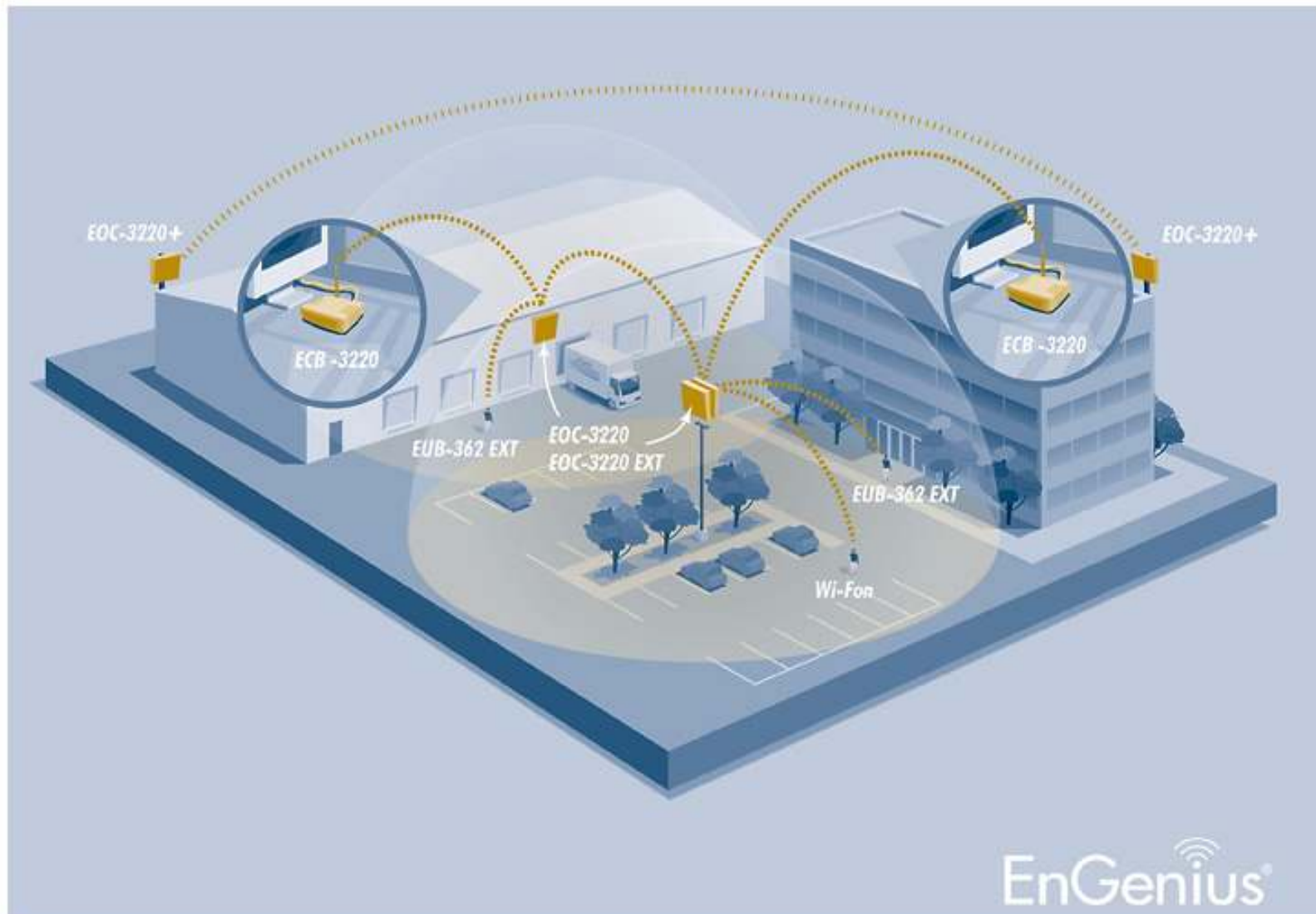


Designing and Planning EnGenius Wi-Fi Networks



Basic Terminology

- **Access Point (AP)**
Allows wireless client devices such as laptops to connect to a wireless network using Wi-Fi.
- **Client Bridge (CB)**
A device that connects an Ethernet network or device directly to a wireless access point

Basic Terminology Cont.

- **Ad-Hoc (point-to-point) Mode**

In ad-hoc mode, each client, is peer-to-peer, and requires no access point.

- **Infrastructure (point-to-multipoint) Mode**

The infrastructure mode requires the use of an access point (AP). In this mode, all wireless communications between clients are through the AP no matter the location of the AP.

Basic Terminology Cont.

- **RF Site Survey**

A site visit to run tests to determine the presence of RF interference and identify optimum installation locations for access points preferably with a spectrum analyzer.

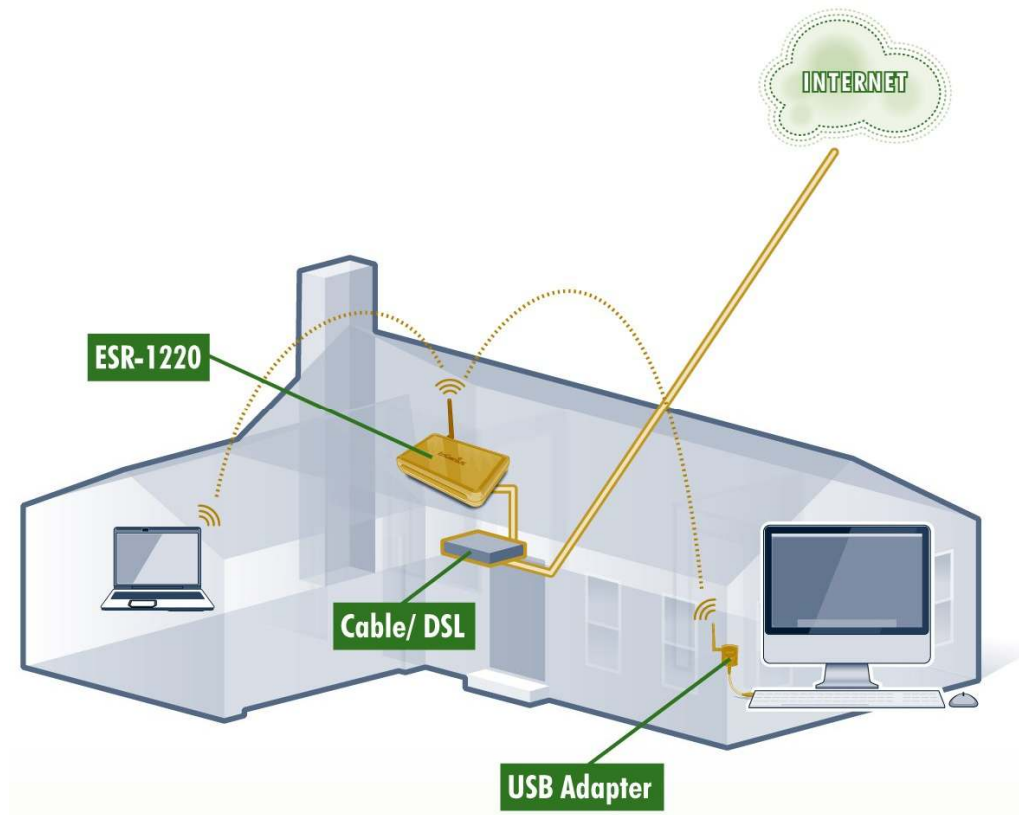
Other considerations are user density and bandwidth requirements.

