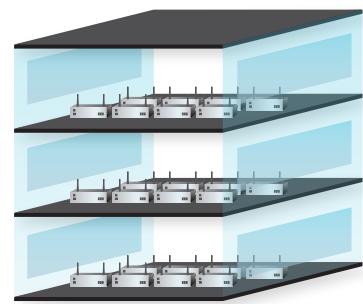


INDEPENDENT (FAT) ACCESS POINTS



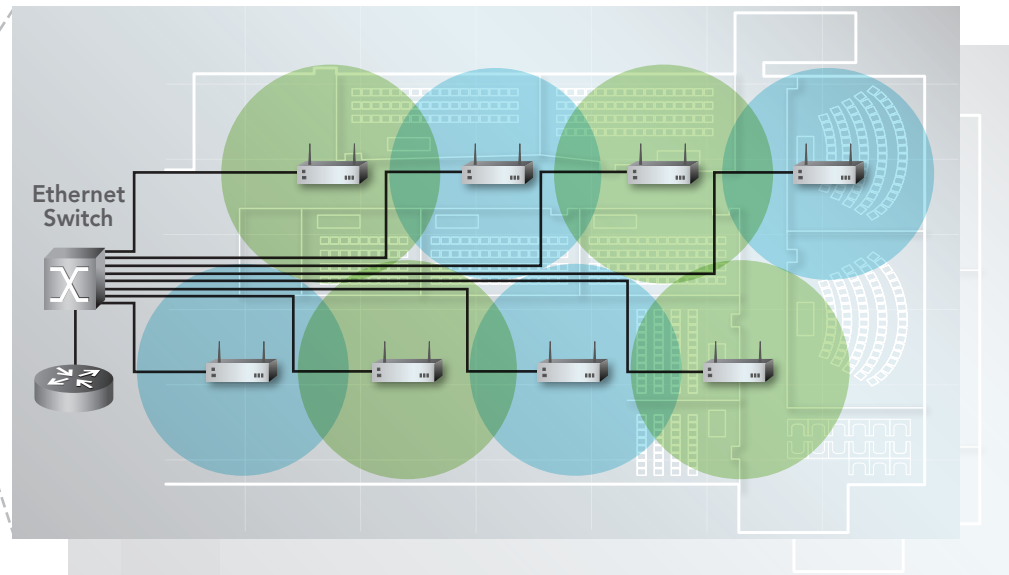
1st Generation

1st generation Enterprise Wi-Fi technology was designed to be “standalone” and to directly connect into the Wired network. Independent Wi-Fi Access Points were intended to be used in small numbers and are primarily used to provide basic connectivity and coverage for data applications in public use areas. Issues with managing disparate devices and scaling to large wireless networks led the market away from this model to the 2nd generation.



Attributes

Medium Range
1-2 Radios per Cell – Moderate Client Capacity
Individually Managed
No RF Management
Standards-based Roaming
Capacity per Cell: 108Mbps
Switch Ports Used: Medium



