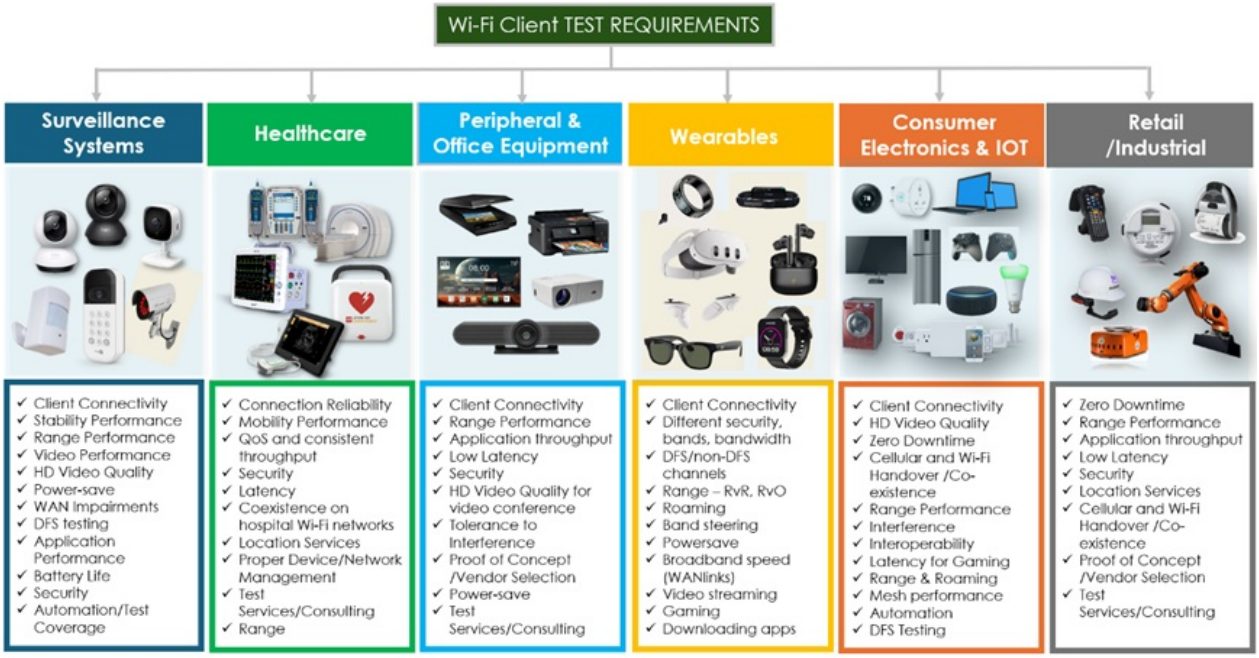
sales@candelatech.com
support@candelatech.com
+1 (360) 380-1618 [PST, GMT -8]

Comprehensive Station Testing with LANforge

Wi-Fi Station Testing focuses on evaluating the performance, stability, and behavior of Wi-Fi client devices under various conditions. This testing is crucial for understanding how well devices interact with the Wi-Fi infrastructure and how they perform across different environments.

Need for Station Testing

Modern Wi-Fi networks rely not just on well-designed access points, but also on how Wi-Fi clients such as smartphones, laptops, IoT devices, and smart home appliances respond under different conditions. Without thorough Wi-Fi client testing, even an optimally configured network can fall short in delivering consistent and reliable user experience.