Wi-Fi Standards

- 802.11**b**
2.4GHz, 11Mbps throughput, DSSS modulation
- 802.11**a**
5GHz, 54Mbps throughput, OFDM modulation
- 802.11**g**
2.4GHz, 54Mbps throughput, OFDM modulation
- 802.11**n**
2.4GHz and 5GHz, 300Mbps throughput, MIMO and Spatial Multiplexing, 20-40MHz channels

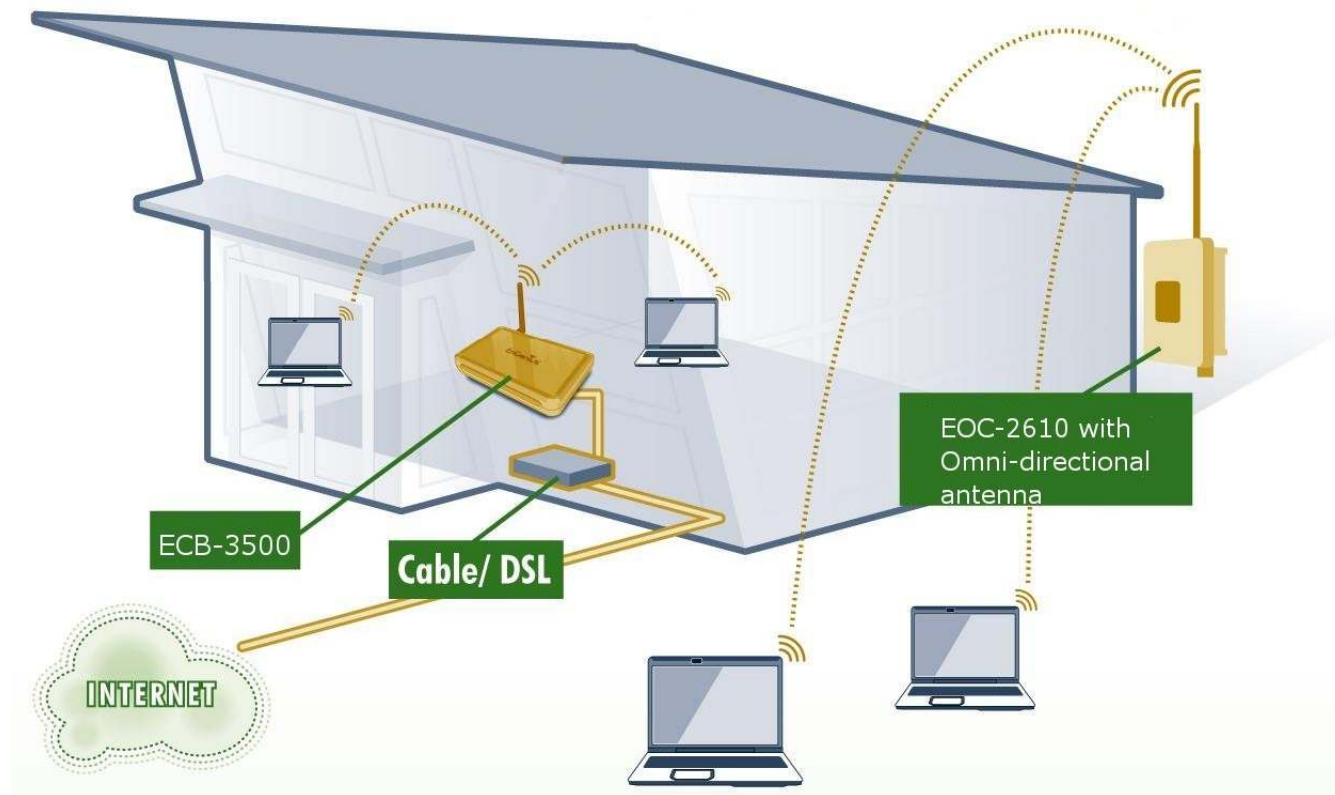
Wireless Home Network

- Small to medium sized home.



Hotspot

- Coffee shop or small office



Recommendation

Small home or apartment



ESR-1221 EXT
200mW Power



ESR-9753
150Mbps Router



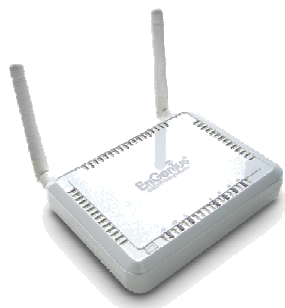
ESR-9752
300Mbps N Router



ERB-9250
Range Extender

- *Cost effective solutions*

Multimedia and Gaming



ESR-9850 300Mbps
Gigabit N Router



ESR-7750 300Mbps
Dualband N Router



ESR-9855G
Gaming Router

- *Enhanced MIMO radio technology for extended range and speed Secure Push-Button Setup*
- *802.11E QoS optimizes multimedia streaming*
- *Easy to use installation wizard for quick setup*

