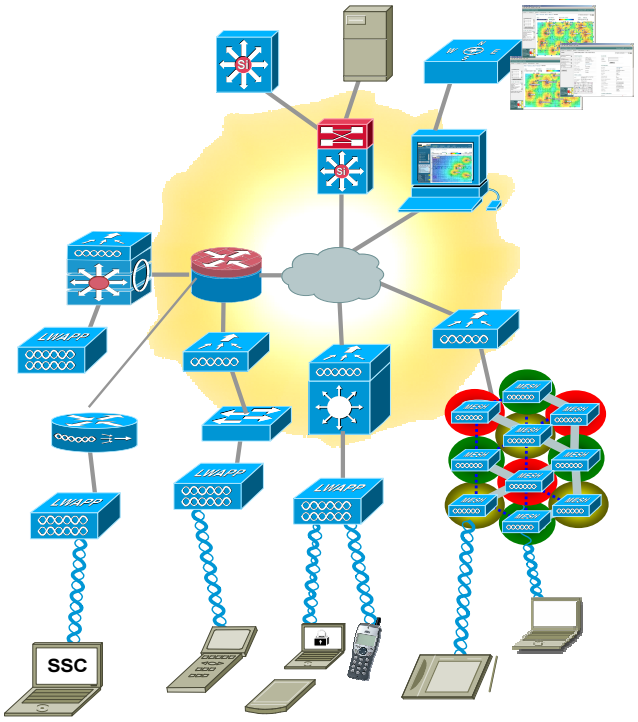
Cisco Expo 2009

Les solutions WiFi Cisco

Agenda

- Pourquoi Cisco en WiFi?
- Parlons de 802.11n et du nouveau point d'accès 1140 ABGN
- Améliorer les performances des clients existants avec les technologies Cisco M-Drive et ClientLink

Le réseau sans-fil Unifié chez Cisco
Tous les services de bout-en-bout – Une spécificité Cisco



Wireless LAN Mobility Services

Unified cellular and Wi-Fi VoIP. Advanced threat detection, identity networking, location-based security, asset tracking and guest access.

World-Class Network Management

Same level of security, scalability, reliability, ease of deployment, and management for wireless LANs as wired LANs.

Network Unification

Integration into all major switching and routing platforms. Secure innovative WLAN controllers.

Access Points

Ubiquitous network access in all environments. Enhanced productivity. Proven platform with large installed base and leading market share. Plug and Play.

Client Devices

95% of Wi-Fi silicon is Cisco Compatible Certified. Cisco SSC delivers uniform security and services for wired and wireless connections

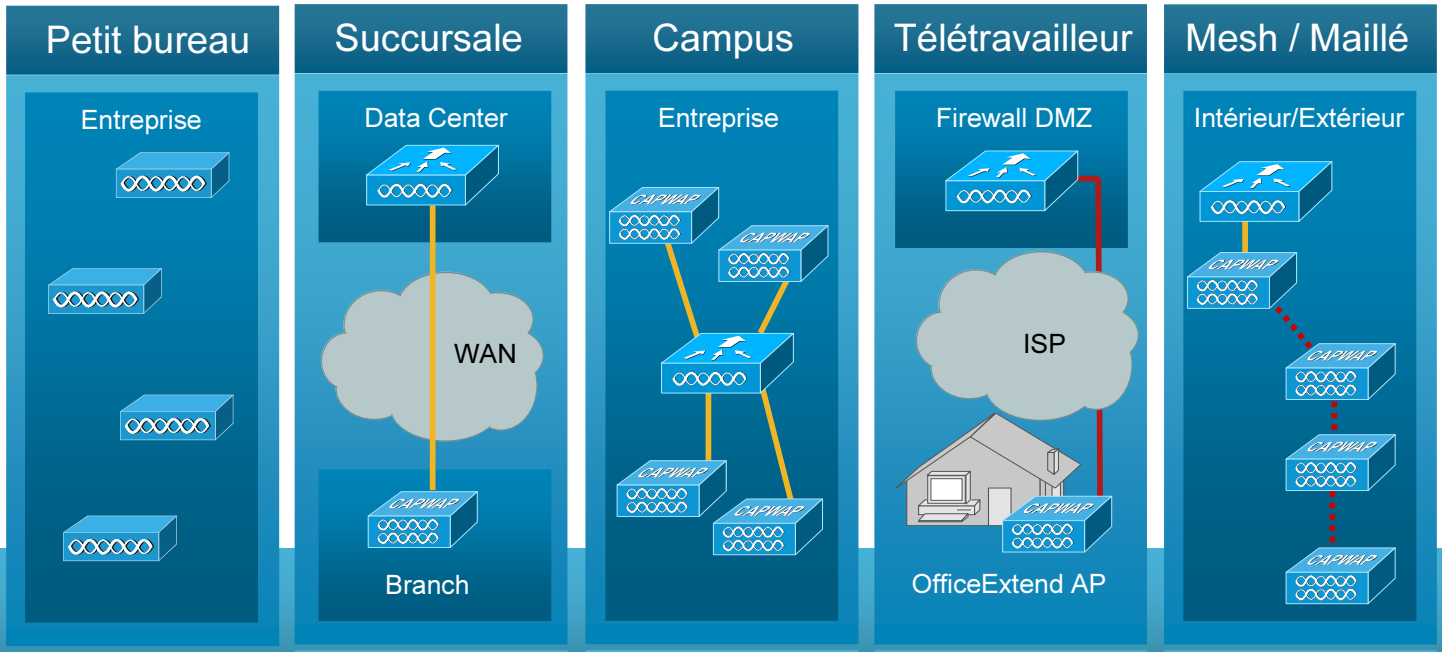
Des points forts très nombreux en WiFi

- **WLAN Market Leader** in Gartner Magic Quadrant 2008
- > 63% WLAN Market share
  - Public company with 8 times revenues of next competitor – 450+ development engineers
- Over **7 million** indoor access points sold
- Over 350 000 802.11n access points deployed
- Use Cisco WLAN Solutions:
  - 96% of the Fortune 1000
  - 9 of 10 Fortune 100 Financial Services
  - 98% of Fortune 100 Retail
  - 9 of 10 Fortune 100 Manufacturing
  - 8 of 10 Fortune 100 Energy

Unified Wireless: le couteau suisse du réseau

Evolutif, Flexible et redondant

Utilise un même contrôleur – adapté à toutes les tailles de réseaux



"Wide variety of WLAN products to service a broad set of needs (indoor, outdoor, industrial, carpeted); wide variety of form factors and price points." – Gartner WLAN Magic Quadrant

Cisco Unified Wireless Network

Wireless LAN Controllers

5508

4402 / 4404

2106/12/25

Catalyst 6500 Series Wireless Services Module (WiSM)

WiSM

Switch and Router Platforms

Integrated Services Routers WLCM

Catalyst 3750G Integrated WLC Switch

Network Unification

Features

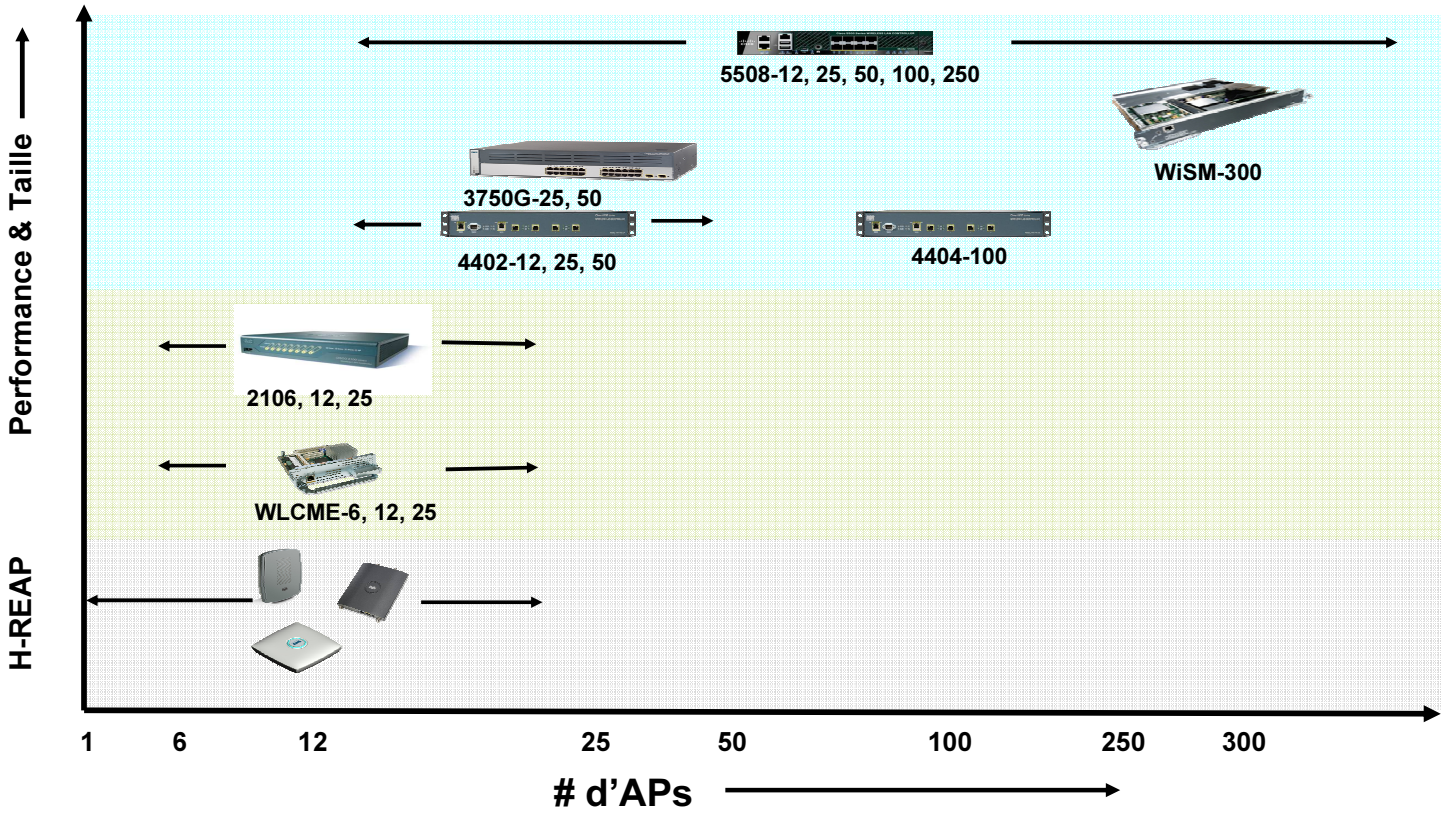
- *Enterprise scalability and reliability*
- *Real-time RF Management*
- *Multi-layered security*
- *Gestion de la mobilité*
- *Intégré ou à part dans le réseau*
- *Jusqu'à 250 APs par hauteur de rack*