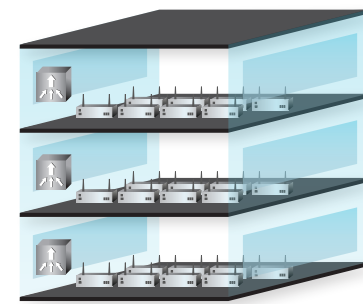
Data

DEPENDENT (THIN) ACCESS POINTS + WLAN CONTROLLER



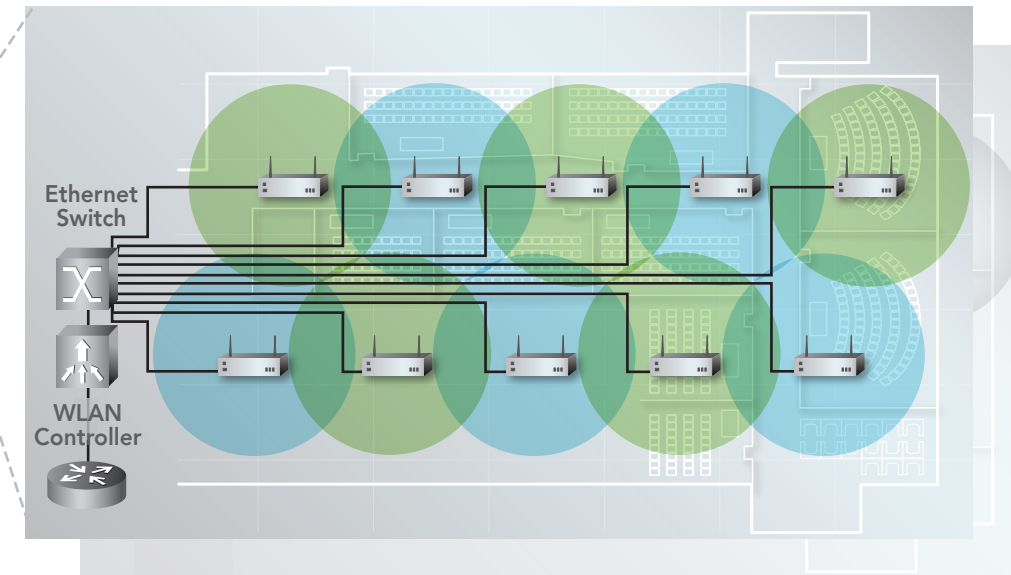
2nd Generation

2nd generation Enterprise Wi-Fi technology was designed to provide broad coverage, but operate parallel to the Wired network. Dependent Wi-Fi Access Points were intended to be used in large numbers to deliver moderate capacity and coverage for data applications to a large area. 2nd generation Wi-Fi technology was characterized by strong security, centralized management, and basic RF management such as dynamic channel assignment and flexible power settings. The advent of high performance 802.11n exposed the network choke point created by this architecture sending all traffic to a centralized controller. The market has since began to move switching and intelligence back out towards the network edge.



Attributes

Short – Medium Range
1-2 Radios per Cell – Moderate Client Capacity
Centrally Managed
Basic RF Management
Enhanced Standards-based Roaming
Capacity per Cell: 600Mbps
Switch Ports Used: Medium