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USB Clients

Small home or apartment



EUB-3701 EXT
Removable Antenna



EUB-9703
150Mbps

Long Range

High Power

802.11n



EUB-362 EXT
200mW



EUB9603H
600mW



EUB-9706
300Mbps N



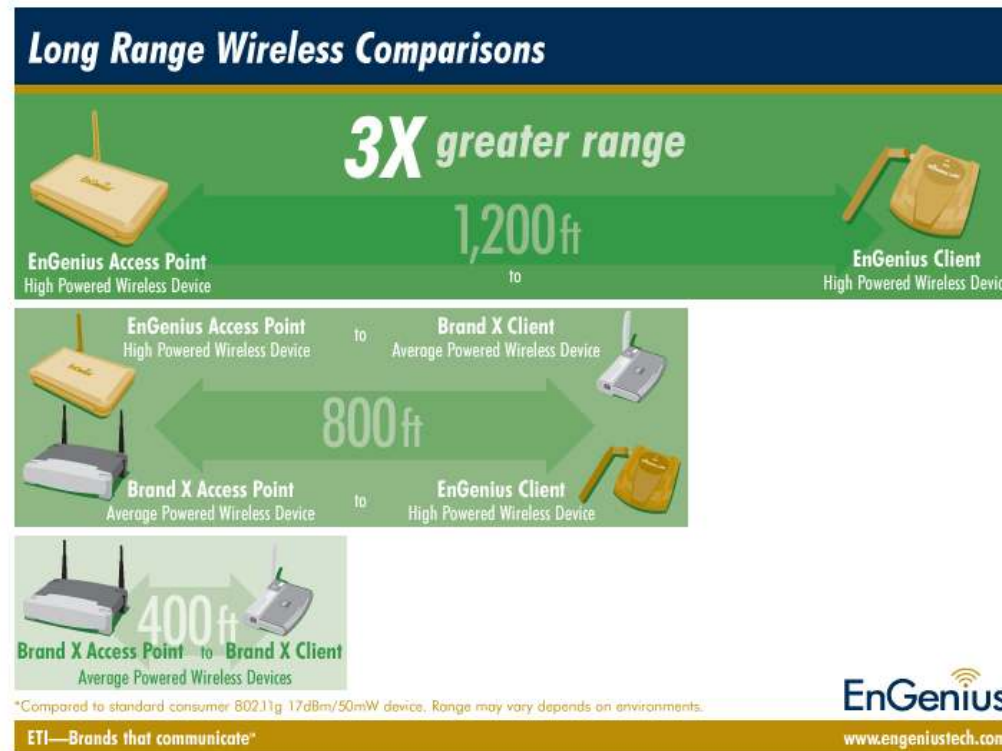
EUB-9801
300Mbps
Dualband N

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Business Class Models

Higher RF transmit power and sensitivity.



Power over Ethernet capability

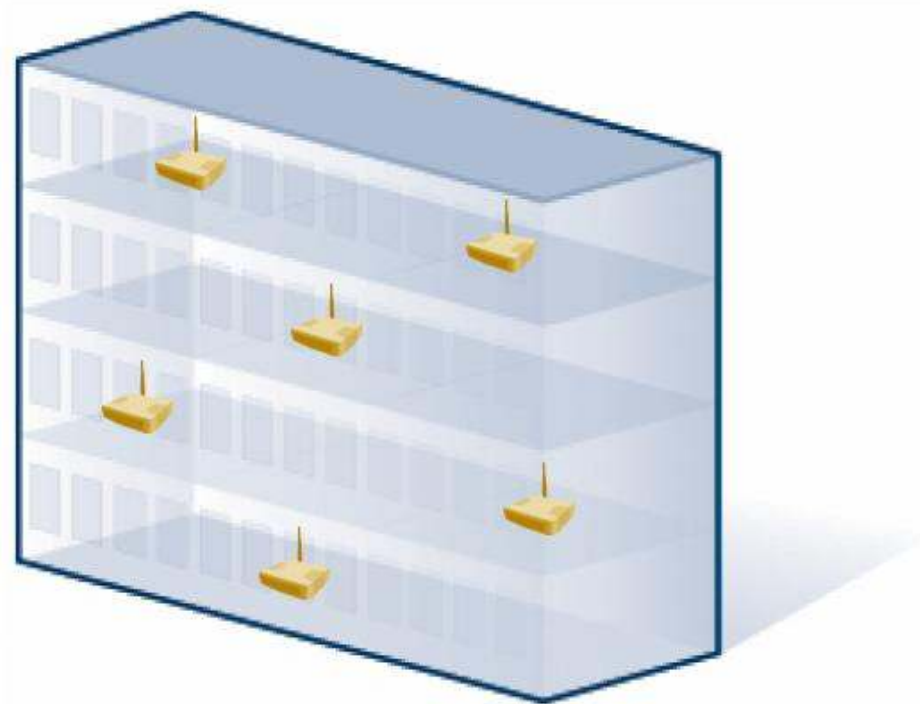
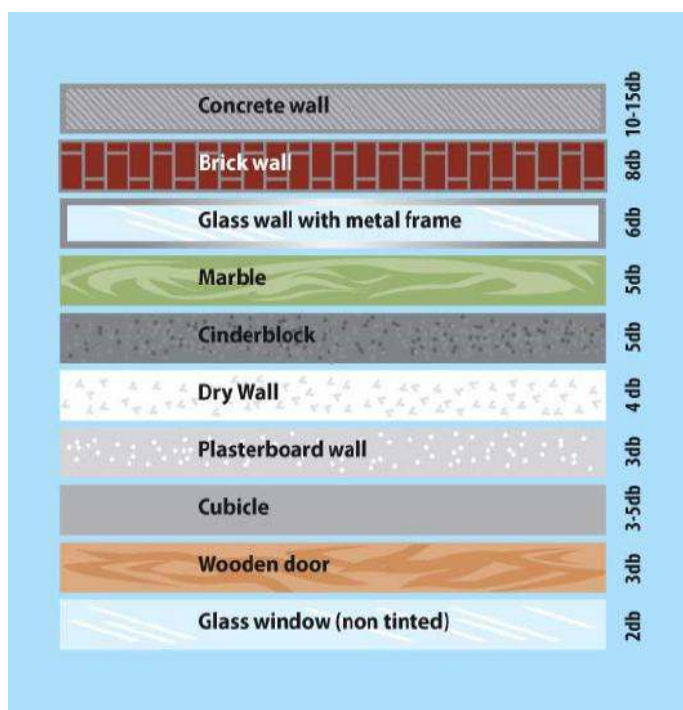


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Larger Coverage Areas

- High transmit power and receive sensitivity means less APs.
- dB Loss is a function of material
- Brick or concrete walls: 15 rooms per AP.
- Drywall: 25 rooms per AP



Recommendation

High powered 802.11g AP

- EAP-3660
- ECB-3500



802.11n AP

- EAP-9550
- ECB-9500



ECB-3500

- 802.11g
- 600mW RF output
- Dual diversity antenna
- 802.3af PoE compatible
- Multiple SSID (AP mode)
- Supports VLAN tagging
- WMM QoS
- 7 operation modes



EAP-3660

- 802.11g
- 600mW RF output
- Discreet enclosure design
- 4dBi internal antenna
- 802.3af PoE compatible
- Multiple SSID (AP mode)
- Supports VLAN tagging
- WMM QoS



ECB9500

- 802.11n
- Gigabit Ethernet port
- 802.3af PoE compatible
- Multiple SSID (AP mode)
- Supports VLAN tagging
- WMM QoS
- 7 operation modes



