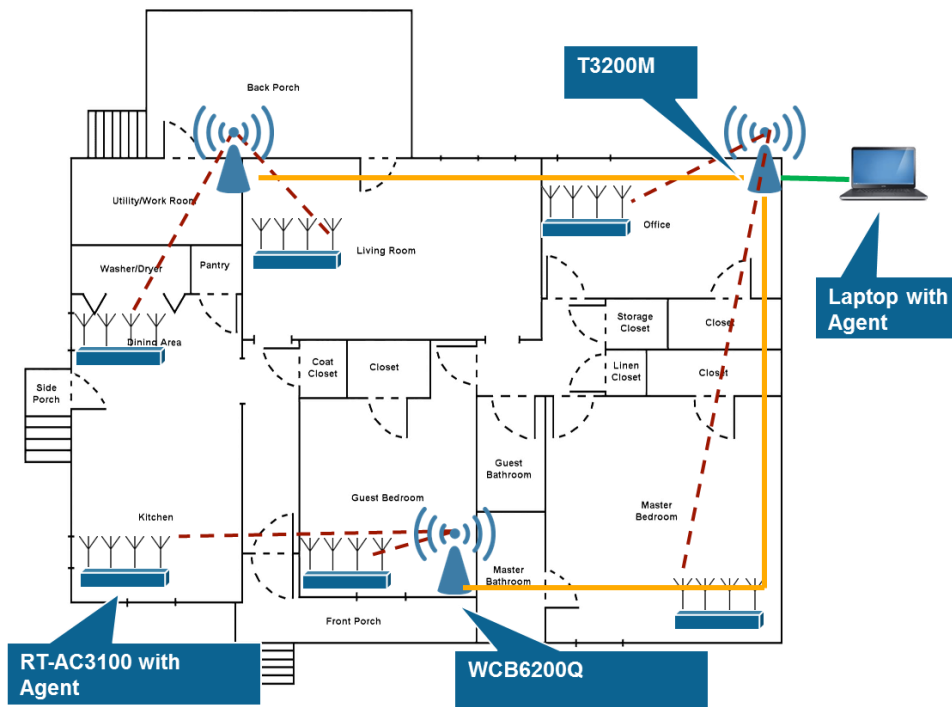


The Task Force will purchase products independently at retail to alleviate any concern with vendor collaboration that they may “game” the devices and may directly or indirectly influence results. MoCA Alliance may also suffer some kickback questioning of the results and/or methodology if results are less than stellar or even satisfactory. Securing products independently provides some credibility as we can be sure that products used are those available to end users.

## 4.2 MoCA Test Equipment

The MoCA technology to be tested is MoCA 2.0 Bonded. The equipment to be used is Wi-Fi extenders that integrate Wi-Fi 802.11ac and MoCA 2.0 Bonded, though operators are expected to provide feedback as to other equipment desired for testing.

- Main AP: Actiontec T3200M
- Satellite AP: Actiontec WCB6200Q



## 4.3 Test Endpoints

Equipment under consideration:

- Asus Retail RT-AC3100 router in “media bridge” mode with AT4 Agent running locally to collect Wi-Fi parameters

Note: Not planning to use tablets, PCs, etc due to reliability/repeatability issues and they often have other processes running that add additional traffic.

## 4.4 Flow Generation/Measurement Equipment

Tools under consideration:

- AT4 Wireless (this is what the Wi-Fi Alliance is using)

<https://www.at4wireless.com/it-services-solutions/at4wireless-performance-test-tool.html>

Works on multiple devices, PCs, ARM devices, mobile phone, etc.