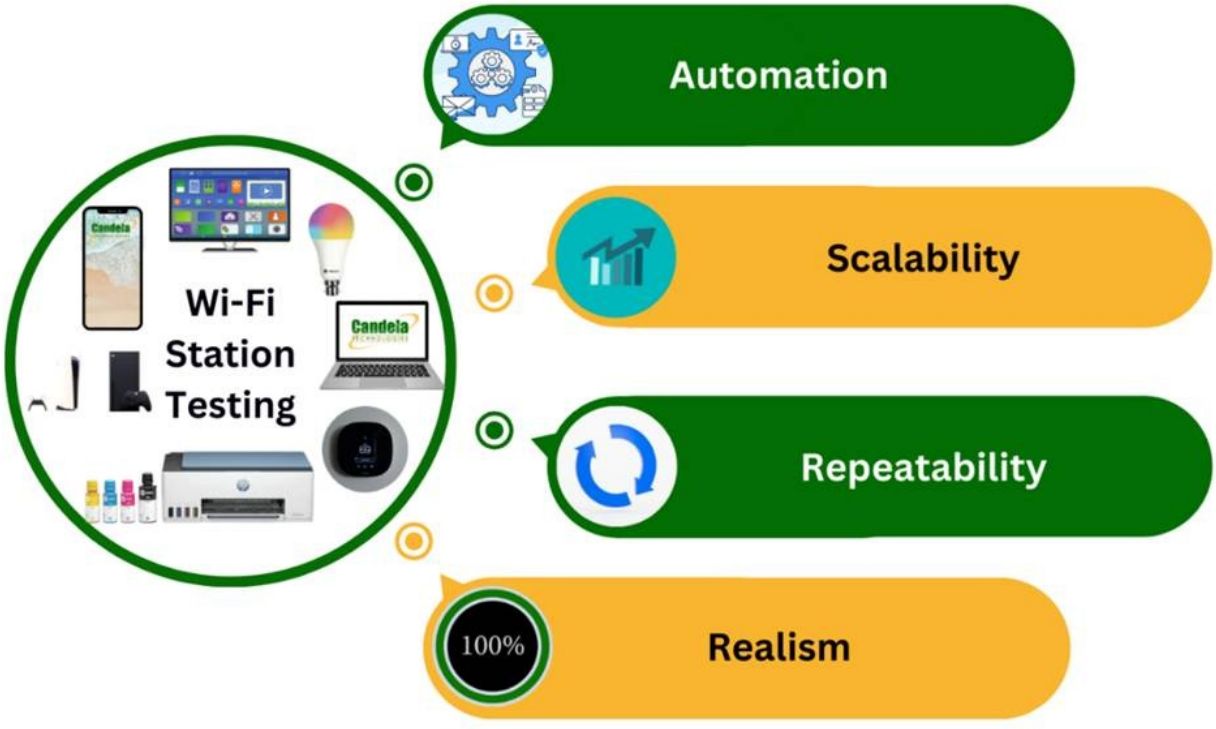
However, due to the dynamic nature of wireless environments, Wi-Fi station testing can be complex and unpredictable. This is where Candela Technologies offers a streamlined solution using LANforge, enabling accurate, repeatable, and scalable station testing.

Candela's Station Testing Solution

Candela's Station Testing Solution leverages the LANforge platform to evaluate a wide range of Wi-Fi-enabled devices including:

- Wireless peripherals (printers, scanners, cameras)
- Healthcare devices (patient monitors, wireless sensors)
- Consumer electronics (smart TVs, laptops, smartphones)
- Smart home devices (thermostats, security cameras, IoT sensors)

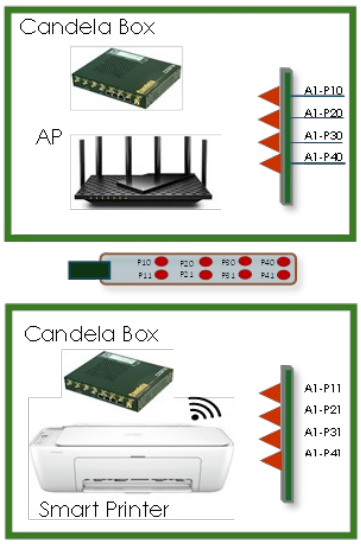
The solution provides a realistic and automated test environment, ensuring precise evaluation of Wi-Fi device performance across different network and usage conditions.



Key Benefits

- **Automation:** Reduces manual setup and testing time with automated workflows.
- **Scalability:** Supports simultaneous testing of multiple client devices and network setups.
- **Repeatability:** Delivers consistent results across repeated test cycles.
- **Realism:** Simulates practical real-world conditions for accurate performance insights.