Benefits

- *Up to 2100 APs per Cat 6K chassis*
- *Cost-effective solution for main, branch, and remote campuses as well as SMB*
- *Voix, données et Vidéo*
- *Intégration filaire et sans fil*
- *Jusqu'à 18 000 AP en mobilité transparente pour l'utilisateur*

Cisco Unified Wireless Network

Flexibilité de l'architecture réseau



Nouveau contrôleur sans-fils Cisco 5500

Optimisé pour le 802.11n

- En combinaison avec les points d'accès Aironet 1140 ou 1250 et le WCS 6.0, propose la solution la plus adaptée à vos déploiements WiFi nouvelle génération (802.11n)
- Système de licence flexible et évolutif
- Interopérabilité garantie avec les autres contrôleurs
- Puissance de traîtement différenciée entre les données et le contrôle
- Support de la solution OfficeExtend et du chiffrement DTLS

Specifications

Access Points	12 – 250
Clients	> 7,000
Mobility Scale	18,000 APs in Mobility Domain
Form	1 RU Appliance
Interfaces	8 GigE Ports

Cisco Unified Wireless Network

Indoor Access Points

1140 AGN

1130AG

1121BG

Indoor Rugged Access Points

1250 AGN

1240AG

Outdoor Access Points/Bridges

1520

1300

Access Points

Features

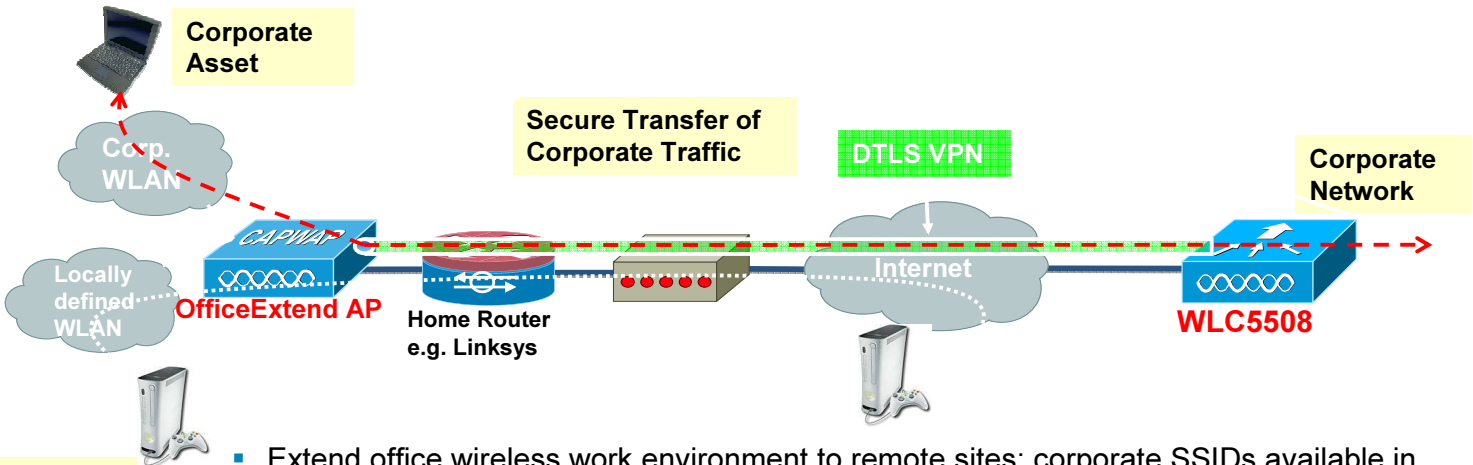
- *Industry's best range and throughput*
- *Enterprise-class security*
- *802.11n Draft 2 supporté en PoE*
- *Simultanément: surveillance des fréquences (monitoring) et gestion des clients*
- *Utilisation intérieure comme extérieure*

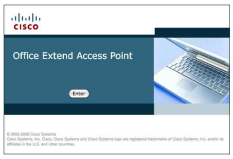
Benefits

- *Zero-touch management*
- *Supports all deployment scenarios (indoor and outdoor)*
- *From secure coverage to advanced services*
- *OfficeExtend AP mode on 1130 and 1140 for secure teleworker environment*

OfficeExtend AP

Nouvelle solution pour les télétravailleurs et les déploiements distants





- Extend office wireless work environment to remote sites: corporate SSIDs available in remote site
- Ideal for telecommuting, home-sourcing, outsourcing applications
- Quickly and securely blanket remote area with corporate WLAN: temporary work space, new branch office or acquisition etc.
- Create locally significant SSID directly on OfficeExtend AP; unique SSID can be created for each location; not managed by IT
- DTLS VPN between AP and controller

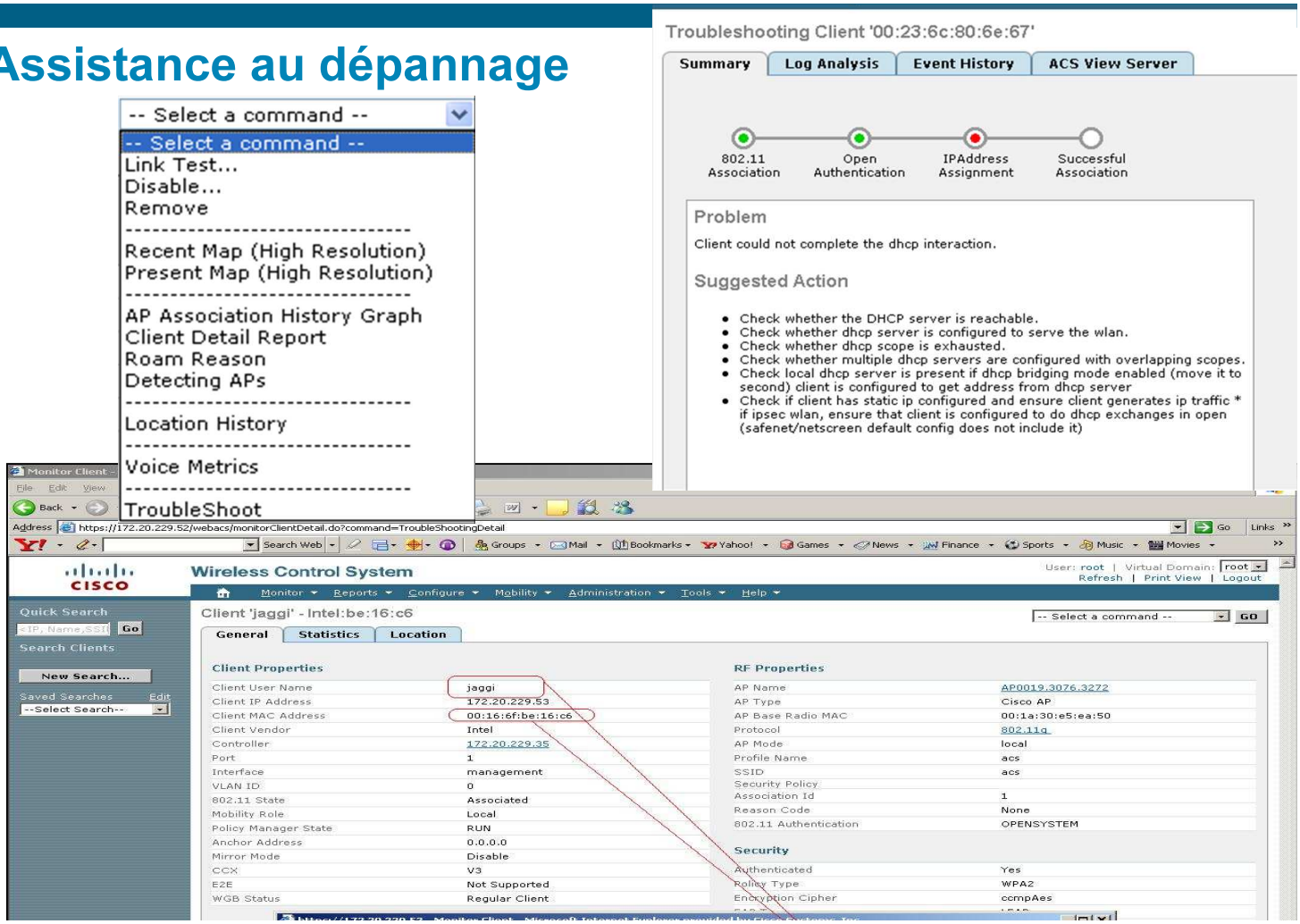
Cisco Wireless Control System (WCS)

