# UniFi® SHD

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# UniFi®

## Scalable Enterprise Wi-Fi Management

The UniFi® Ecosystem enables the system integrator to effectively and efficiently create wireless network designs of any size, from small to large, with the potential for unlimited scalability.

The built-in, dedicated security and monitoring radios of the UniFi SHD (Secure High Density) AP provides visibility into site performance, channel planning, and local interferers, allowing the integrator to properly evaluate performance and quickly respond to changing interference and security threat landscapes.

Easily accessible through any standard web browser and the UniFi app (iOS or Android™), the UniFi Controller software is a powerful software engine ideal for high-density client deployments requiring low latency and high uptime performance.

## Features

**Powerful Hardware**  The UniFi SHD AP features the latest in Wi-Fi 802.11ac Wave 2 MU-MIMO technology combined with dedicated security and Bluetooth radios.
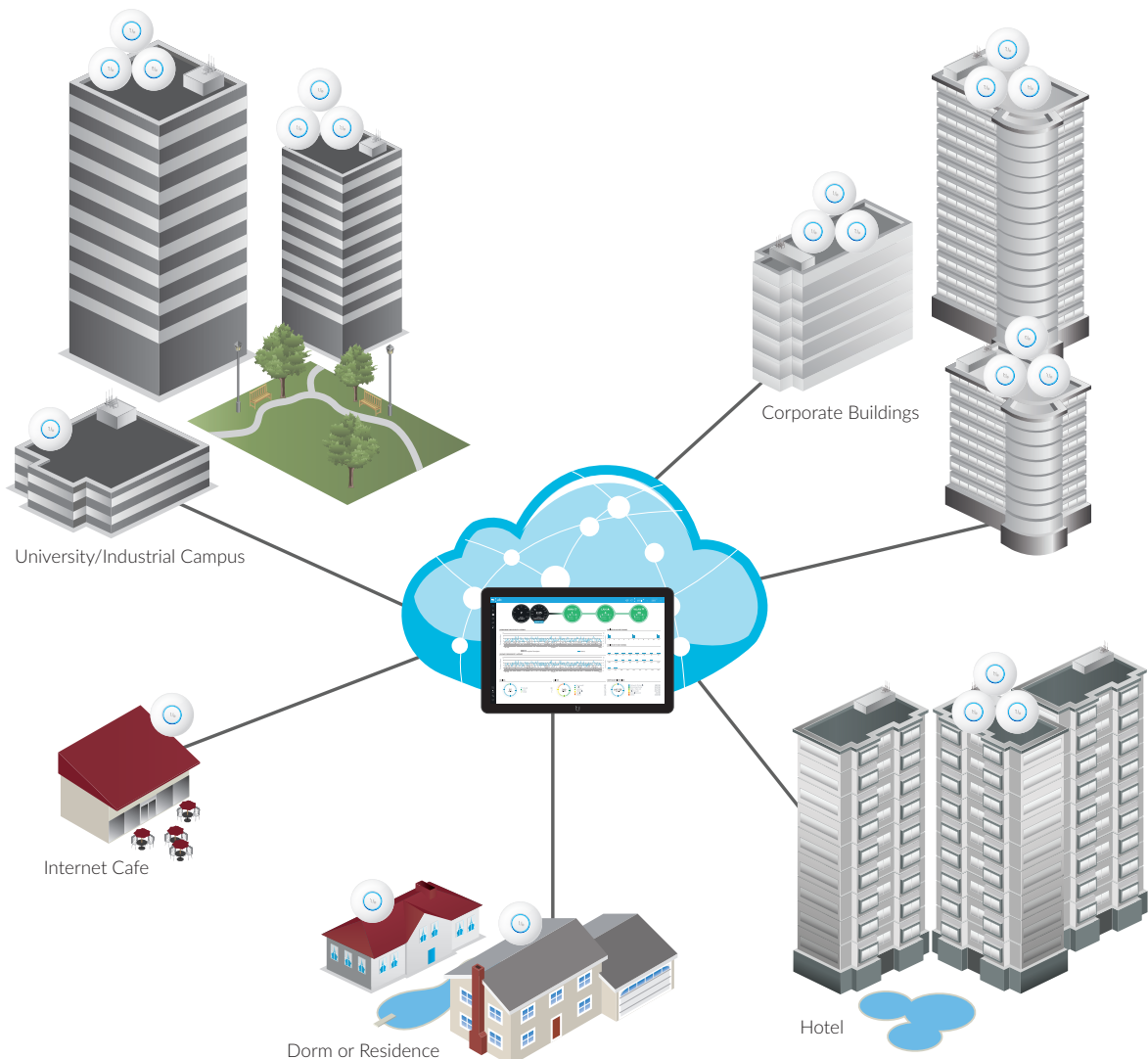
**Intuitive UniFi Controller Software**  The system integrator can leverage the controller to easily configure and administer an enterprise Wi-Fi network.