Candela's Test setup for Wi-Fi Station Testing



Building Blocks of the System

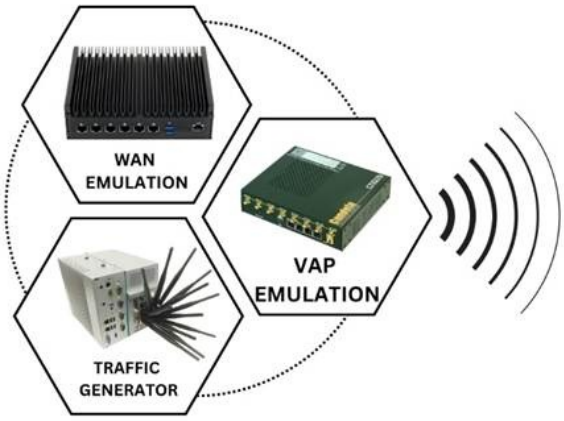
The testbed is composed of modular components that form the foundation of a comprehensive Wi-Fi station test system:

- **Station Emulation:** Creates controlled interference and stress test conditions
- **Access Point Emulation:** Simulates AP behavior for connectivity and throughput validation
- **Monitor Radios:** Capture live Wi-Fi traffic and interference
- **RF Enclosures:** Isolate devices to control RF conditions
- **Programmable Attenuators:** Emulate varying signal strengths
- **RF Cables & Splitters:** Facilitate controlled RF routing and isolation

Test

1. WAN Impairments

Simulates real-world WAN conditions including latency, jitter, bandwidth limits, and packet loss. Using LANforge's WAN emulation, engineers can test device performance in constrained networks—essential for VoIP, video, and cloud-dependent applications.



WAN NETWORK EMULATION

STATIONS UNDER TEST

With LANforge, you can create real-world network emulations, enabling precise and reliable results that ensure optimal device performance across diverse network conditions.

2. Rate vs Range Test (RvR)

This test evaluates how Wi-Fi performance changes with distance. By increasing attenuation to simulate longer distances, testers measure throughput and RSSI at each step. It helps build RSSI vs throughput profiles for upstream and downstream traffic under different loads and station types.

3. Interference Test

Assesses the impact of Wi-Fi interference and channel congestion on station performance. This includes co-channel and adjacent-channel interference from other APs or clients, helping to validate stability and robustness in dense or noisy RF environments.

Stages of Testing

Effective Wi-Fi station testing is conducted in three progressive stages, each offering increasing levels of realism and scale.

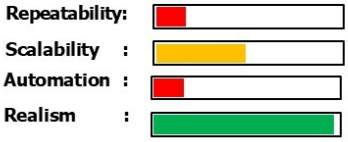
- **Stage 1:** Lab testing in RF chamber
- **Stage 2:** Lab testing in RF screen rooms
- **Stage 3:** Real world testing in test houses

The 3-approaches for Real Device Interop Testing

Lab Testing in RF Chambers

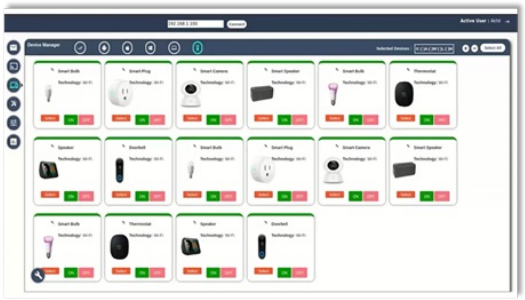
Lab Testing in RF Screen Rooms

Real World Testing in Test Houses



Stage-1: Lab Testing in RF Chambers

- Conducted in isolated RF test chambers
- High control and low external variability
- Supports fully automated, reliable test scenarios
- Ideal for early-phase performance validation