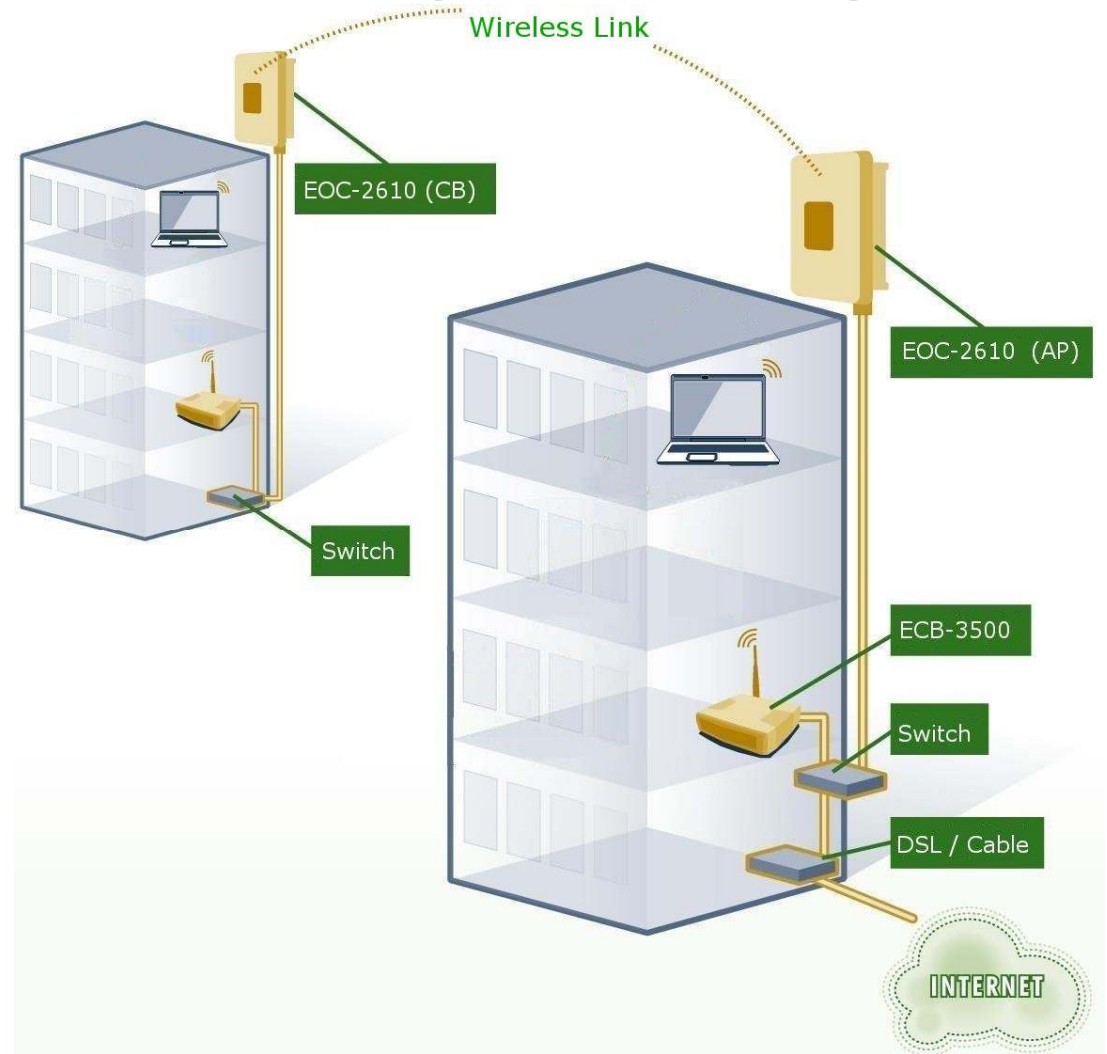
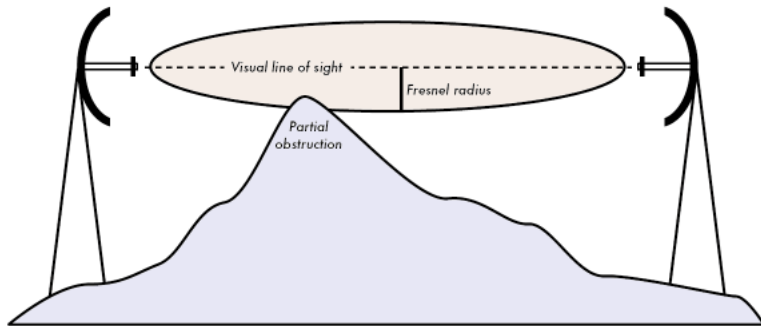
EAP9550

- 802.11n
- Discreet enclosure design
- 4dBi MIMO smart antenna
- 802.3af PoE compatible
- Multiple SSID (AP mode)
- Supports VLAN tagging
- WMM QoS



Point-to-Point Long Range

- Directional antennas
- Clear line of sight



Recommendation

802.11g Outdoor AP/CB

- EOC2611P

802.11a Outdoor AP/CB

- EOC-5610



EOC2611P

- IP65 rated outdoor enclosure
- 802.11g
- 600mW RF output
- 24V PoE
- 10dBi Selectable Vertical or Horizontal Polarity
- RP-SMA external antenna connector (hardware switch)
- Metal clamp for mounting



EOC-5610

- IP65 rated outdoor enclosure
- 802.11a/g
- 600mW RF output
- 5dBi 2.4GHz, 13dbi 5GHz internal antenna
- 24V PoE
- RP-SMA external antenna connector (hardware switch)
- Metal clamp for mounting

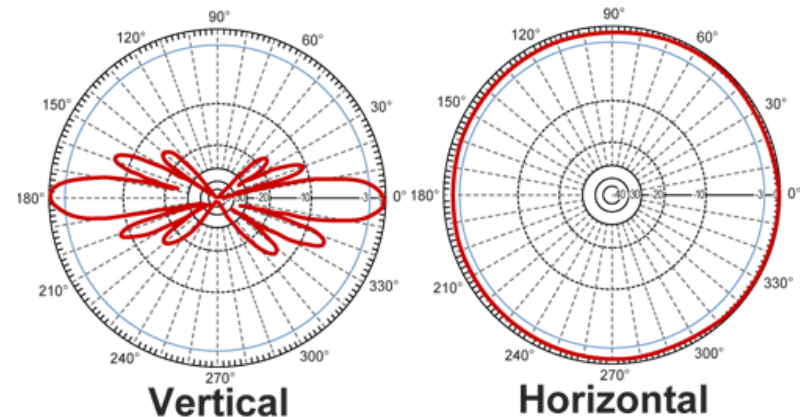


Antenna Options

How the device is used determines what kind of antenna is needed.

