Cambium Networks™

Exceptional Guest Wi-Fi

The explosive growth in mobile devices impact hospitality more than any other market. From 2010 through 2013, the number of devices in an average hotel nearly tripled.

With new smart TVs, voice activated assistants and network connected energy management systems – the number of devices per guest room will continue to grow.

Both business and leisure travelers consume massive amounts of data – for video and music streaming, voice calling, VPN connectivity, email and general interest web search.

The hotel guest network provides a critical link for the guest to stay connected with family, friends, and co-workers. In 2016, it was reported that the average hotel guest logs into the Wi-Fi seven minutes after entering the room.
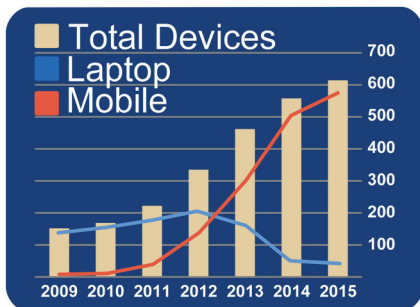
Business class hotel Survey, 2015
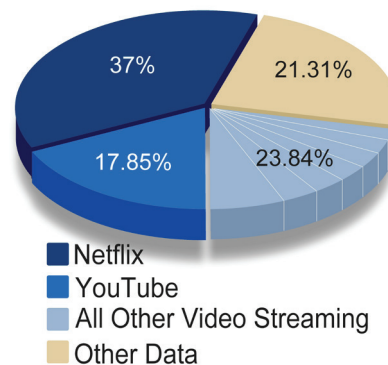
Percentage of primetime Internet traffic
Netflix and YouTube 55% — Sandvine December 2015

When it's time to upgrade, hotels will see many options from Wi-Fi manufacturers, all based on 802.11ac. And yes, they all come at a different price point.

With the goal of providing an exceptional guest experience at the minimum cost; what should a hotel choose? Three factors will help us to pick the right technology:

- What type of device does the guest have?

- How much coverage (range) and how many devices will connect?

- How complicated and expensive is it to maintain?

Notice that we didn't say, "how much speed is required?". Simple answer:

IT'S 2018, 802.11AC Wi-Fi AP IS VERY FAST

A typical smartphone sold from 2015 will easily support over 500 Mbps of Wi-Fi throughput using 802.11ac. When selecting the hotel access points, focus on features that will add value to the hotel and to the guest:

- It should be fast, of course

- Easy to install, cost effective to manage

- Include advanced features for network optimization; such as error avoidance, automatic channel selection and neighbor AP monitoring

- Include advanced features that provide value to the hotel guest; such as integrated hotspot and Enhanced Roam

- Include technology to support future hotel applications; such as location aware APIs and BLE

WHAT TYPE OF DEVICE DOES THE GUEST HAVE?

SAMSUNG S9

- 2x2 dual band Wi-Fi radio

- MU-MIMO capable

APPLE IPHONE X

- 2x2 dual band Wi-Fi radio

- MIMO

Tablet sales are slooowing down. Did you notice? Know what's not slowing down? Smart phones. In fact, the average consumer changes phones every 18 months. Many hotels are now reporting over 90% of active devices in use are smart phones.

Cambium Networks love ALL phones and tablets equally, but let's look at two top smartphone models.

Apple, and most major brands, realize that 802.11ac speed is not improved by MU-MIMO. MU-MIMO provides a small benefit in very high density areas such as hotel conference rooms. For details on the 802.11ac standard, please review the material in "802.11AC – why is it better".

The number "2x2" means the number of radio streams supported by the phone. Each stream takes one antenna, CPU time, and power. Thus, a 2x2 smart phone will have two antennas built in.

802.11AC can also be used with 1, 2, 3, 4 or 8 antenna combinations. Smartphone vendors have picked the best combination – 2x2 – for maximum performance without the extra power and space requirements. Its not just smart phones; all tablets and most laptops are also 2x2 for the same cost/benefit trade-off.
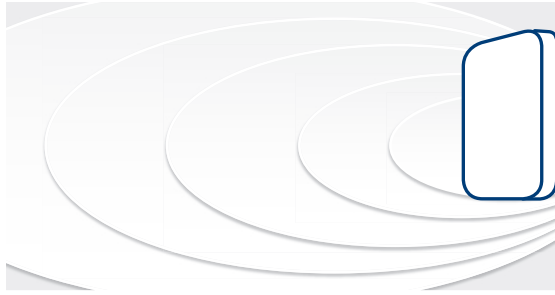
- Generally 23 sqm to 36 sqm (250-400 sqft) per room

- 3 - 7 devices per room

- 5 Mb to 10 Mb per device

The walls, floors, and fire-rated door reflect and absorb up to 20 dB of the access point signal! This creates small networks where one access point cannot cover as much area as it can in free space. For the guest room zone, a dual band 802.11**ac** 2x2 access point is perfect. It matches the guest device with 2x2 radio on both bands, and supports all the devices the guest can bring.

It's also important to consider size, cost and installation. Guest rooms will always require more access points than other areas of the hotel, and room aesthetics are very important. The Cambium e430w has three different mounting options; over a wall jack, on a flat wall, or table top. For easy installation, high performance and low cost; the e430w is ideal for hotel guest rooms and dormitory housing.

