Electronics

External Audience Protocol (EAP) - Wireless Routers - Wireless Routers - Wireless Routers

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External Audience Protocol (EAP) - Wireless Routers - Mesh Routers

Wireless Routers Test Protocol

Introduction

The following document presents the protocol for testing and evaluating Wireless Routers and Mesh Routers at Consumer Reports. The purpose of this test process is to expose the performance strengths and weaknesses for both Wireless Routers and Mesh Routers, and to make a final assessment of its overall performance.

A high-level description of our test process can be summarized by the following list of attributes:

1. Versatility
2. Ease of Setup
3. Throughput-near
4. Throughput-mid-range
5. Throughput-far
6. Data Privacy
7. Data Security

Description of Test Process

These tests are conducted in-house in a designated hallway at our facilities. The testing protocol for Wireless Routers has included the procedure of connecting the router to a laptop (Server) running a network performance measurement tool (JPerf) for collecting a set of measurements at various distances and frequencies. A second laptop (client) running the same tool in client mode is used to measure the throughput of the router at predetermined distances and frequencies.

Each attribute’s test process is a tabulation of sub scores that include, but are not limited to, the below examples.

1. Versatility
   - Orientation choices (can router be wall mounted)
   - Number of LAN ports
   - Prioritization (QoS)
   - Parental controls feature
   - Number and type of USB ports
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2. Ease of Use (Ergonomics)
   - Smartphone app-based setup feature
   - Web browser-based setup feature with a wizard
   - Status LEDs
   - Wi-Fi protected setup
   - Guests network presence and setup

3. Throughput-near
   - The throughput (speed) of the communications is measured very near the router in a "typical" house. For our test, this was 8 feet away from the router in a hallway. The test result is the actual data sent and received by client and server, and not the associated overhead messaging sent along with it.
   - For Mesh Routers, the client is placed 8’ from the base. The test result is the actual data sent and received by client and server, and not the associated overhead messaging sent along with it.
   - The wireless router and mesh router testing consist of measuring throughput for the different standards (802.11n, 802.11ac, and 802.11ax) and on both 2.4GHz and 5GHz frequency bands.

4. Throughput-mid-range
   - The throughput (speed) of the communications is measured further away from the router but still in our "typical" house. For our test, this was 20 feet away from the router in a hallway. The test result is the actual data sent and received by client and server, and not the associated overhead messaging sent along with it.
   - For Mesh Routers, the satellite is placed 20’ from the base, and the client placed 20’ from the base, attached to the satellite. The test result is the actual data sent and received by client and server, and not the associated overhead messaging sent along with it.
   - The wireless router and mesh router testing consist of measuring throughput for the different standards (802.11n, 802.11ac, and 802.11ax) and on both 2.4GHz and 5GHz frequency bands.

5. Throughput-far
   - The throughput (speed) of the communications is measured far away from the router using a "typical" house. For this test, the distance was 55 feet away from the router in a hallway where the device is located around the corner from the router to negotiate the 55 feet. The test result is the actual data sent and received by client and server, and not the associated overhead messaging sent along with it.
For Mesh Routers, the satellite is placed 20’ from the base, and the client placed around the corner to negotiate the 55’ from the base, but attached to the satellite located 35’ away. The test result is the actual data sent and received by client and server, and not the associated overhead messaging sent along with it.

The wireless router and mesh router testing consist of measuring throughput for the different standards (802.11n, 802.11ac, and 802.11ax) and on both 2.4GHz and 5GHz frequency bands.

6. **Data Privacy**
   - A measure of how the device and its service provider collect, share, and use your data, and the user's ability to control the flow of their data. Analysis is based on (but, not limited to) evaluation of user interfaces and publicly-available material.

7. **Data Security**
   - A measure of how well the device and its service provider protect your data with respect to
     - Authentication
     - Encryption
     - Software updates
     - Analysis of network traffic
     - Penetration testing