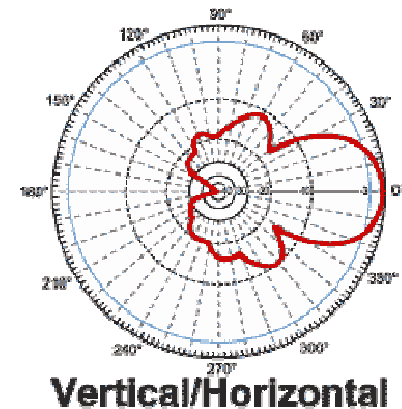
Omni-Directional

- Best used where AP and clients are at the same elevation
- Flat, circular radiation pattern



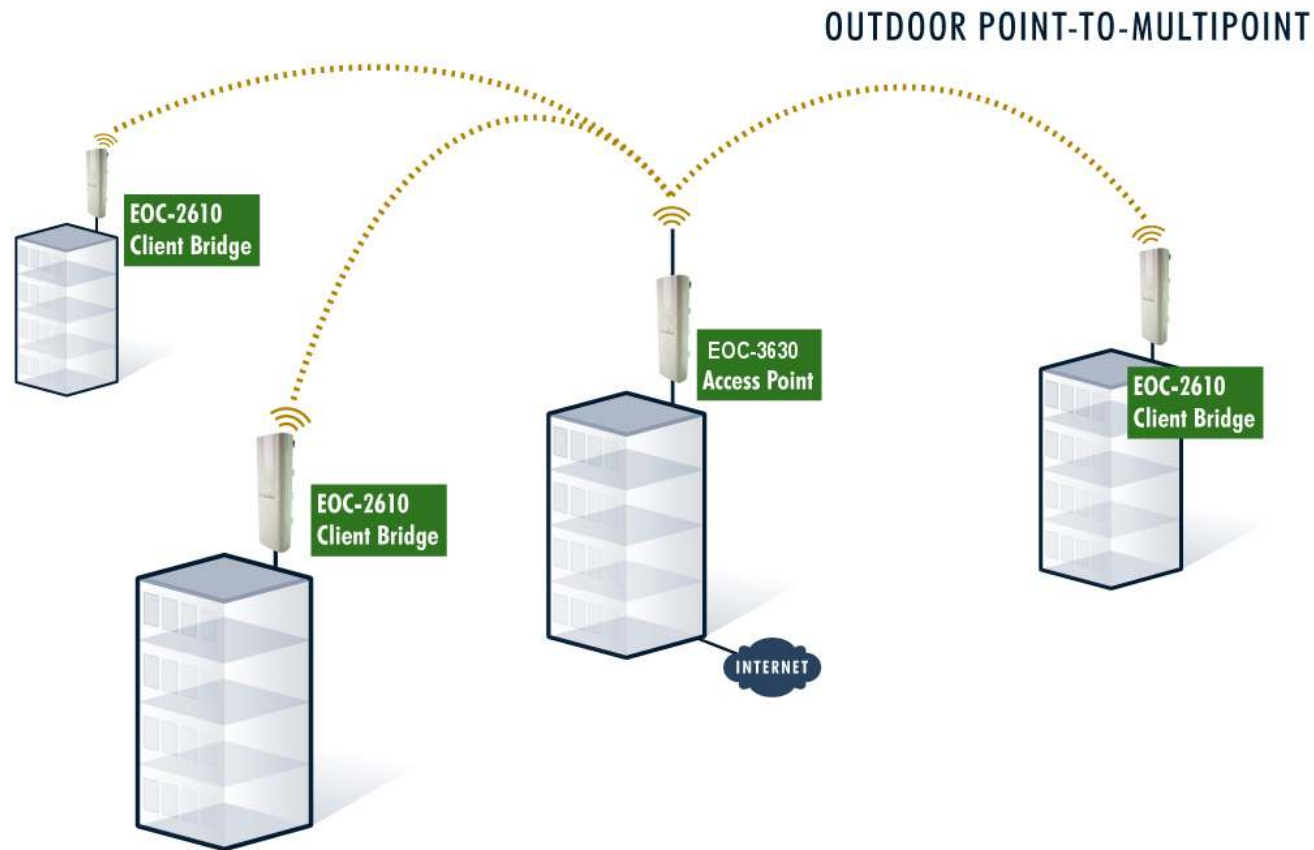
Directional

- Key to long range links
- Focused beam width
- Can go miles with **clear line of sight**



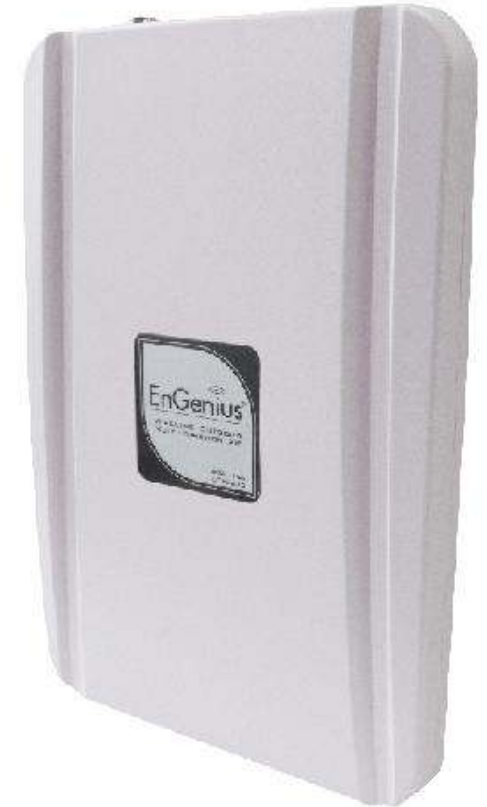
Point-to-Multipoint Outdoor

- Omni-directional antenna on AP
- Directional antennas on CBs.