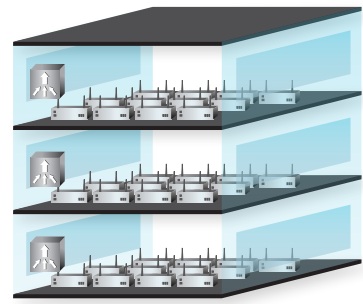
Data

ULTRA-DEPENDENT (SINGLE CHANNEL) ACCESS POINTS + WLAN CONTROLLER



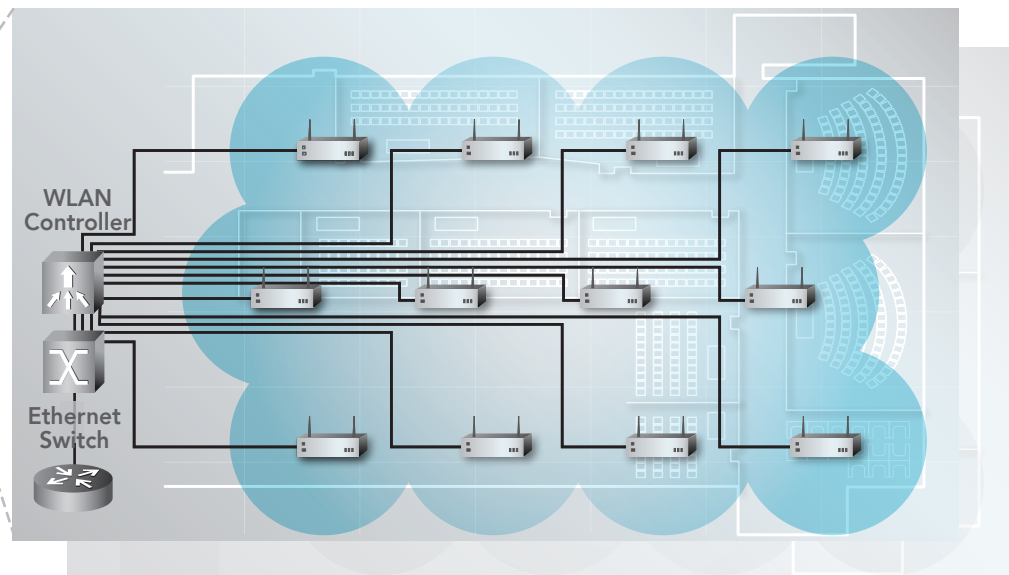
3rd Generation

3rd generation Enterprise Wi-Fi technology was designed to provide broad coverage, but as with 2nd generation Wi-Fi technology it operates parallel to the Wired network. Ultra-dependent Wi-Fi Access points were intended to be used in large numbers to deliver moderate capacity coverage for Voice and Data applications to a large contiguous coverage area. 3rd generation Wi-Fi technology was characterized by highly effective, proprietary roaming capabilities that allowed for implementation of Voice over Wi-Fi applications at the expense of limiting bandwidth to that of a single AP. The fundamental capacity limitation created by this architecture with all APs operating on 1 or 2 channels per cell has limited its broad adoption.



Attributes

Short to Medium Range
1-2 Radios per Cell – Moderate Client Capacity
Centrally Managed
Fixed RF Management
Highly Proprietary Roaming
Capacity per Area: 600Mbps
Switch Ports Used: High
All cells are assigned the same channel



Data

+

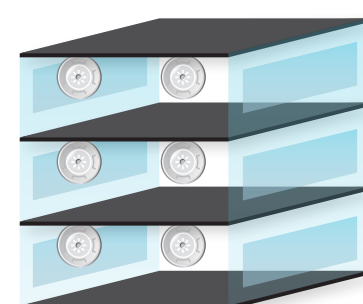
Voice

Wi-Fi ARRAY



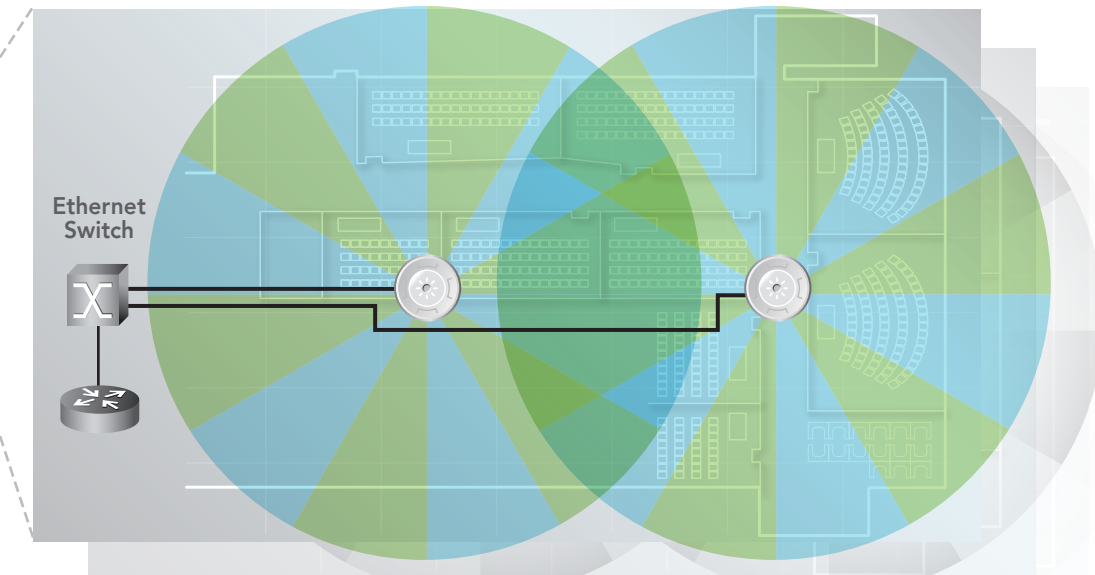
4th Generation

4th generation Enterprise Wi-Fi technology was designed to provide broader coverage than previous generations and to be a seamless extension of and directly connect to the Wired network. Wi-Fi Array technology is optimized for high capacity Voice, Video, and Data (Triple Play) applications over 802.11a/b/g/n and was designed to replace Wired technology at an Enterprise-wide level. Wi-Fi Array technology delivers longer range, greater bandwidth, support for large and dense user populations, fast roaming, advanced RF management, advanced network management, and Wired-like Quality of Service (QoS). Wi-Fi Array technology is architected like chassis based Switching and Routing components and can be upgraded in a modular fashion and realize the longer operating life common in mainstream networking components.