As voice assistants, smart TVs and other connected devices enter the guest room, the need for greater isolation between rooms and better control of RF interference will be critical. Installing a personal, private and isolated network inside each guest room is the best way to provide an exceptional "do not disturb the guest" Wi-Fi experience.

cnPILOT ₑ430W

- 802.11**ac**, 2x2:2:2

- Dual band, 2x2 on each

- Integrated BLE radio

- Integrated Captive Portal

- Location API

- Automatic RF Management

- Enhanced Roaming

- List price: $295 USD

Benefit to the Hotel

- Low cost

- Advanced features

- Customer loyalty

Benefit to the Service Provider

- Fast, repeatable installation

- Management API

- Enterprise class services

Benefit to the Hotel Guest

- Support any consumer device

- Seamless roaming

- "at home" Wi-Fi experience

Automatic RF Management

Home access points are not aware of the RF signals from neighbor access points. Setting up a home access point is fairly easy.

A hotel has hundreds of access points and hundreds of guests devices coming in each day. Intelligent algorithms running in the edge access point is needed to simplify installation configuration, and optimize the RF in real-time.

Cambium Networks access points scan a little at a time, all the time, on all the Wi-Fi channels. Using this data, Cambium Networks access points will select the optimal channel to avoid interference and improve reliability.

Conference rooms are configured for side-by-side tables during a sales training, or opened up to host a wedding reception with 300+ guests. All in the same day. We must plan for a variety of devices; laptops, tablets and smart phones.

An 802.11ac 4x4 access point supports a high density, dynamic network in important ways:

- Delivers more RF power to the mobile device. A 4x4 access point will transmit 3 dB more power than an equivalent 2x2 access point.

- More efficient beamforming for greater signal strength and mobile device isolation. Standardized in 802.11ac, beamforming isolates transmission to a particular client, providing greater data rates (speed) at greater distance.

- For mobile devices that support it, 4x4 MU-MIMO (multi-user MIMO) can increase the density by up to 250%

- Four antennas receive the guest device signals on all four antennas and select the best signals to decode (diversity and maximal ratio combining).

- Generally 100 to 300 sqm (1000-3000 sqft) per access point

- 0 – 1000s of devices

- 5 Mb to 50 Mb per device

cnPILOT e600

- 802.11AC, 4x4:4:3

- Dual band, 4x4 on each

- High density networks

- Integrated Captive Portal

- Location API

- Automatic RF Management

- Enhanced Roaming

- List price: $340 USD

Opportunistic Key Cache, 802.11R, and Enhanced Roaming

You never know what mobile device a guest will bring. Since not all mobile devices support every roaming method, Cambium Networks includes multiple algorithms to help a wireless client roam to the best access point.

Opportunistic key caching (OKC) pre-shares the pairwise master key (PMK) between neighbor access points. This allows a compatible mobile device to bypass the full EAP authentication time and use the pre-shared PMK. The downside is that OKC is only supported by WPA2 Enterprise authentication.

802.11R is another method used to roam quickly between access points. 802.11R can be used with more security protocols than OKC, and it does not require the controller interaction.

Enhanced Roaming is an advanced feature that monitors the signal levels of the mobile device, and forces the mobile device to disconnect and search for a better access point.

Leisure travelers will expect great Wi-Fi to roam from the guest room to the poolside. Being on vacation still means staying connected with family, friends and work.

Cambium Networks offers three outdoor rated access points with IP67 rating that can stand up to extreme temperature and environments. All three access points use integrated antennas to simplify installation and maintain a slim and unobtrusive design.

With PoE-out on GE2, each e50x series access point can power an IP camera, a Cambium backhaul subscriber module, or any IP and PoE enabled device that supports 802.3af.

cnPILOT e500

Omni directional antenna designed for pole mount applications where Wi-Fi needs to cover areas in front and back of the access point.

- 802.11ac dual band, 2x2:2:2

- 29 dBm EIRP

- 360 degree coverage

- Included Wall or Pole mount bracket

- POE-out on GE2, advanced MESH

cnPILOT e501S

120 degree dual polarized, sector antenna. Direct RF energy away from a wall across a 120 degree arc.

- 802.11ac dual band, 2x2:2:2

- 29 dBm EIRP

- 120 degree antenna coverage

- Included Wall or Pole mount bracket

- POE-out on GE2, advanced MESH

cnPILOT e502S

Narrow beam 30 degree sector antenna designed for high density in a targeted area.

- 802.11ac dual band, 2x2:2:2

- 29 dBm EIRP

- 30 degree antenna coverage

- POE-out on GE2, advanced MESH

- Cambium Enterprise AP feature set

HOW IS ALL THIS NETWORK MAINTAINED AND MANAGED?

Installing access points is really the easy part. When done properly, the network will last for many years and provide exceptional guest experience. Software is required to monitor for errors, optimize in realtime, and collect important network statistics.

Cambium Networks is the first Wi-Fi vendor to offer no-cost, holistic network management software that can be used from a Cloud account, or installed on a local server at each hotel.

Per access point management license:	0
Initiation fee per Cloud account:	0
On-premises management software:	0
Per AP software updates entitlement:	0
Per AP support:	0
Total Management Cost:	**0**

cnMAESTRO

Designed with the latest HTML5 web technology and a high performance database, cnMaestro can scale to 10,000 access points on a single on-premises server.

KEY FEATURES OF cnMAESTRO:

· Flexible deployment: Cloud or on-Premises

· Multi-tier and Multi-user manages multiple properties and provides easy work flow coverage

· Network diagnostic tools including packet capture, throughput testing and built-In Wi-Fi scanning to locate all access points that could be interfering with the network

· Built in Guest Access – configure globally, enforced at the edge access point

· API for integration into OSS/BSS systems for 3rd party management entities

· Seamless roaming across all Cambium access points; from guest rooms, conference rooms,

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