**Expandable**  The system integrator can start with one (or upgrade to a multi-pack) and expand to thousands while maintaining a single unified management system.

**Save Money and Save Time**  UniFi comes bundled with a software controller that can be deployed on an on-site PC, Mac, or Linux machine; in a private cloud; or using a public cloud service. For more information about UniFi Cloud or UniFi Elite service, visit: **unifi.ubnt.com**

# Extend Your Coverage

With the UniFi Controller software running in a NOC or in the cloud, system integrators can manage multiple sites: multiple, distributed deployments and multi-tenancy for managed service providers. Below are some deployment examples.



Corporate Buildings

University/Industrial Campus

Internet Cafe

Dorm or Residence

Hotel

# UniFi Controller

# 802.11ac Technology

Initial 802.11ac Wave 1 SU-MIMO (Single-User, Multiple Input, Multiple Output) technology allows an earlier-generation AP, such as the UniFi AC Pro AP, to communicate with only one client at a time.

802.11ac Wave 2 MU-MIMO (Multi-User, Multiple Input, Multiple Output) technology allows a Wave 2 AP, such as the UniFi SHD AP, to communicate with multiple clients at the same time – significantly increasing multi-user throughput and overall user experience.

The following describes a 5-client scenario:

**MU-MIMO** Assuming the same conditions, a Wave 2 AP provides up to 75% improvement[1] overall over a Wave 1 AP. This improvement increases wireless performance and/or serves more clients at the same performance level.

**4x4 Spatial Streams** At any single time, a Wave 2 AP can communicate with the following MU-MIMO clients:

- four 1x1 clients
- two 2x2 clients
- one 2x2 client and two 1x1 clients
- one 3x3 client and one 1x1 client

A 4x4 Wave 2 AP delivers up to 33% greater performance[1] than a Wave 1 AP that is 3x3 in both radio bands.

**Real-World Performance** The UniFi SHD AP is the first UniFi 802.11ac Wave 2 AP with a dedicated security radio. Combining the performance increases from MU-MIMO technology and the use of 4x4 spatial streams, the UniFi SHD AP delivers up to 125% greater performance[1] than a typical Wave 1 AP.

**Client Compatibility** For optimal performance, use MU-MIMO clients. SU-MIMO clients will also benefit and gain up to 10-20% greater performance when used with the UniFi SHD AP.

[1] Actual performance values may vary depending on environmental and installation conditions.

# High-Density Scenarios

For high-density environments, such as a concert venue or outdoor fair where there are numerous clients in a relatively small space, we recommend the UniFi SHD AP.
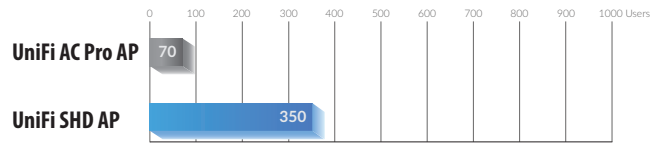
## 2.4 GHz versus 5 GHz Band

When you use the 2.4 GHz band in a high-density location, you encounter self-interference and channel saturation.
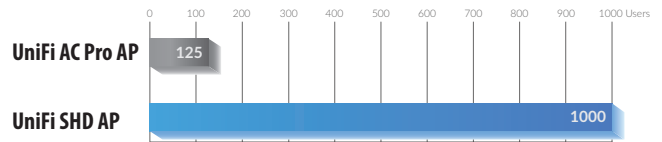
When you use the 5 GHz band, you can deploy smaller cells (coverage areas), so you can support more clients in any cell that deploys more than one AP.