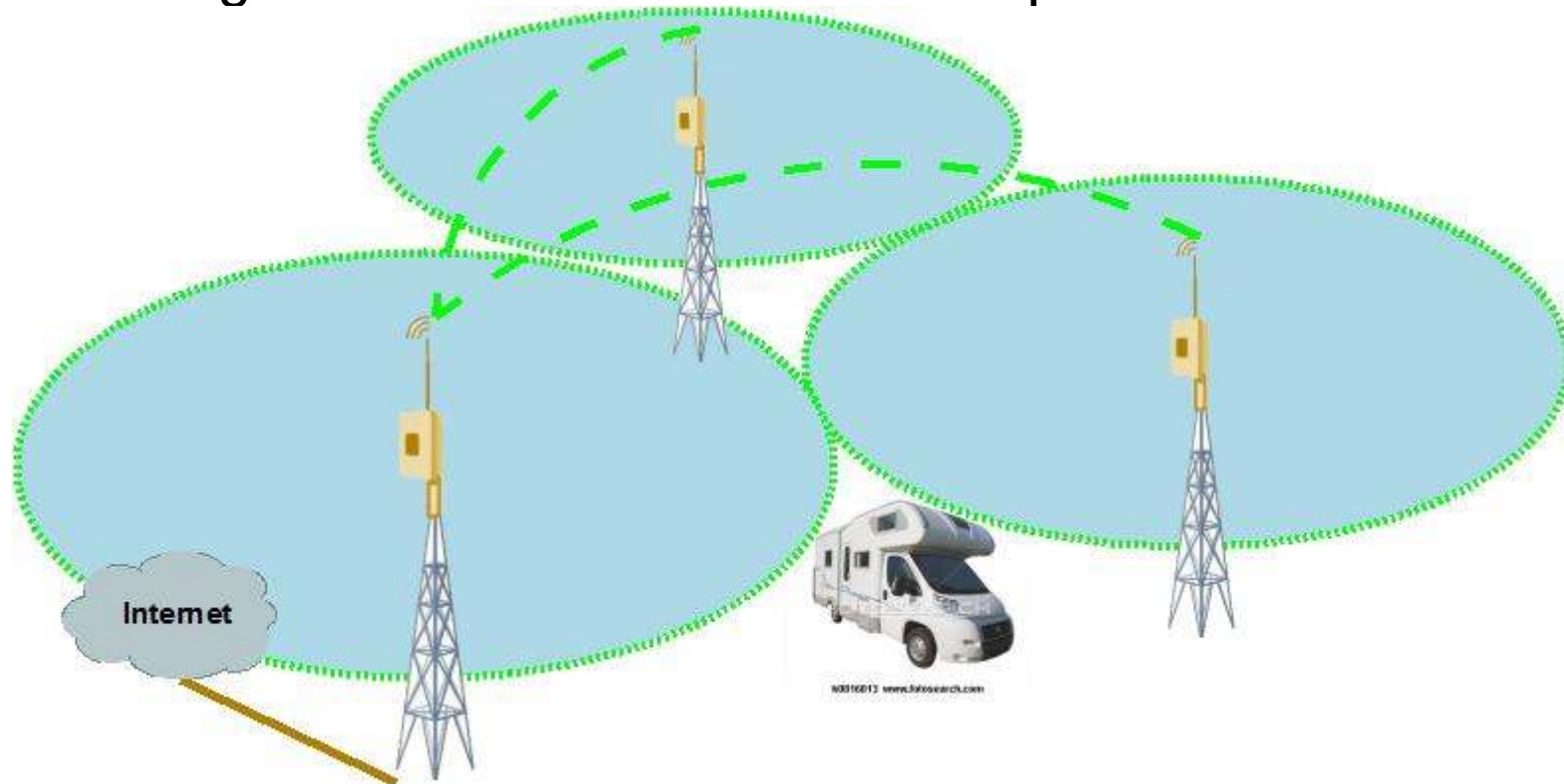
EOA-3630

- IP65 rated outdoor enclosure
- 2.4GHz 600mW
- Type-N RF Connector
- 24V PoE
- Wall or mast bracket



Outdoor Hospitality

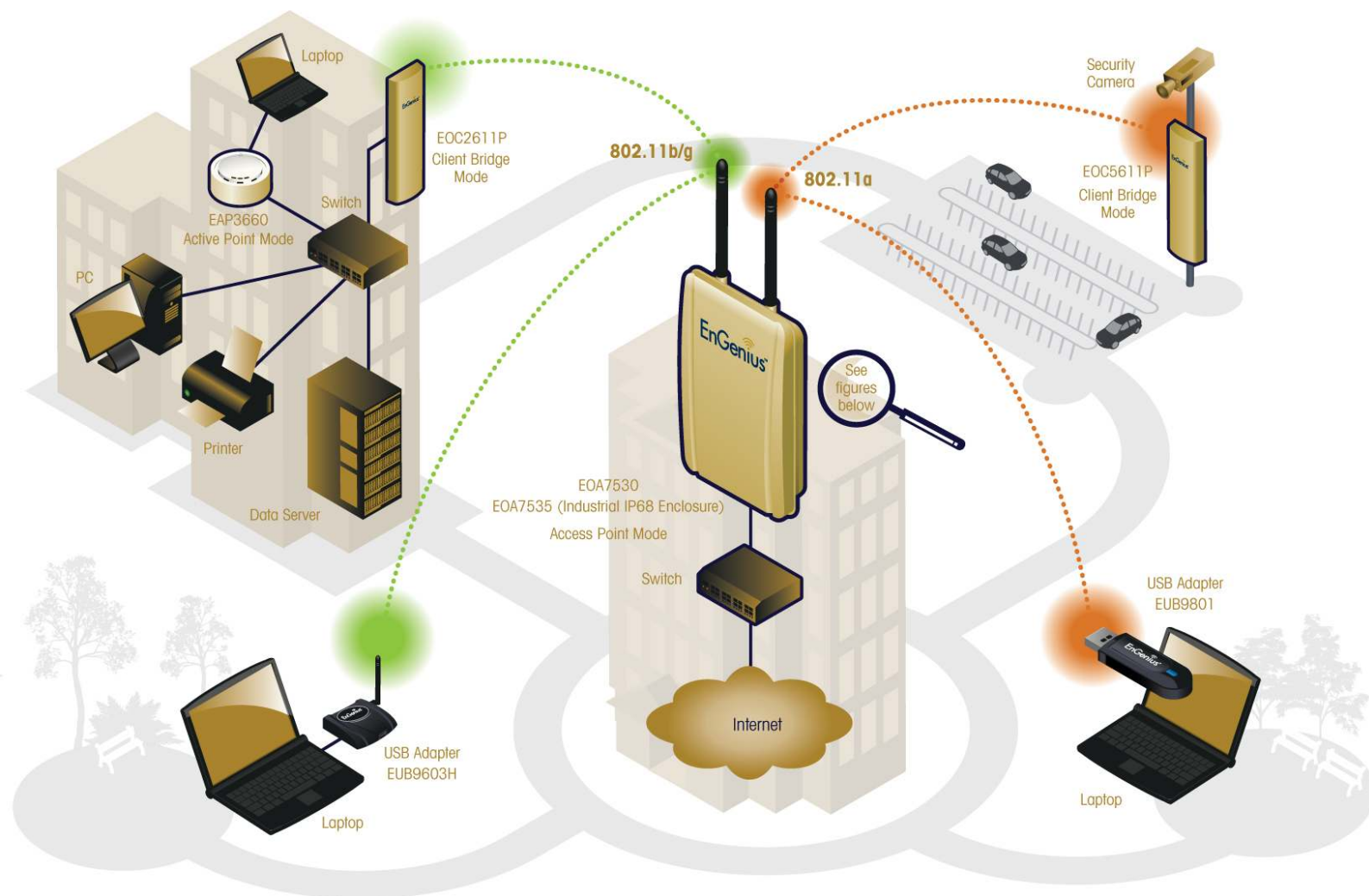
- RV Parks, Marinas, Campuses
- Dual Radio Repeaters to separate backhaul traffic
- Running data cables is not an option.