- WCS is the management platform for Cisco's controller-based solution
- WCS sert à:
  - Planification et gestion courante
  - Visibilité en temps-réel et contrôle des fréquences
  - Politiques de sécurité et de déploiement centralisées
  - Prise en charge des contrôleurs Cisco, des APs centralisés, et des APs autonomes en IOS
  - Outil de migration automatisée des bornes (IOS -> centralisé) sans intervention physique sur site
- WCS est optionnel, mais fortement recommandé pour:
  - De multiples contrôleurs déployés avec un grand nombre d'APs
  - Les services avancés de mobilité (IDS, localisation, voix, …)
  - Intégration avec Google Map, et l'analyse spectrale pour l'identenfication des sources d'interférences
  - **Assistance logicielle au dépannage des clients**

Un management intuitif et complet

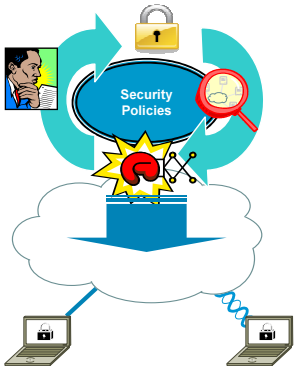
"L'ingénieur radio est dans la boîte"

Assistance au dépannage

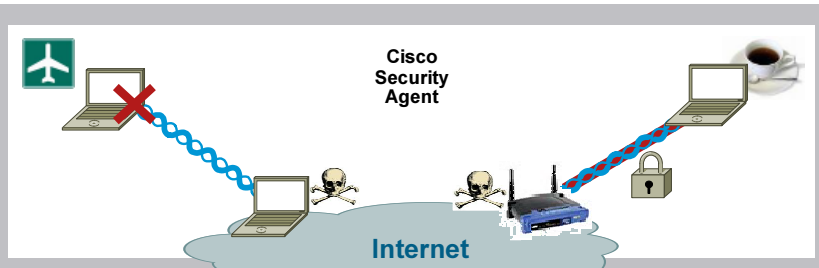


Secure Wireless 2.0 Overview

- Secure Wireless 2.0 published on Cisco.com:
  - Wireless and Network Security Integration
  - http://cisco.com/en/US/docs/solutions/Enterprise/Mobility/secwlandg20/sw2dg.html
- Focus is on integrating and extending general Enterprise network security to an Enterprise WLAN
  - Defense-in-depth designed and integrated into the end-to-end architecture
    - 802.11 fundamental and enhanced security features
    - General network security elements, plus any WLAN-specific features
- The goal being: consistent security policy enforcement across both the wired and wireless network
  - Critical to effective network security
  - Not a WLAN overlay

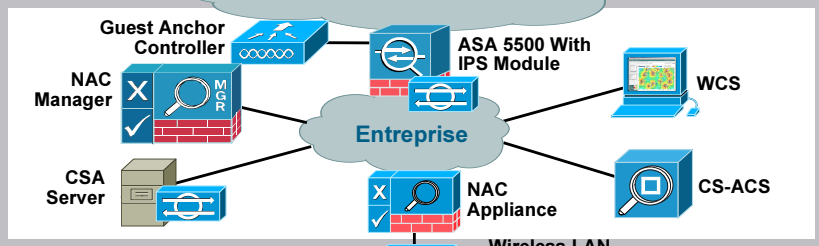


Architecture unifiée de sécurité filaire et sans-fils



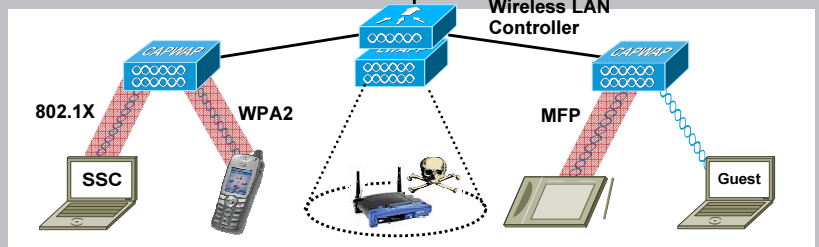
Protection du poste client

- Host intrusion prevention
- Endpoint malware mitigation



Contrôle de traffic et d'accès

- Dynamic, role-based network access and managed connectivity
- WLAN threat mitigation with IPS/IDS
- Device posture assessment



Fondamentaux de sécu sans-fils

- Strong user authentication
- Strong transport encryption
- RF monitoring
- Secure guest access

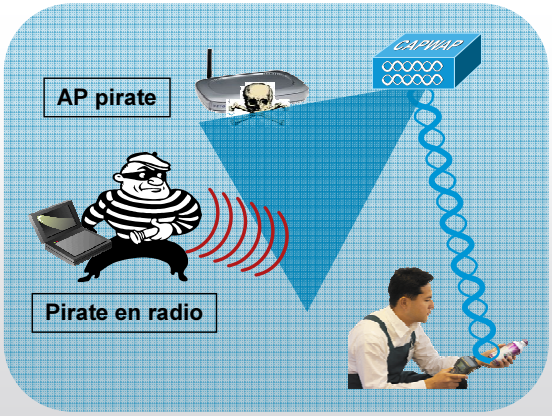
La puissance de l'intégration de la sécurité dans l'infrastructure

Les fonctionnalités IPS améliorées

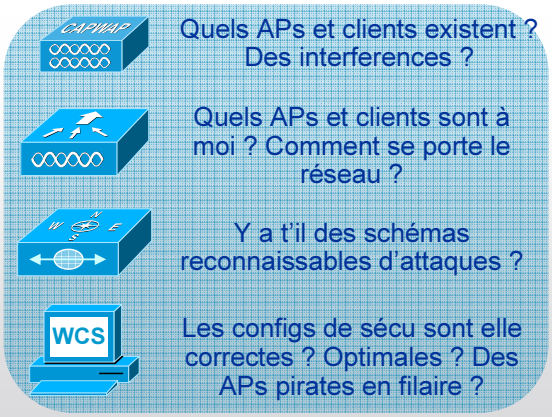
Signatures & Détection d'anomalie | Analyse de trafic réseau | Analyse d'inventaire | Analyse de configurations

Nous avons la visibilité complète sans-fil et filaire pour permettre une détection plus efficace et précise

Analysis des fréquences



Analyse de l'infrastructure



Rapports plus ACTIONS sur détection d'événements dans l'infrastructure

Agenda

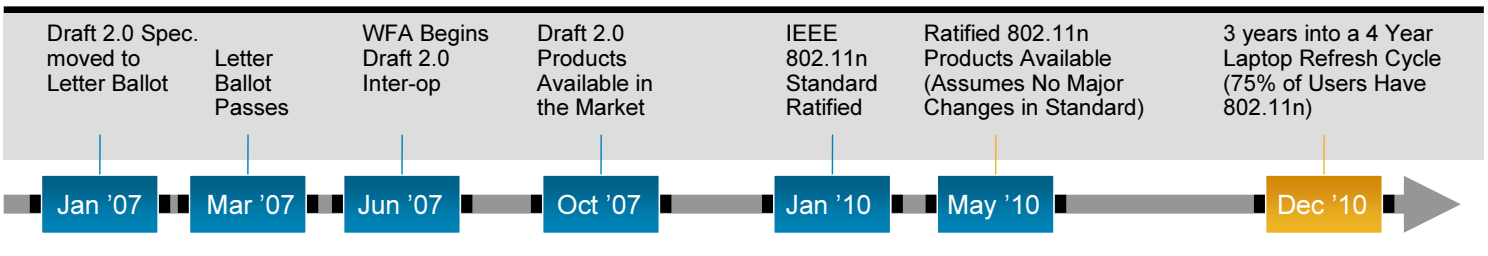
Pourquoi Cisco en WiFi?

Parlons de 802.11n et du nouveau point d'accès 1140 ABGN

Améliorer les performances des clients existants avec les technologies Cisco M-Drive et ClientLink

802.11n Standard Update

- **IEEE 802.11n standard is in final stages of development**
  - Major changes to the standard are unlikely (base features are stable, a few optional features are in flux) – Draft 9.0 today
  - Architectural and Security reviews completed
  - Letter Ballot passed in Mar '07 for draft 2.0
  - WFA certification of 802.11n Draft 2.0 products avail. since mid-2007
  - Expected official ratification date is January 2010 - pull-in in September 09?