With the advantages of MU-MIMO technology and 4x4 spatial streams, the UniFi SHD AP can support more than triple the number of users[2] than a typical Wave 1 AP can.
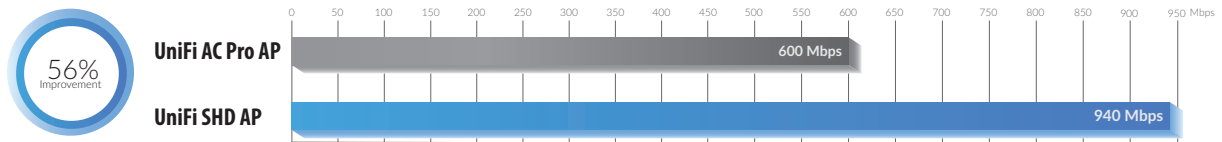
## Recommended Maximum Number of Users

| | 0 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 Users |
|---|---|---|---|---|---|---|---|---|---|---|---|
| UniFi AC Pro AP | 70 | | | | | | | | | | |
| UniFi SHD AP | | | | 350 | | | | | | | |

## Theoretical Maximum Number of Users

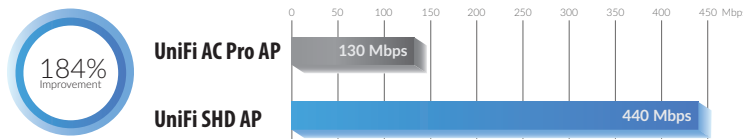| | 0 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 Users |
|---|---|---|---|---|---|---|---|---|---|---|---|
| UniFi AC Pro AP | | 125 | | | | | | | | | |
| UniFi SHD AP | | | | | | | | | | | 1000 |

For more information, go to:
**ubnt.link/UniFi-UAPs-High-Density**

[2] Actual numbers may vary depending on environmental and installation conditions.

## Single-Client Aggregate Throughput

**56% Improvement**

| | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 Mbps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UniFi AC Pro AP | | | | | | | | | | | | | 600 Mbps | | | | | | | |
| UniFi SHD AP | | | | | | | | | | | | | | | | | | | 940 Mbps | |

## 10-Client Aggregate Throughput

**184% Improvement**

| | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 Mbps |
|---|---|---|---|---|---|---|---|---|---|---|
| UniFi AC Pro AP | | 130 Mbps | | | | | | | | |
| UniFi SHD AP | | | | | | | | 440 Mbps | | |

## 100-Client Aggregate Throughput

**900% Improvement**

| | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 Mbps |
|---|---|---|---|---|---|---|---|---|---|---|
| UniFi AC Pro AP | 30* | | | | | | | | | |
| UniFi SHD AP | | | | | | 300 Mbps | | | | |