## 5 Strawman Test Procedure:

### 5.1 Pre – Setup (before visiting home)

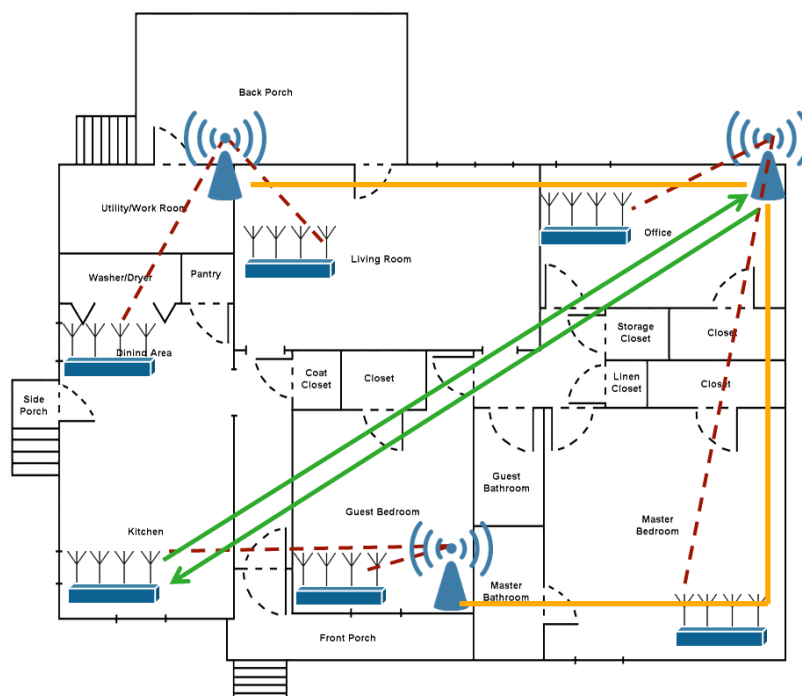
1. Properly document home
  1. Floor Plan
  2. Size / Material
  3. MPOE (where the current router is)
  4. Location of current Wi-Fi Router/Gateway
  5. Coax locations
2. Identify positioning of 9 test points across home
3. Identify positioning of Mesh solutions
4. Identify positioning of MoCA fed APs and Satellites

Need to use floor plan for placement of 9 endpoints ahead of time – typically one per room. In addition, where do people commonly use devices? A heat map and a floor plan of homes in advance will help to determine a reasonable location of devices.

### 5.2 On Site

1. Check and characterize neighborhood radio interference. (Conduct an AP sweep at the beginning and end of the tests with the test APs/STAs all turned off.)
2. Technician to install Main AP, mesh and MoCA extenders (per the pre-site plan).  
The mesh nodes be placed in exactly same place for all products.

### 5.3 Conduct the tests



These 5 scenarios are to be tested:

1. Main AP only
2. Main AP with MoCA Satellites (Extenders)
3. Mesh system #1
4. Mesh system #2
5. Mesh system #3

For each scenario, Record the entire list of parameters below while using these types of traffic

- Individual Endpoint Performance (all endpoints connected, but only one source/sink for traffic)
  - TCP-IP Goodput to each endpoint (Will test both upstream and downstream)
  - UDP Goodput to each with max < 0.1% Packet loss
- Simultaneous to all Endpoint Performance
  - TCP-IP Goodput to all endpoints (simultaneously)
  - UDP Goodput to all endpoint (each 200 Mb/s) with Max < 0.1% packet loss

#### **Parametric / Statistical Information to be collected on 802.11ac (5 GHz)**

Note: AT4 agent must be running on the device with Wi-Fi to get Wi-Fi stats)

1. Router / APs (device specifics)
  - a. Channel
  - b. Tx Power
  - c. Tx/Rx Phy Rate (for each endpoint served)
  - d. Noise Floor
  - e. Channel Occupancy (AT4 response: Estimated from: 1. CTS; 2. Raspberry Pi AP blocked beacon measurement.)
2. Endpoints
  - a. Channel
  - b. Tx/Rx PHY Rate
  - c. RSSI
  - d. Noise Floor
  - e. MCS
  - f. Channel Occupancy (AT4 response: Estimated from: 1. CTS; 2. Raspberry Pi AP blocked beacon measurement.)
  - g. Throughput
  - h. Latency

## **5.4 Test Time Estimate**

Each home expected to take upto 2 days.