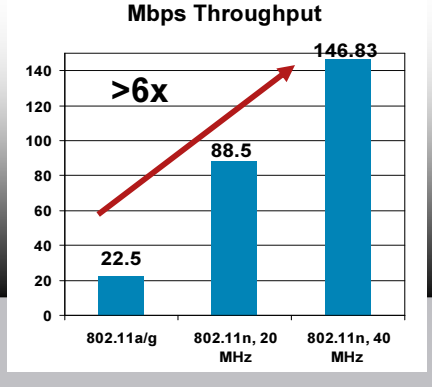
Les avantages de 802.11n

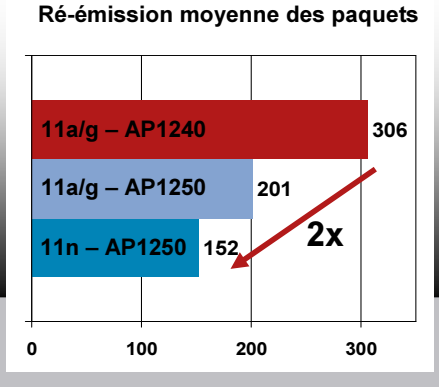
Rapide	Fiable	Prévisible
Increased Bandwidth for emerging and existing applications	Reduced Retries permitting low latency and delay sensitive applications such as voice	Reduced dead spots permitting consistent connectivity for every application

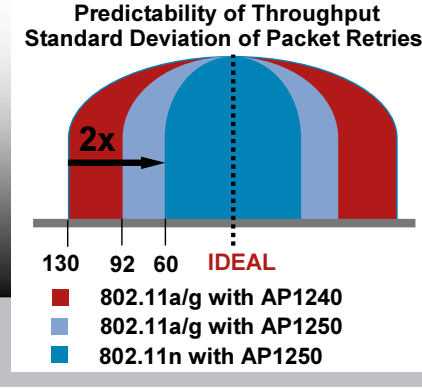
MIMO | 40Mhz Channels | Packet Aggregation | Backward Compatibility

802.11n = 6x Performance Increase
It's About a Whole Lot More Than Speed

Rapide	Fiable	Prévisible
6x more throughput	2x more reliable	2x more predictable
Enhanced file transfer and download speeds for large files	Lower latency for mobile unified communications	More consistent coverage and throughput for mobile applications



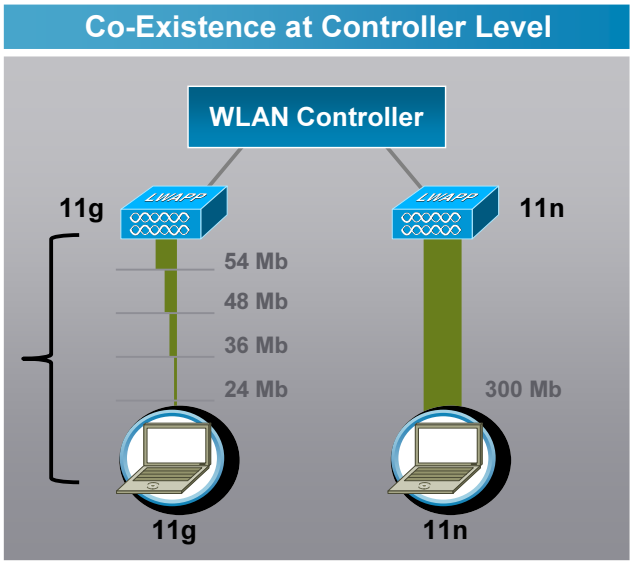


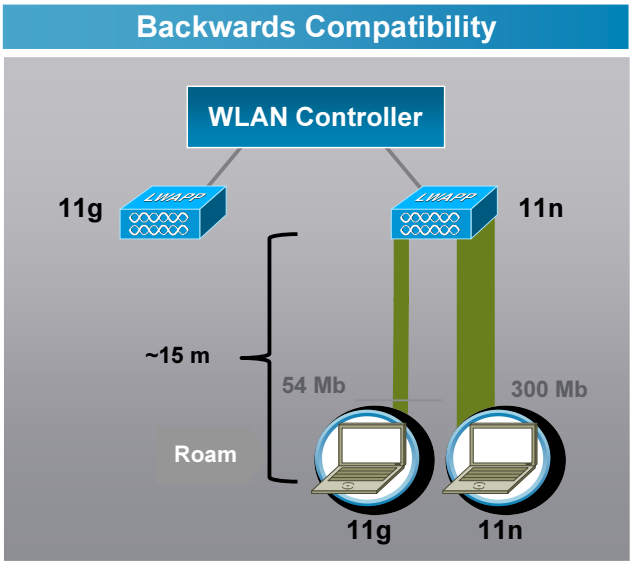


Compatibilité ascendante & Co-Existence

- Co-existence of ABG/N APs
- Benefits of 11n accrue to ABG clients

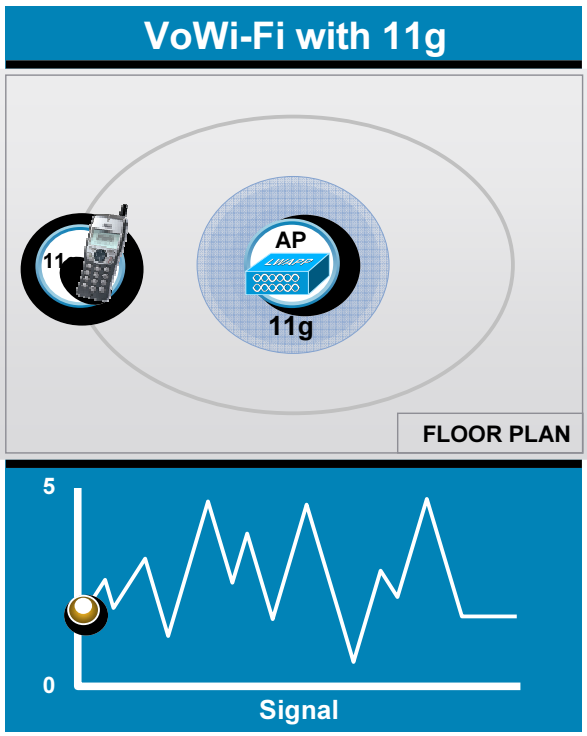
  MIMO benefits ABG clients on the AP receive side from MRC





Voice over 802.11n

802.11abg Performance Still Benefits from MIMO



Introducing the Aironet 1140 Series

- The Aironet AP-1140 is designed for carpeted areas.
  - Support for 5 GHz 802.11a/n and 2.4 GHz 802.11b/g/n radios
- Designed to run full 802.11n features using 802.3af power.
- Functionally similar to the AP1250 but with integrated antennas and lower profile.
- Cisco has sold over 350 000 access points using 802.11n technology

6X performance of A/G

Designed with a similar form as the AP-1130

The Aironet 1140 Series Access Point

- Integrated Radios with 6 integrated antennas
  - 2.4GHz (b/g/n)
  - 5GHz (a/n)
- 10/100/1000 Ethernet Port
- Console port
- Security lock
- Plastic over metal design
- Runs in Unified-mode (CAPWAP) only today, IOS coming
- Sleek design with only a discrete multifunction LED

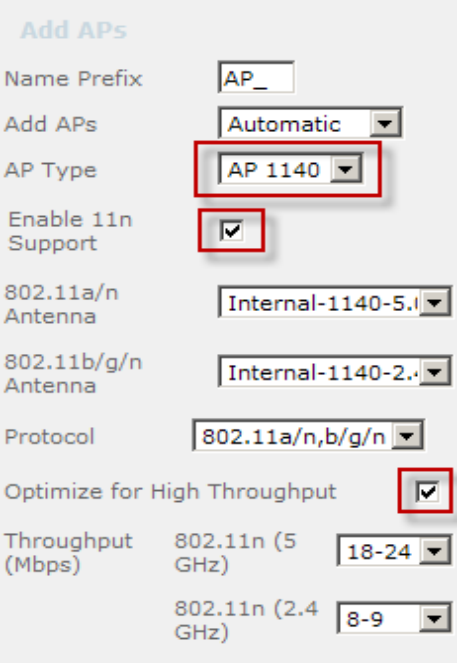
1140 vs 1250 Positioning

	1140	1250
	New! 	
Deployment	Indoor	Ruggedized / Durci
Antennas	Integrated	External (RP-TNC)
Wired Uplink	Gigabit	Gigabit
Power Options	PoE, AC, Pwr Injector	PoE*, ePoE, AC, Pwr Injector

• 1250 runs on PoE with reduced performance or only one radio, 1142 with full performance