* Mbps
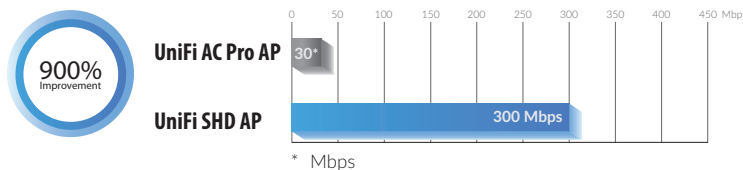
## 802.11ac Wave 1 SU-MIMO

*SU-MIMO: A Wave 1 AP communicates with one client at a time.*

## 802.11ac Wave 2 MU-MIMO

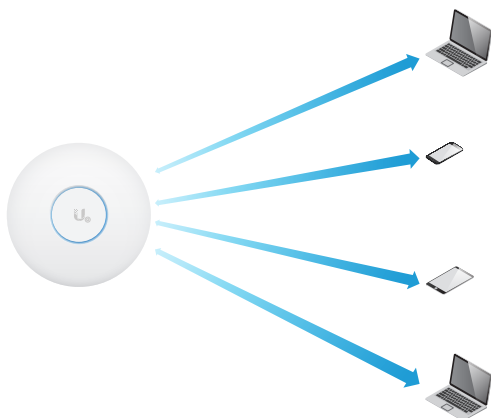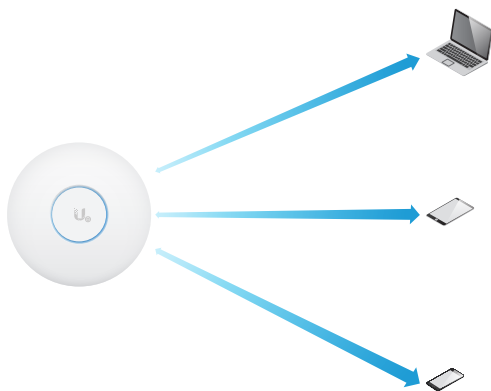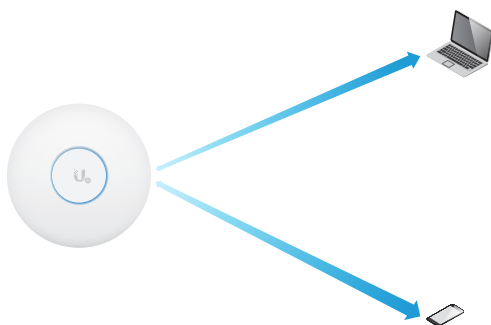*MU-MIMO with 1x1 clients: The UniFi SHD AP communicates with four 1x1 clients at a time.*

*MU-MIMO with 2x2 and 1x1 clients: The UniFi SHD AP communicates with one 2x2 client and two 1x1 clients at a time.*

*MU-MIMO with 3x3 and 1x1 clients: The UniFi SHD AP communicates with one 3x3 client and one 1x1 client at a time.*

# Security Overview

The UniFi SHD AP delivers unprecedented wireless awareness and security, including tools for real-time spectrum monitoring, airtime utilization analytics, and intrusion detection/prevention.

**Dedicated Spectral Security Radio**  Using a persistent spectral scan, the UniFi SHD AP constantly monitors the RF environment to check for both potential malicious activity and the best channel for network performance.
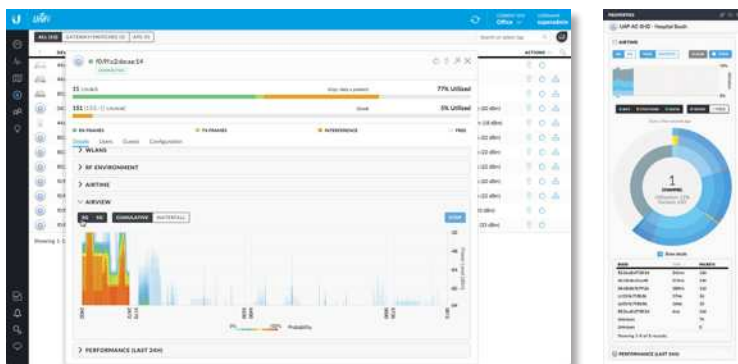
The dedicated security radio allows the UniFi SHD AP to scan for security threats, such as malicious frames and rogue access points, while maintaining throughput for client devices. At the same time, UniFi, in conjunction with the UniFi SHD AP, analyzes and displays the wireless spectrum and airtime utilization to allow the network admin to have unprecedented real-time visibility into the spectral and protocol usage in the network.