Recommendation

Dual Radio AP

- EOR-7750
- EOA-7530
- EOA-7535



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EOR-7750

- IP65 rated outdoor enclosure
- Radio 1
 - 2.4GHz / 5GHz 600mW
 - Type-N Connector
- Radio 2
 - 2.4GHz 802.11n
 - 6dBi internal antenna
- 24V PoE
- Wall or mast bracket



EOA7530

- IP65 rated outdoor enclosure
- Radio 1
 - 5GHz 600mW
 - Type-N Connector
- Radio 2
 - 2.4GHz 600mW
 - Type-N Connector
- 48V PoE
- Wall or mast bracket



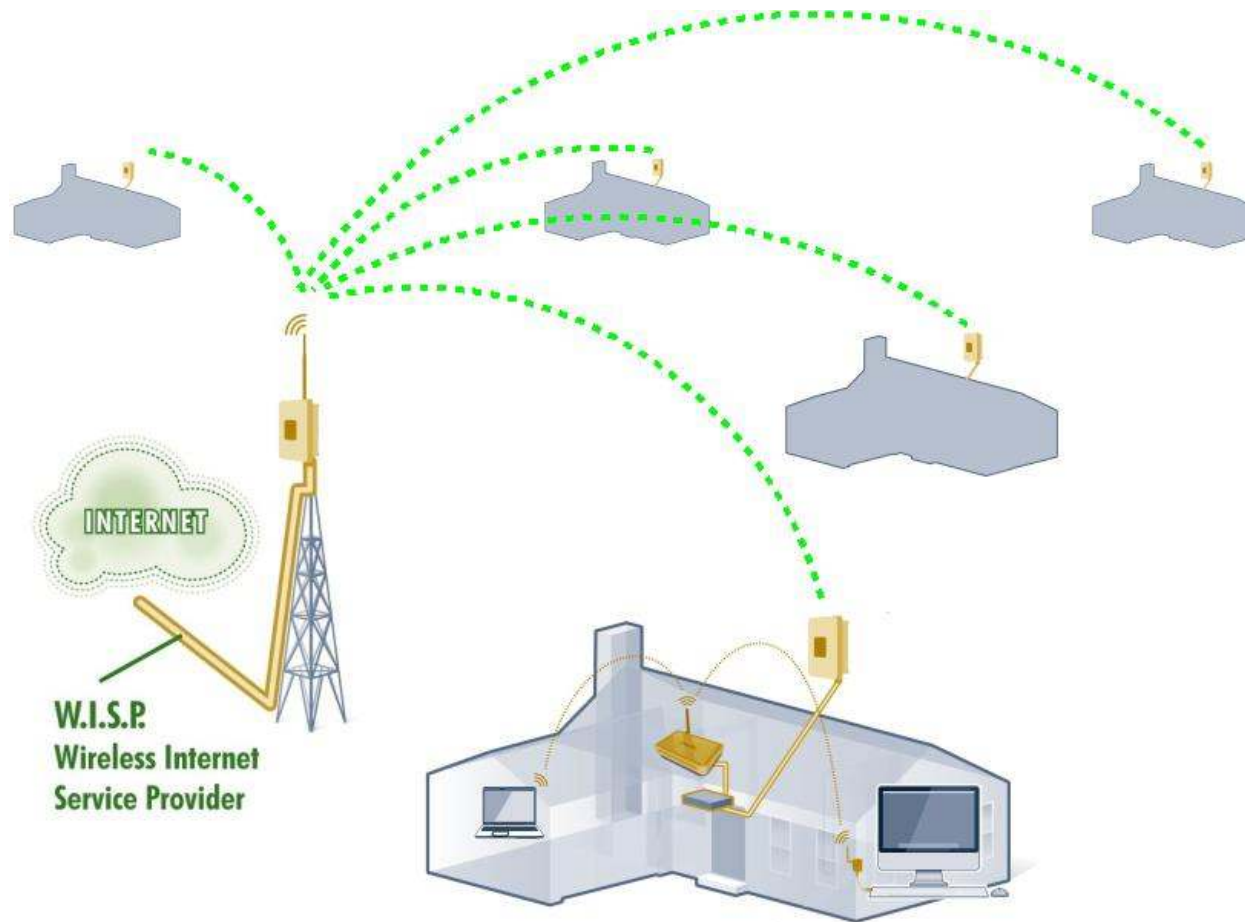
EOA7535

- IP68 rated outdoor enclosure
- Radio 1
 - 5GHz 600mW
 - Type-N Connector
- Radio 2
 - 2.4GHz 600mW
 - Type-N Connector
- 48V PoE
- Ethernet Surge Arrestor
- RF Lightning Protector
- Wall or mast bracket