WCS Planner

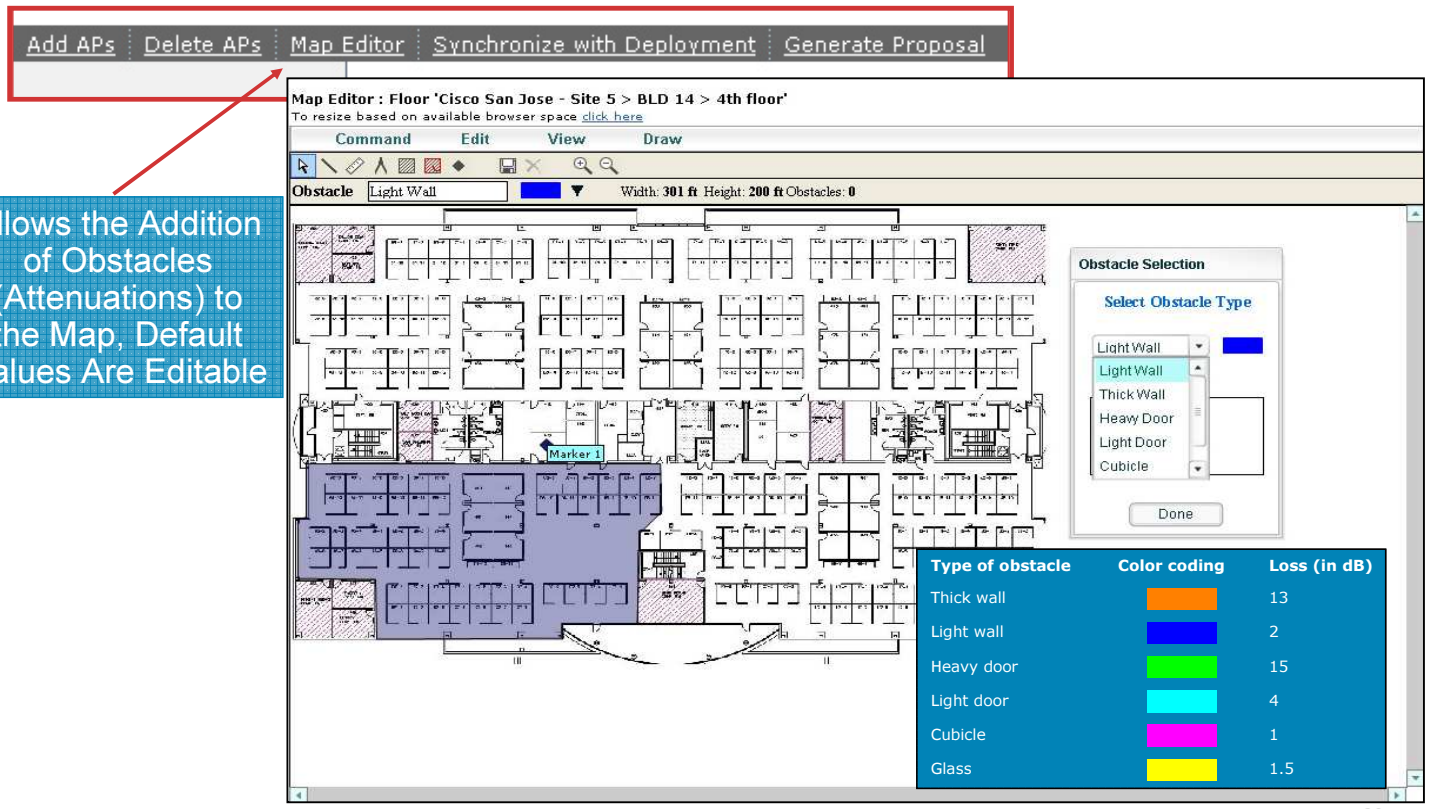
1140 and 11n Support



- Set AP type 1140
- Select ‘Enable 11n support’
- Select protocol ‘802.11a/n, b/g/n’
- Select optimize for HT
- Select Voice and location if desired
- Calculate/Apply/Add APs to Map

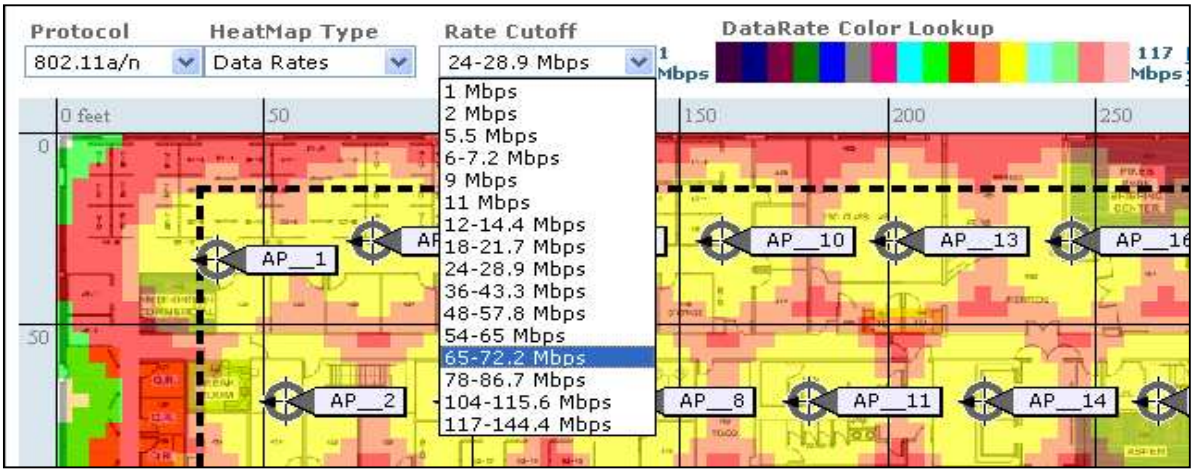
WCS Planner: Map Editor

Allows the Addition of Obstacles (Attenuations) to the Map, Default Values Are Editable



WCS Planner

Data Rate Heat Map



- Add APs to map
- Set Heat Map type to Data Rates
- Set Cutoff to desired minimum data rates

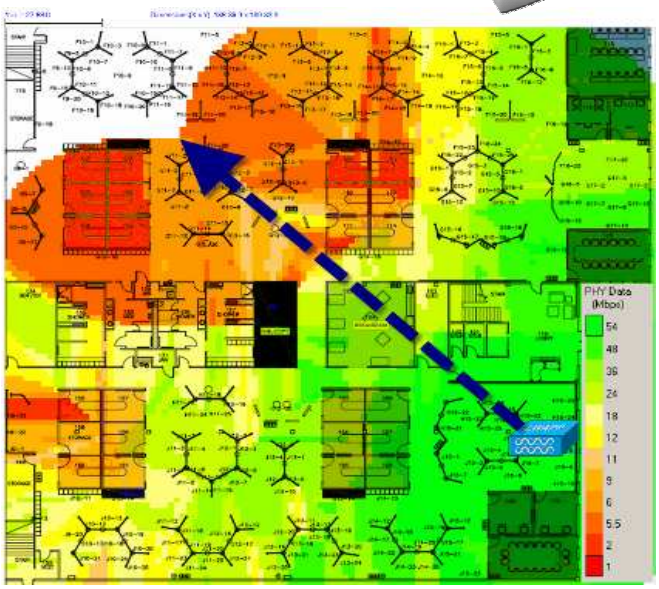
WCS Planner

Proposal

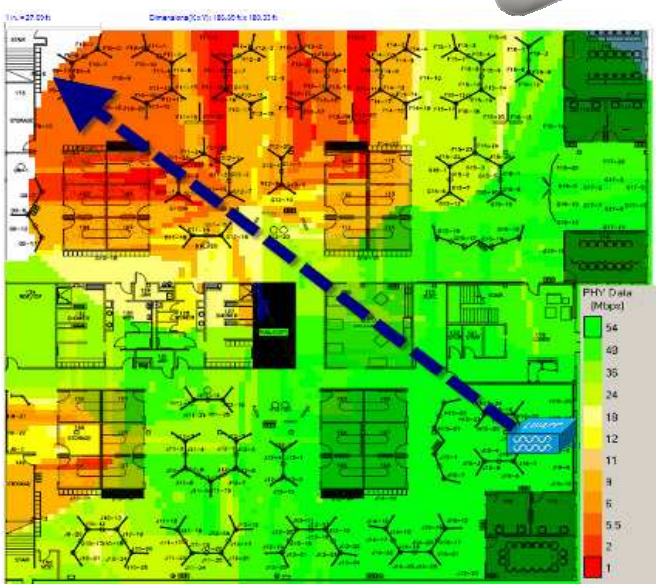
- Generate proposal
- Use proposal for budgetary estimates