**Threat Management**  The UniFi SHD AP's dedicated security radio provides persistent threat management to act as a Wireless Intrusion Prevention System (WIPS)* and Wireless Intrusion Detection System (WIDS). Such a dedicated radio affords frequency agility – meaning all available Wi-Fi channels are monitored constantly for threats – not just the channels the AP is using.

**Spectrum and Wi-Fi Packet Analysis**  The airView® tool offers real-time visibility into your RF spectrum. Because it uses the dedicated security radio, it analyzes all of your available RF channels without affecting performance or disrupting client activity. The airTime tool visualizes and analyzes how the APs use channels in real time. The breakdown is by frame type, clients, neighboring APs, protocols, and interference.

Spectrum view and Wi-Fi packet analysis can be done simultaneously, without affecting stations, for a total view of the RF environment and channel utilization.

\* Currently full-time rogue access point detection is the main WIPS feature of the dedicated security radio.

UniFi SHD

# Hardware Overview

Deploy the UniFi SHD AP in high-density environments requiring maximum wireless performance. The UniFi SHD AP features simultaneous, dual-band, 4x4 MU-MIMO technology and convenient 802.3at PoE+ compatibility. Available in single- and five-packs.

**Easy Mounting**  Its sleek design seamlessly integrates into any environment (all accessories included) and is compatible with existing UAP-AC-PRO mounts.

**LED**  The unique LED provisioning ring provides administrator location tracking and alerts for each device.

**Dual Gigabit Ethernet**  The UniFi SHD AP offers a secondary port available for bridging.

**Superior Processing Power**  The UniFi SHD AP is capable of complex operations (guest control, filtering, and other resource-intensive tasks) that may slow down a lesser-equipped AP.

**Power over Ethernet (PoE) Standard**  The UniFi SHD AP is compatible with an 802.3at PoE+ compliant switch. We recommend powering your UniFi devices with a UniFi PoE Switch (sold separately).

**UniFi PoE Switch**  Available in 8*, 16, 24, and 48-port versions with multiple power output options, the UniFi PoE Switch conveniently offers auto-sensing IEEE 802.3af PoE/802.3at PoE+ and configurable 24V passive PoE.

\*  The US-8 and US-8-60W do not support 802.3at PoE+.

# Model Summary



| | UAP-AC-SHD |
|---|---|
| Environment | Indoor or Outdoor (Covered) |
| Simultaneous Dual-Band | ✓ |
| 2.4 GHz Radio Rate | 800 Mbps |
| 2.4 GHz MIMO | 4x4 |
| 5 GHz Radio Rate | 1733 Mbps |
| 5 GHz MIMO | 4x4 |
| Dedicated Security Radio | ✓ |
| Secondary Ethernet Port | ✓ |
| PoE Mode | 802.3at PoE+ |
| Ceiling Mount | ✓ |
| Wall Mount | ✓ |
| Wireless Uplink | ✓ |
| airTime | ✓ |
| airView | ✓ |
| WIPS | ✓ |
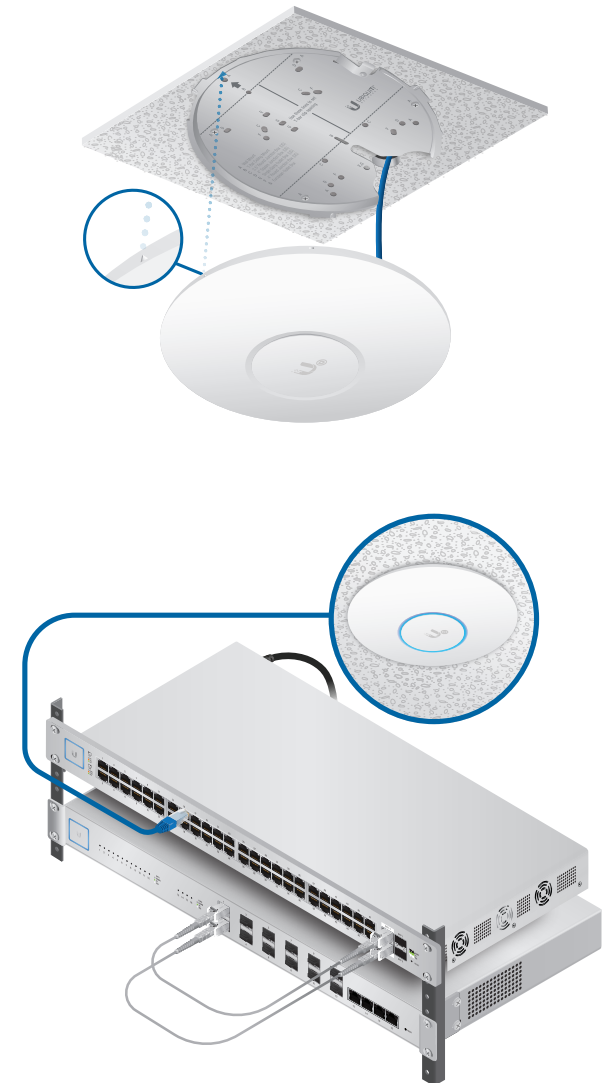
# UAP-AC-SHD Specifications