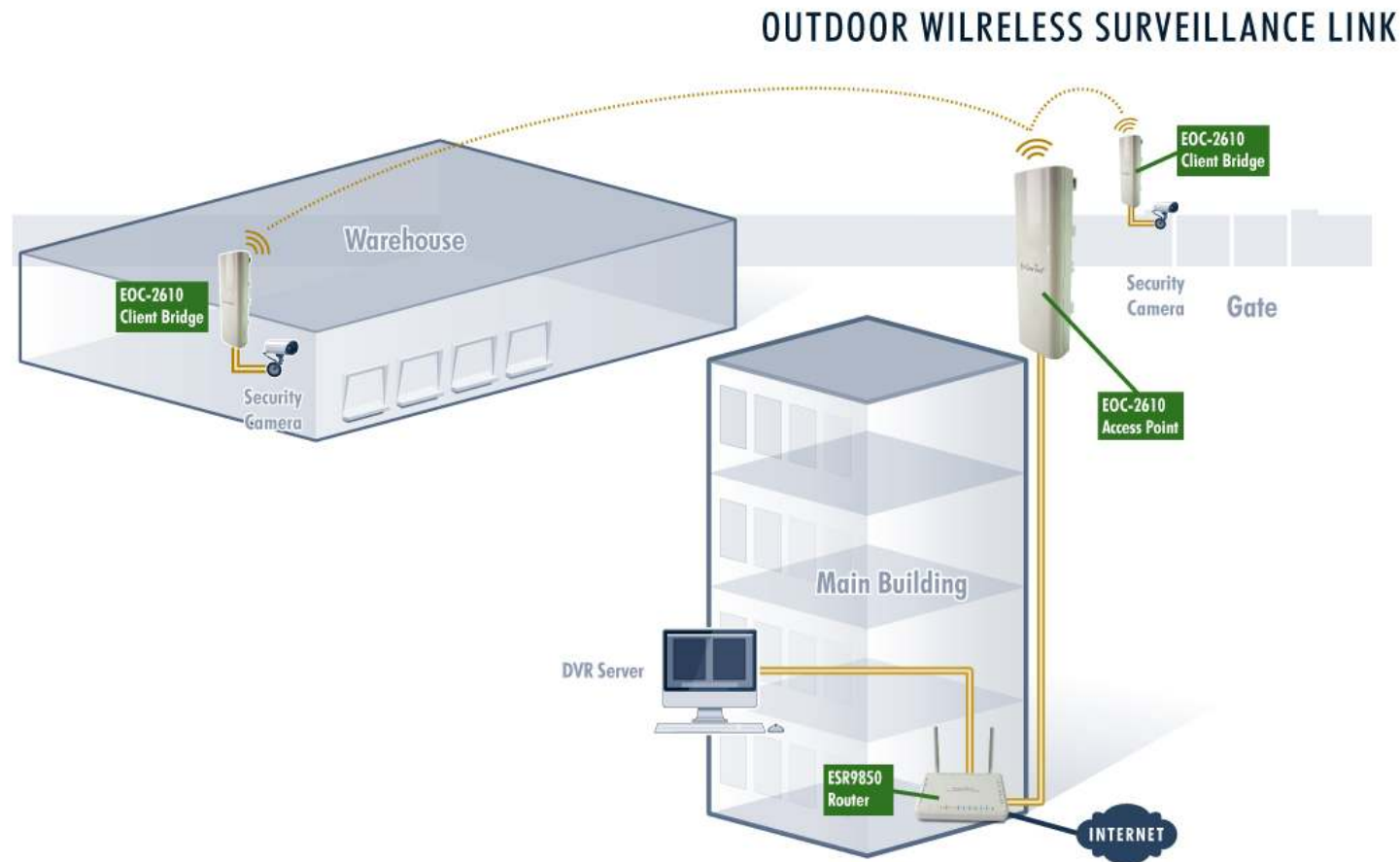
Applying Concepts for WISP

- EOC2611P configured in client bridge mode deployed as CPE devices



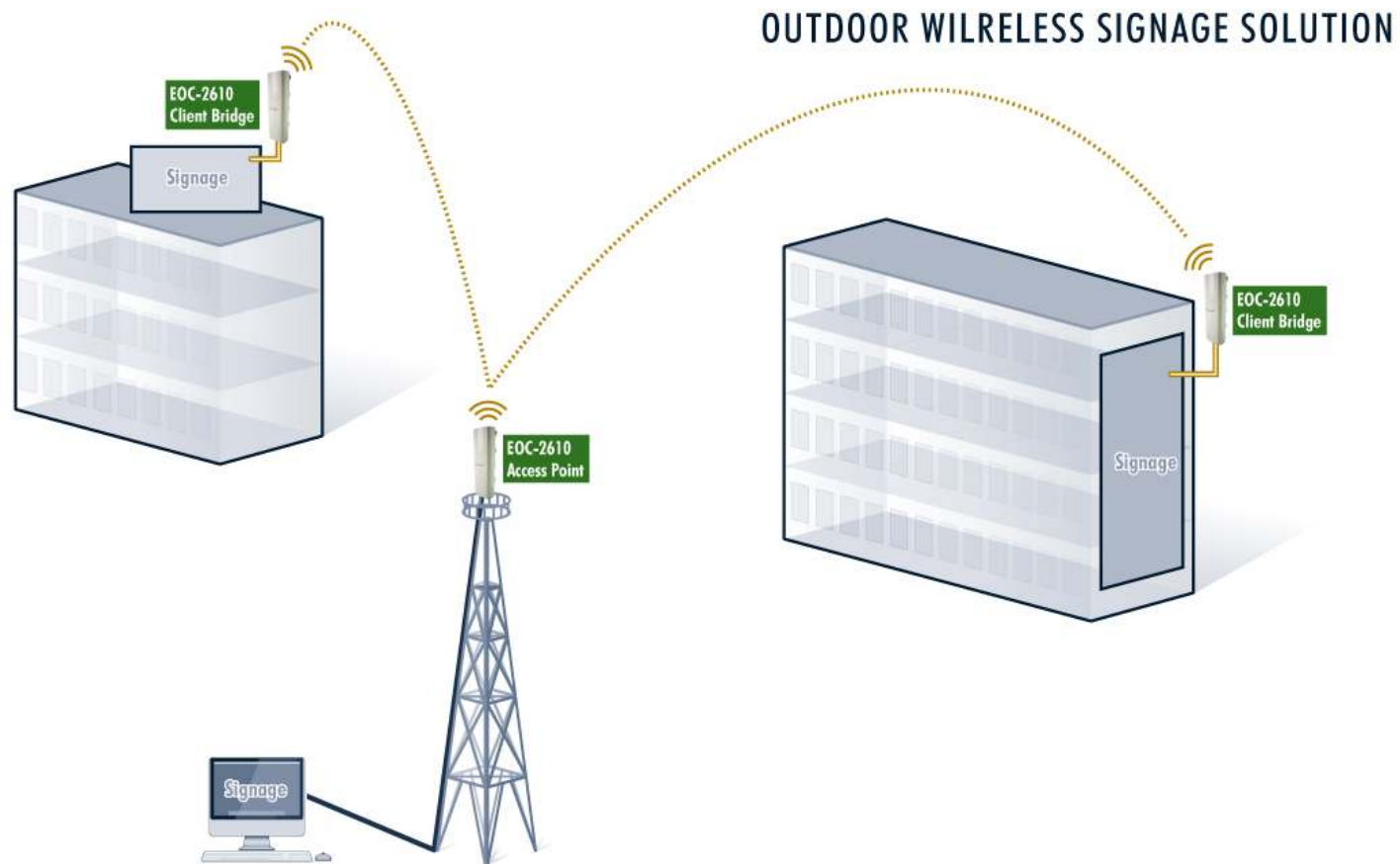
Applying Concepts for IP Security Cameras

- EOC2611P configured in client bridge mode for security cameras.



Applying Concepts to Any Ethernet Device

- EOC2611P configured in client bridge mode to connect different types of Ethernet devices.



Various Client Bridge Examples

- Client bridge mode to connect different types of Ethernet devices to an AP.



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