2.4GHz - Maximum Range

AP1130 – 2.4GHz



AP1140 – 2.4GHz

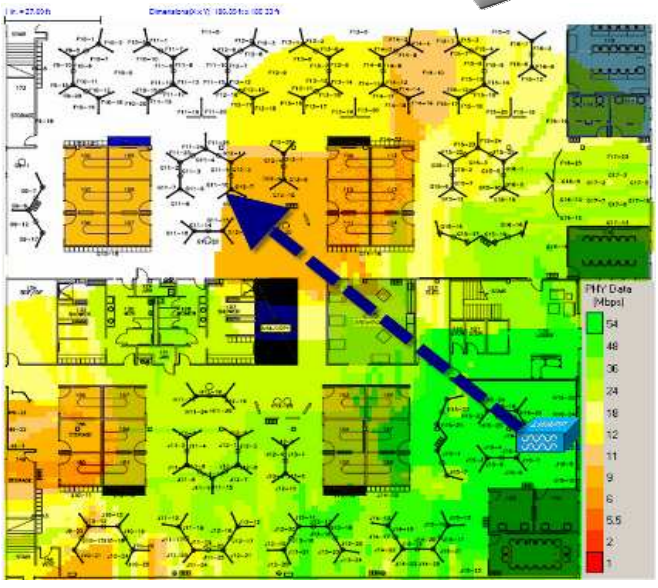


- Note the more uniform coverage of high (green) data rates

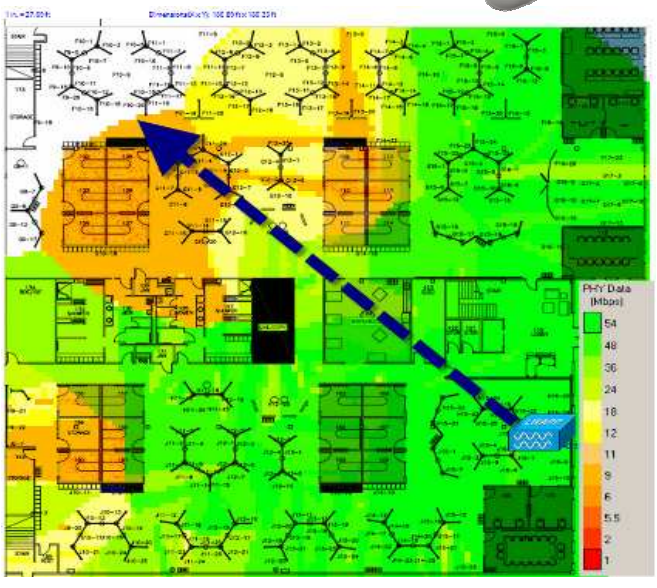
10% Increase in 802.11g Range

5GHz - Maximum Range

AP1130 – 5GHz



AP1140 – 5GHz

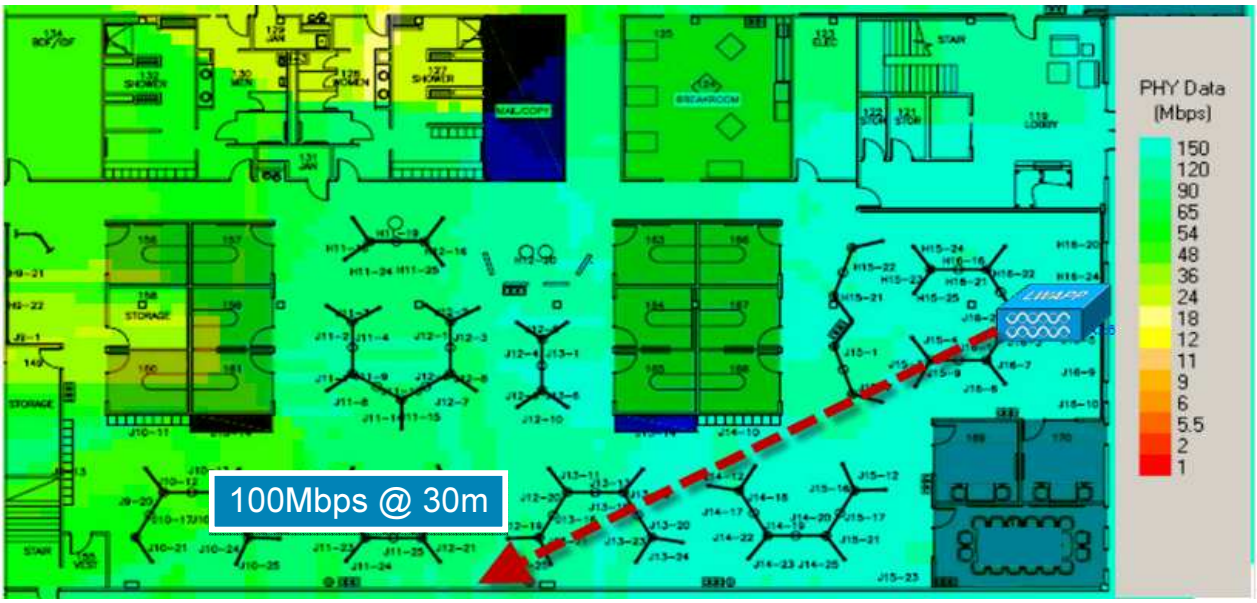


- Note the more uniform coverage of high (green) data rates

10-15% Increase in 802.11a Range

802.11n Coverage

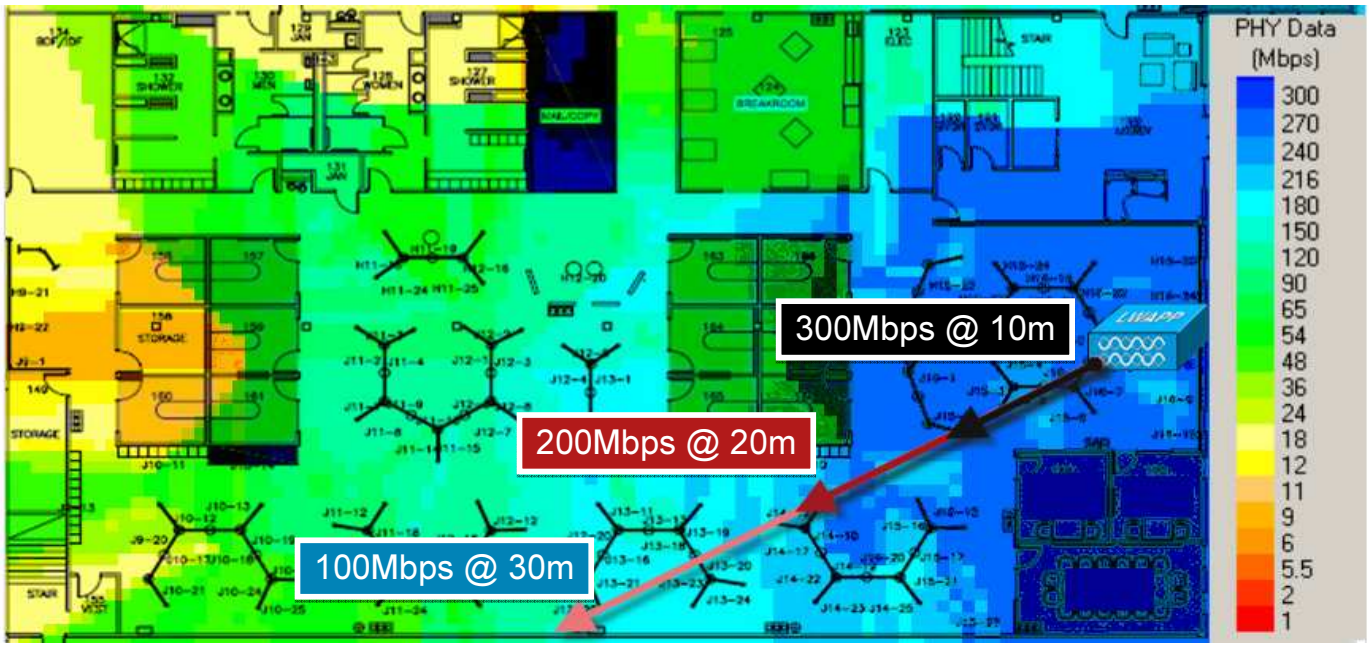
2.4GHz – 20MHz Channel Size



- Maximum of 144Mbps in a 2.4GHz 20MHz channel
- At 30m average data rate is 100Mbps

802.11n Coverage

5GHz – 40MHz Channel Size



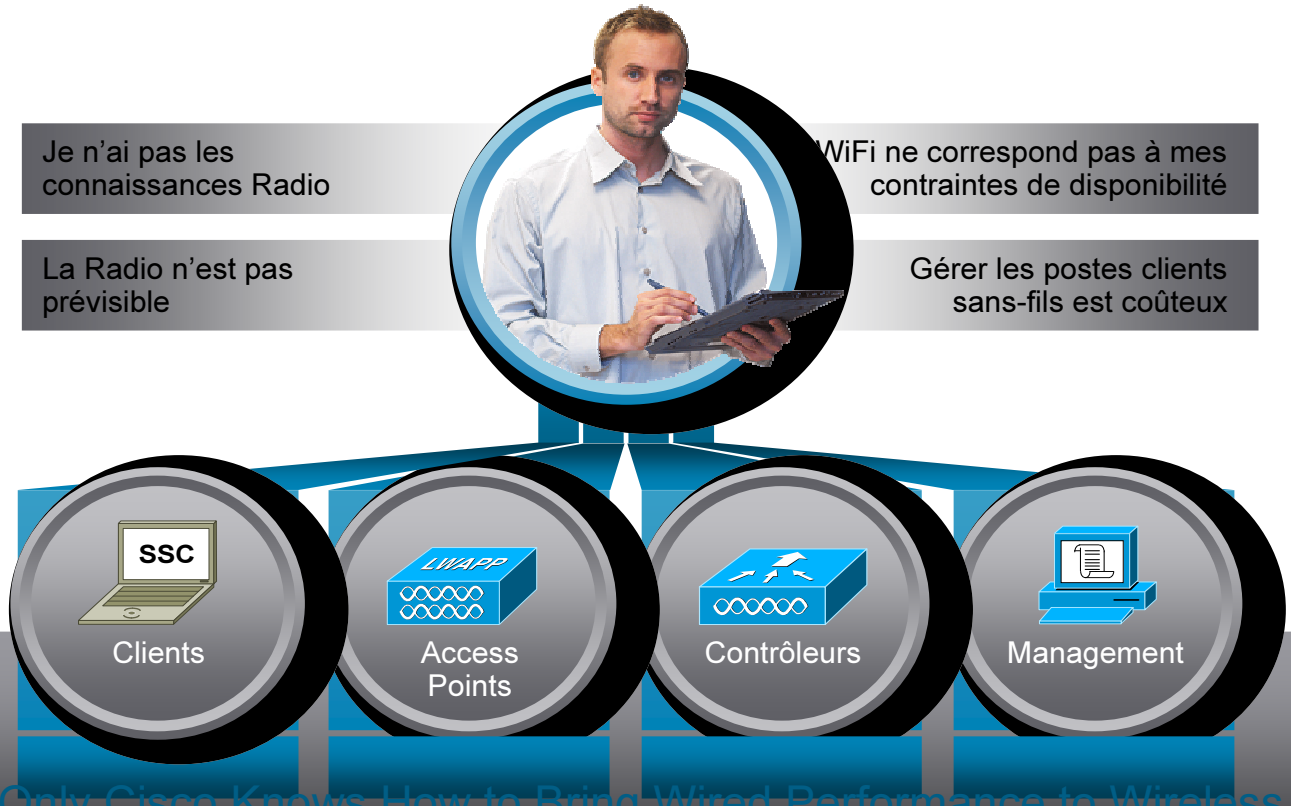
- Maximum of 300Mbps in a 5GHz 40MHz channel
- At 30m average data rate is 100Mbps

Cisco Expo 2009

Simplifying 802.11n Adoption with Cisco M-Drive Technology

Challenges for Wireless Deployment

Building a Business Class Network – Wired and Wireless



Cisco UWN with M-Drive Technology

RF Excellence

- Builds on Cisco RF Excellence to deliver a system wide approach that:
  - manages corporate RF spectrum
  - improves wireless coverage
  - increases system capacity and performance.

