Wi-Fi Setup Best Practices

Installer's Checklist For Wireless Access Points

Following these steps on every install will save you time and money, while ensuring you provide your customer the best Wi-Fi experience possible.

Step 1 - Network Requirements

Interview the customer and specify the requirements for the Wi-Fi network:

- **What is the coverage area?** Get the square footage and number of floors that need coverage.
- **How many client devices?** Find out how many devices will be connected at any given time.
- **What kinds of devices?** Review the types of devices and supported Wi-Fi standards. Older devices can limit performance for newer and faster equipment unless you plan for it.
- **How much traffic?** Determine bandwidth requirements for wireless devices based on their intended use. The LAN and the WAN must be able to support the traffic. Assume maximum usage for calculation.
- **Mobility requirements –** Find out what devices will be used where. Will clients move around between APs or stay in one area? Do client devices support fast-roaming and hand-off?
- **Network Access –** Plan for guest networks, VLAN access, and traffic control such as SSID scheduling and traffic shaping.
- **Educate the customer –** Discuss any possible risks and issues that might be encountered, along with possible solutions. Also, see "Rated vs Realistic Network Speeds" at the end of this document. This diagram makes it much easier to understand the reality of network speeds and what affects it.

Step 2 - Site Survey

Survey the location and make notes on a copy of the floor plan. Things to consider:

- **Use the right tools –** We recommend using spectrum analyzer and Wi-Fi heat mapping tools such as MetaGeek Chanalyzer, inSSIDer, or Airmagnet to survey the site. They provide valuable info about interference and other obstacles before installation, and are used to test for good coverage during network setup. See the Araknis Networks Successful Wi-Fi Installation Guide to learn more.
- **Use Araknis APs for Site Survey –** All Araknis APs feature several scan tools that can be used to do a basic scan for nearby networks, channel congestion, and interference. See the Araknis Networks AP Software Manual for more information.
- **Avoid obstacles –** Brick, concrete, tinted windows, load-bearing walls, and metal will drastically reduce signal. Note any areas that may be difficult to cover. 5 GHz has less range more trouble passing through barriers than 2.4 GHz, but 2.4 is slower, even without obstacles. See "How Building Materials Affect Wi-Fi Signal" and "2.4 vs 5 GHz Performance vs Reliability" at the end of this guide for more information.
- **Appliances and equipment –** Look for interference sources such as appliances and other noisy equipment. Many devices emit signals in the 2.4 GHz frequency range, hindering Wi-Fi performance.
- **Floors –** Survey each floor. Don't assume an AP will cover two floors.

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Step 3 - Determine Access Point Locations

- **Test results –** Plan the install locations based on your Site Survey and Heat Map results.
- **When in doubt, more is better –** Don't hesitate to use more access points in areas of concern. Don't shoot for maximum transmit power, go for even coverage.
- **Number of client devices –** Use one AP per 30 client devices on average. Highly congested areas can be tuned for performance during setup.
- **Environment –** Open floor plans typically need fewer access points per square foot than divided areas with many rooms and walls. General rule of thumb:
  - **Divided floor plan –** At least one access point per 1000-1500 ft^2 (e.g. residential/walled offices)
  - **Open floor plan –** At least one access point per 2500-3000 ft^2 (e.g. commercial/retail space)
- **Number of floors –** Depending on the building materials in use, APs may or may not provide sufficient coverage between floors.
- **Mounting location –** Avoid locations with line-of-sight obstacles between the AP and the coverage area.
- **Outdoor coverage –** The AN-700-AP-O-AC outdoor AP antenna is patterned differently than indoor models. Be sure to follow the guidelines specific to that model during planning. See the AN-700-AP-O-C Quick Start Guide and Propagation and Channel Selection Guide for more details.

Step 4 - Setup and Testing

- **Hardware installation –** Position indoor access points on the ceiling facing down toward clients in the most central part of the coverage area possible.
- **Coverage overlap –** For proper Fast Roaming and coverage strength, there should be no gap in signal between APs. Signal strength of nearby APs should be -75 to -80 dB.
- **Channel selection –** Use different channels for nearby APs. See the illustration.
- **Configure settings –** Name SSIDs, select security and Wi-Fi passwords, enable Fast Roaming and Band Steering, and change other desired settings. See the Software Manual for complete setup instructions. You can also bulk-configure settings for claimed APs in your OvrC account to save time. Go to OvrC.com for more information.
- **Survey #2 –** Run another survey after initial setup to determine the best settings for power, channels, and frequencies as needed. Make the Wi-Fi network as seamless as possible.
- **Test client devices –** Test, test, and test some more. Test with both your benchmark devices and customer devices. Run speed tests from each client device while moving around the location to ensure that all devices are working as expected. Older devices may not be compatible with features such as fast roaming.
- **Limits –** Identify the limits of the network so you can tell users where to expect coverage to end.