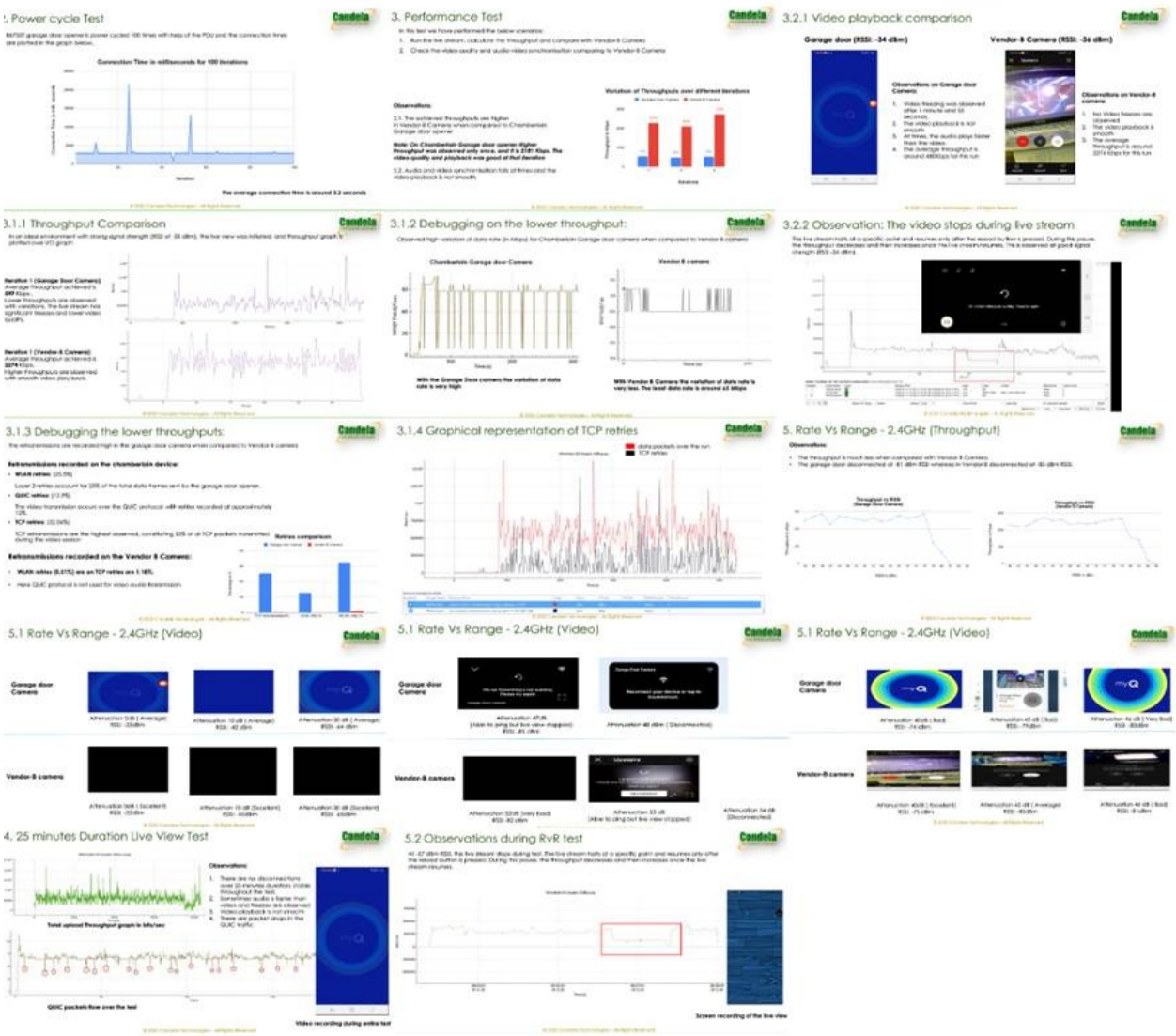
Stage-2: Lab Testing in RF Screen Rooms

- Performed in walk-in screen rooms
- Scalable and realistic setup with added display support
- Maintains automation while introducing moderate environmental variability
- Suitable for advanced test scenarios across multiple stations

Stage-3: Real World Testing in Test Houses

- Conducted in actual test home environments
- Captures practical performance data under uncontrolled real-world conditions
- Ensures devices behave as expected under user-like usage patterns and environmental variables
- Essential for final-stage validation and user experience optimization

Example Results from Testing



Candela Technologies offers a full suite of test equipment, hardware, software, and testing services for all three stages of client testing.

Lead Times: 1-2 weeks for small systems, Six to eight weeks for larger systems.

TaaS/Onsite Support: Customers with only occasional test needs can use our Test as a Service option. Candela engineers can do the testing for you in our fully equipped test lab and provide a detailed test report with recommendations. We can provide onsite setup and automation services for customers interested in purchasing the system.

For more information, please contact sales@candelatech.com or give us a call at: 1-360-380-1618

Candela Technologies, Inc., 2417 Main Street, Suite 201, Ferndale, WA 98248, USA
www.candelatech.com | sales@candelatech.com | +1.360.380.1618