| UAP-AC-SHD | |
|---|---|
| Dimensions | 220 x 220 x 48.1 mm (8.66 x 8.66 x 1.89") |
| Weight<br>  With Mounting Kits | 700 g (1.54 lb)<br>830 g (1.83 lb) |
| Networking Interface | (2) 10/100/1000 Ethernet Ports |
| Buttons | Reset |
| Power Method | 802.3at PoE+ |
| Supported Voltage Range | 44 to 57VDC |
| Power Supply | UniFi Switch (PoE) |
| Power Save | Supported |
| Beamforming | Supported |
| Maximum Power Consumption | 20W |
| Radios | 2.4 GHz, 5 GHz, Security |
| TX Power<br>  2.4 GHz<br>  5 GHz | <br>6-25 dBm<br>6-25 dBm |
| Antennas<br>  2.4 GHz<br>  5 GHz | <br>(2) Dual-Port, Dual-Polarity Antennas, 6 dBi each<br>(2) Dual-Port, Dual-Polarity Antennas, 6 dBi each |
| Wi-Fi Standards | 802.11 a/b/g/n/r/k/v/ac/ac-wave2 |
| Wireless Security | WEP, WPA-PSK, WPA-Enterprise (WPA/WPA2, TKIP/AES)<br>802.11w (PMF) |
| BSSID | Up to 8 per Radio |
| Mounting | Wall/Ceiling (Kits Included) |
| Operating Temperature | -10 to 70° C (14 to 158° F) |
| Operating Humidity | 5 to 95% Noncondensing |
| Certifications | CE, FCC, IC |

| Advanced Traffic Management | |
|---|---|
| VLAN | 802.1Q |
| Advanced QoS | Per-User Rate Limiting |
| Guest Traffic Isolation | Supported |
| WMM | Voice, Video, Best Effort, and Background |
| Concurrent Clients | 1000+ |

| Supported Data Rates (Mbps) | |
|---|---|
| Standard | Data Rates |
| 802.11a | 6, 9, 12, 18, 24, 36, 48, 54 Mbps |
| 802.11n | 6.5 Mbps to 450 Mbps (MCS0 - MCS23, HT 20/40) |
| 802.11ac | 6.5 Mbps to 1.7 Gbps (MCS0 - MCS9 NSS1/2/3/4, VHT 20/40/80) |
| 802.11b | 1, 2, 5.5, 11 Mbps |
| 802.11g | 6, 9, 12, 18, 24, 36, 48, 54 Mbps |

# System Example



UniFi Controller

UniFi SHD

Wireless Clients

Wired Clients

Server

UniFi Switch
(LAN Devices)

UniFi Switch

UniFi Security
Gateway Pro

UniFi SHD

Internet

Wireless Clients

www.ubnt.com