- Tools – Helps IT build and operate a WLAN without the need for extensive RF engineering skills.

Cisco UWN with M-Drive Technology

RF Excellence

- Automated wireless provisioning, self-healing (Radio Resource Mngt)
- Detect, classify, find, and correlate interference: Bluetooth, microwave ovens, and cordless phones
- Reduces coverage holes, increases network capacity & improves client performance

RRM

CleanAir Technology

ClientLink

DFS

Introducing Cisco M-Drive Technology

New!

Simplifying the Adoption of 802.11n through RF Excellence

System-wide Feature of the Cisco Unified Wireless Network

Capacité et Couverture

- Increased system-wide capacity with ClientLink
- Consistent network transmit and receive for optimized rate vs range
- Full scalability through optimal 5GHz spectrum use

Optimisation des connexions Clients

- Improved performance for existing 11a/g devices via ClientLink
- Automated client load balancing
- Extensive client compatibility and predictable roaming

Simplification du management du WiFi

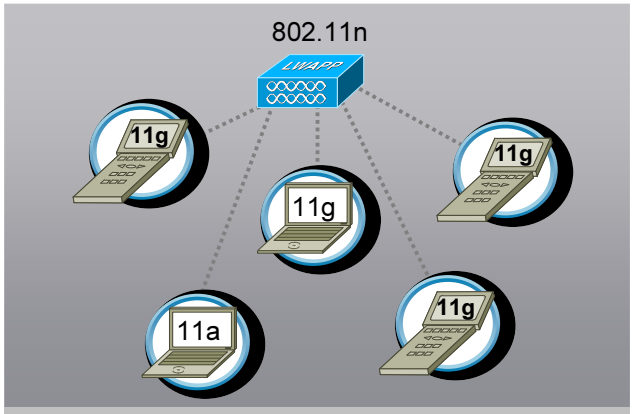
- Dynamic channel and power setting for 802.11n and 802.11abg
- Automated coverage hole detection and removal

Cisco M-Drive avec ClientLink

New!

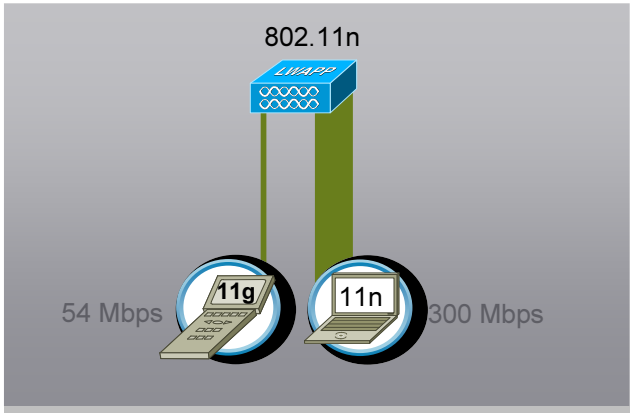
Protection de l'investissement dans les clients a/g

Proposal #1:
Extending Useful Life of 11a/g Devices



11a/g devices reaching max. performance but too costly to upgrade

Proposal #2:
True Fairness for Mixed Device Networks

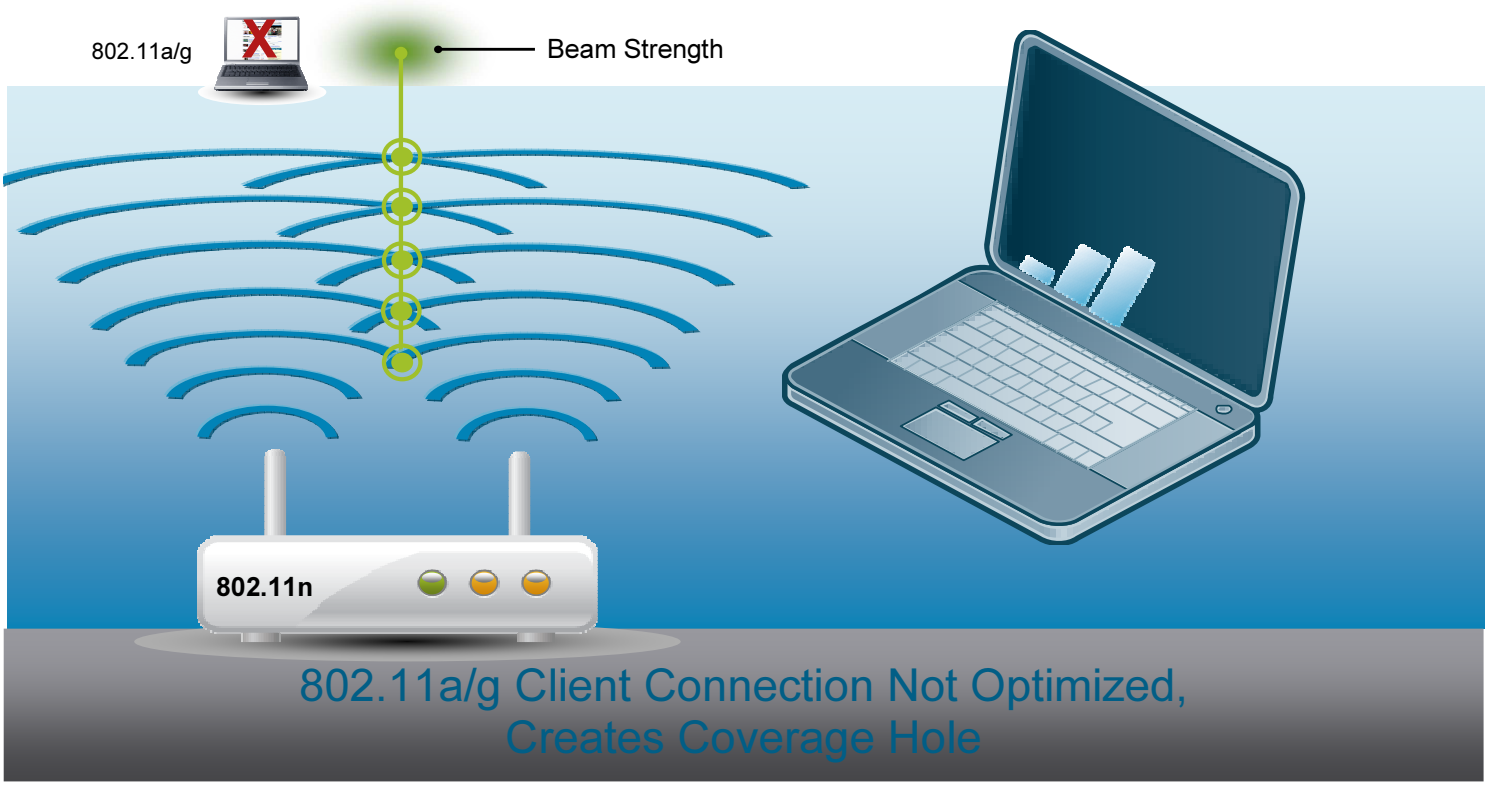


11a/g devices consume valuable "airtime", reducing the performance of 11n devices

- ClientLink delivers the following benefits:
  1. Provides consistently higher throughput per 11a/g device
  2. Increases overall system capacity for both 11a/g and 11n devices
  3. Reduces coverage holes in challenging RF environments