Attributes

Long Range
Up to 16 Radios per Cell – Very High Client Capacity
Individually or Centrally Managed
Advanced RF Management
Enhanced Standards-based Roaming
Capacity per Cell: 4.8Gbps
Switch Ports Used: Very Low



Data

+

Voice

+

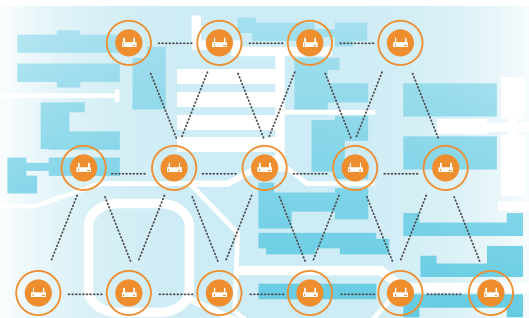
Video

MESH



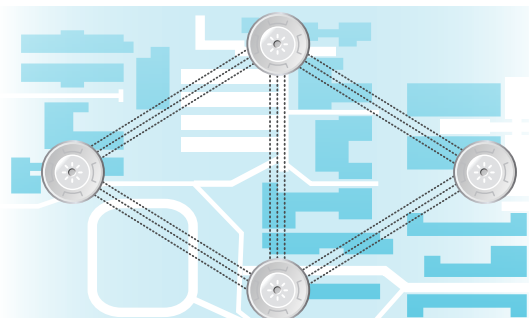
1st Generation Metro Mesh (Single Radio)

Single Radio Mesh Networks were designed to quickly deploy broad, low capacity coverage and require a large number of wired network “ingress” points.



2nd Generation Metro Mesh (Multi-radio)

Switched Multi-radio Mesh Networks are designed to deliver broad, high-capacity coverage and significantly reduce the number of wired network “ingress” points.



GLOSSARY



**Independent (Fat) Access Point**—A standalone, Access Point that provides basic integrated configuration, management and does not require a WLAN controller for operation.

**Dependent (Thin) Access Point**—A proprietary basic low-cost, low-capacity Access Point that relies on a WLAN controller for RF management, configuration, and operation and often runs the CAPWAP protocol.

**Single Channel Access Point**—A Dependent, Thin Access Point that heavily relies on a WLAN controller for decisions on every wireless packet, configuration, and operation.

**WLAN Controller**—Infrastructure device that manages Thin Access Points, provides channel selection, roaming and manages wireless stations.

**Wi-Fi Array**—A standalone, very high capacity and long range wireless network platform.

**LWAPP—Light Weight Access Point Protocol**—An IETF (Internet Engineering Task Force) standard that specifies management and control messaging from a wireless LAN switch to Thin APs.

**CAPWAP—Control and Provisioning of Wireless Access Points**—An IETF standard that defines management of thin APs via wireless LAN switches. The IETF CAPWAP working group adopted the LWAPP draft as the basis for this specification.

**Cell**—An Access Point's RF coverage area. Wireless stations in that cell can communicate with the Access Point.

**Range**—The maximum distance between two wireless devices at which they can still maintain a data connection.

**Roaming**—The ability for a mobile, wireless station to transparently change its connection between access points as it moves throughout a wireless network.

**Channel**—A designation for the radio frequency over which a wireless station and an Access Point to communicate with each other.

**Mesh Network**—Multi-point to multi-point wireless network that can cover large areas whereby each node forwards and receives packets from neighboring nodes.

SUMMARY



Architecture	Range	Capacity	Roaming	Cost	Applications
First Generation Independent (Fat) APs	Medium	108Mbps/Cell	Basic	Medium	Data
Second Generation Dependent (Thin) APs + Controller	Low	600Mbps/Cell	Good	High	Data
Third Generation Same Channel APs + Controller	Low	600Mbps/Area	Good	High	Data + Voice
Fourth Generation Wi-Fi Array	High	4.8Gbps/Array	Good	Low	Data + Voice + Video