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Step 5 - Review with Customer

Now that you have completed the install, inform the end users about the network. Provide connection and security information, discuss if any issues or discrepancies came up that could affect their experience, and schedule a time to touch base again after a week or two.

- **Walk-through –** Do a side-by-side test with the customer using their devices (especially potential problem devices). Be sure to
- **Potential issues –** Point out potential problem areas, explain why, and suggest solutions.
- **Follow up for success –** Plan a follow-up call or visit for a week later to review any issues that arise especially with scheduled features.

How Building Materials Affect Wi-Fi Signal

Most common building materials reduce Wi-Fi signal strength:

- 3dB loss = 1/2 of original strength
- 6dB loss = 1/4 of original strength
- 10dB loss = 1/9 of original strength.

Material	Signal Attenuation
Glass window	2db
Wooden door	3db
Cubicle	3-5db
Plasterboard wall	3db
Dry wall	4db
Cinderblock	5db
Marble	5db
Glass wall with metal frame	6db
Brick wall	8db
Concrete wall	10-15db

2.4 vs 5 GHz Performance vs Reliability

	2.4 GHz	5 GHz
Operating Distance	Travels farther	Less range
Speed	Slower	Much faster
Interference	Very high	Low
Barriers	Less signal loss	More signal loss

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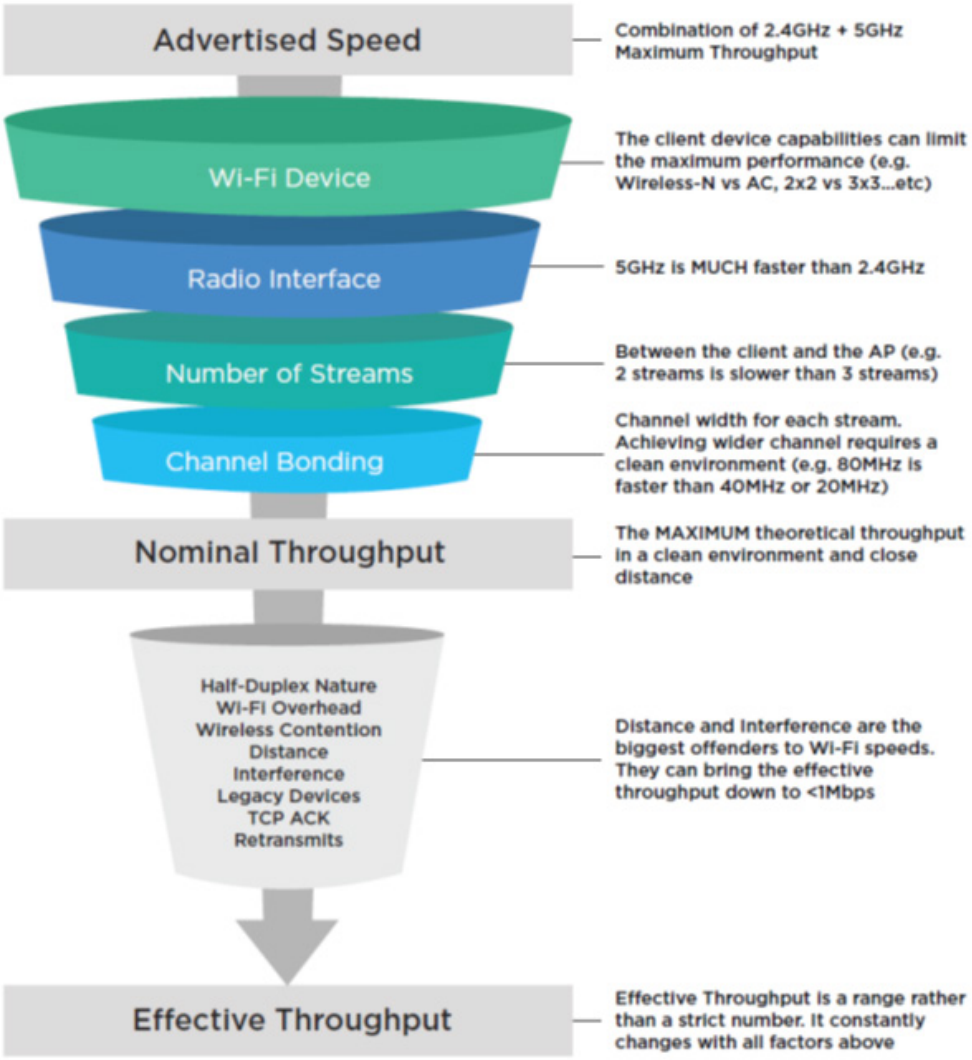
Rated vs Realistic Network Speeds



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