Existing 802.11n Solutions

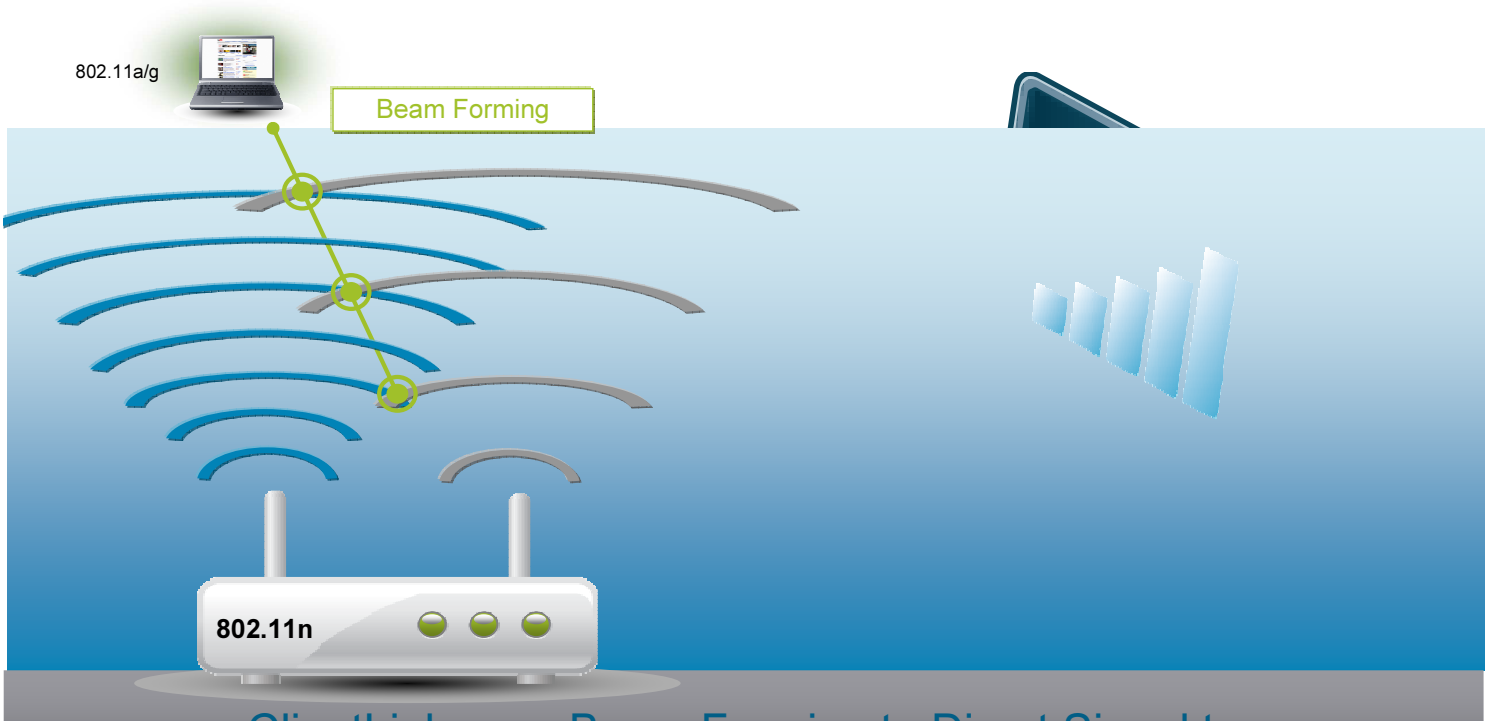
Beam Strength Not Directed to Client



802.11a/g Client Connection Not Optimized,
Creates Coverage Hole

Cisco M-Drive with ClientLink

Cisco Innovation: Beam Forming Intelligence



ClientLink uses Beam Forming to Direct Signal to
Improve Performance and Coverage for 802.11a/g Devices

Benefice #1: Améliore les débits

ClientLink Offers Higher Throughput per 11a/g Device

Miercom

Up to 65% Increase in Throughput

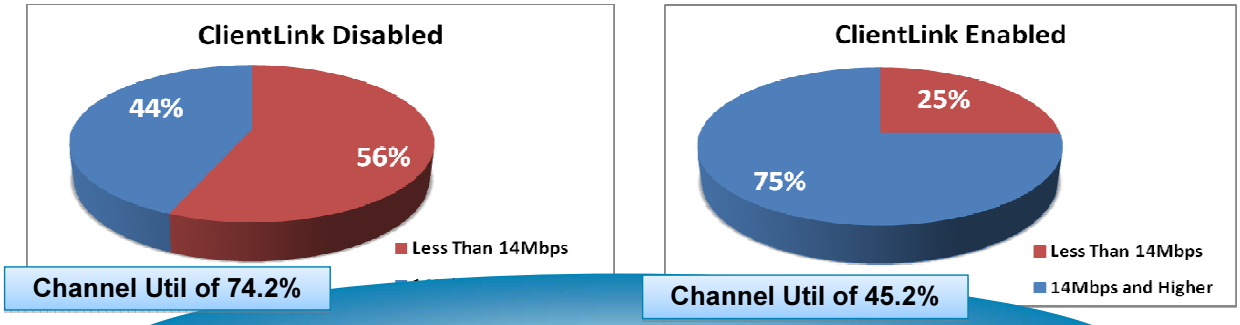
Test: 802.11a/g device with 802.11n network
Source: Miercom

Benefice #2: meilleure capacité système

Consistently Higher Throughput over Coverage Area

Miercom

Measuring throughput at 16 different locations



Up to 27% Improvement in Channel Capacity

- ClientLink allows clients to [illegible] higher data rates. Faster data transmission, less retries = overall more efficient use of RF channel.
- Faster 11a/g transactions opens airtime for 11n devices, allowing them to also experience a performance improvement

Test: 802.11a/g device measured at 16 antenna orientations w/ 802.11n network
Source: Miercom

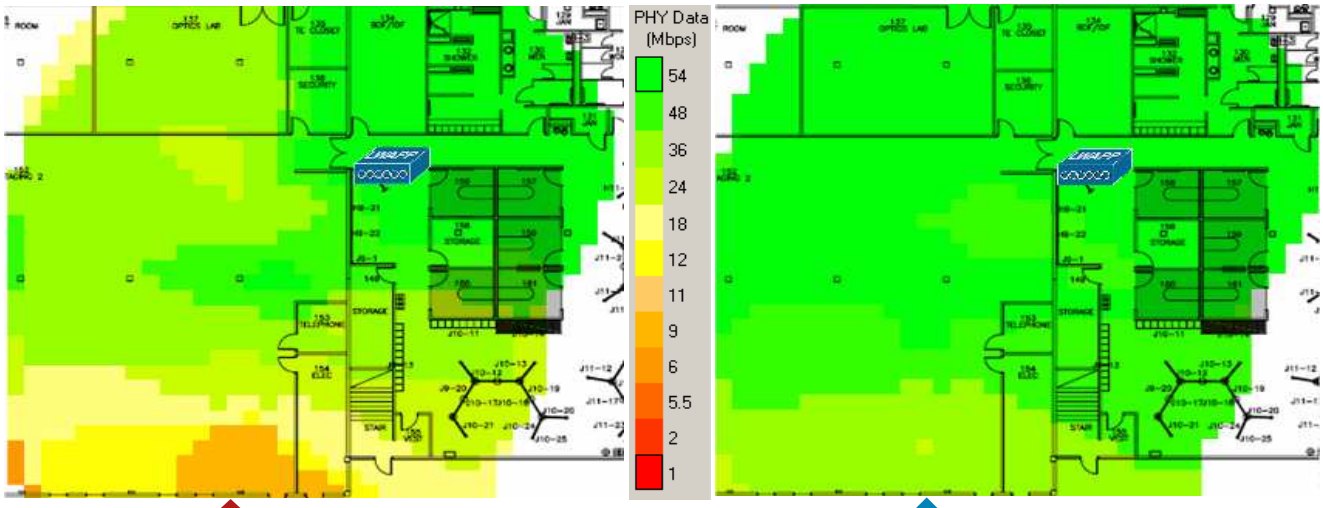
Benefice #3: réduction des trous de couverture

ClientLink = débits plus élevés

Miercom

ClientLink Disabled

ClientLink Enabled



Lower Data Rates

Higher Data Rates

Source: Miercom; AirMagnet 6.0 Iperf Survey

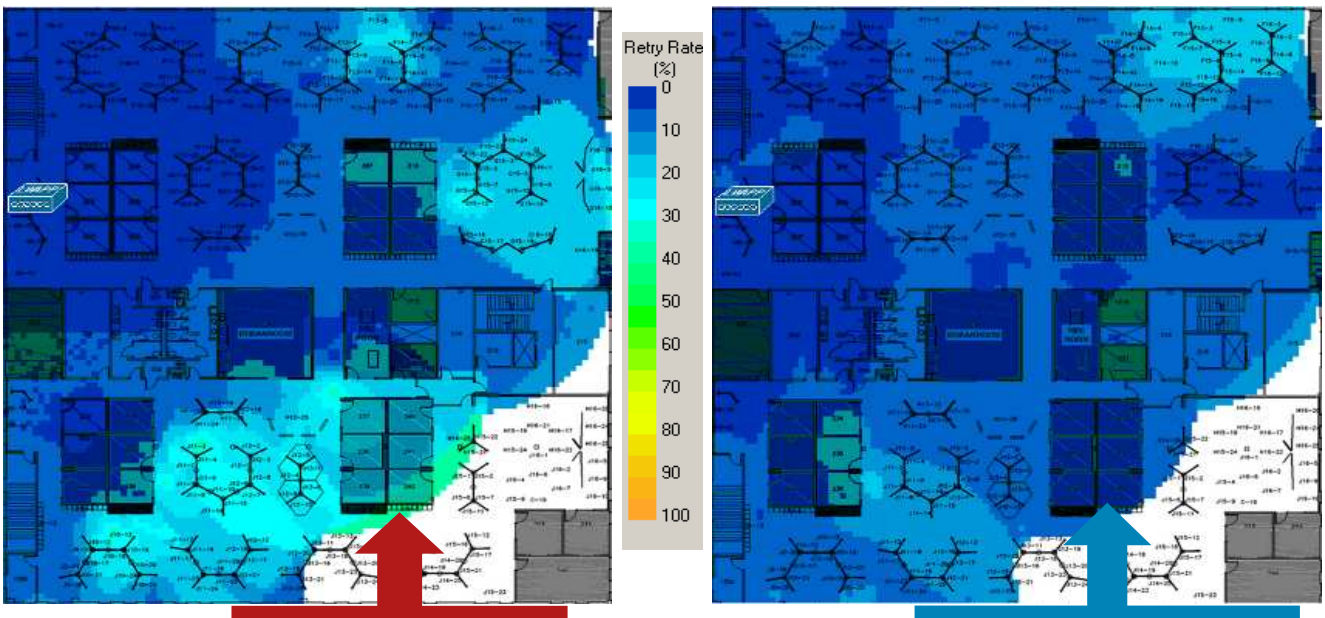
Benefice #3 (suite): réduit les trous de couv

Permet des taux de ré-émission plus faibles

Miercom

ClientLink Disabled

ClientLink Enabled



High Retry Rates

Low Retry Rates

Source: Miercom; AirMagnet 6.0 Iperf Survey

BandSelect

BandSelect

Access Point Assisted 5 GHz Band Selection

Challenge

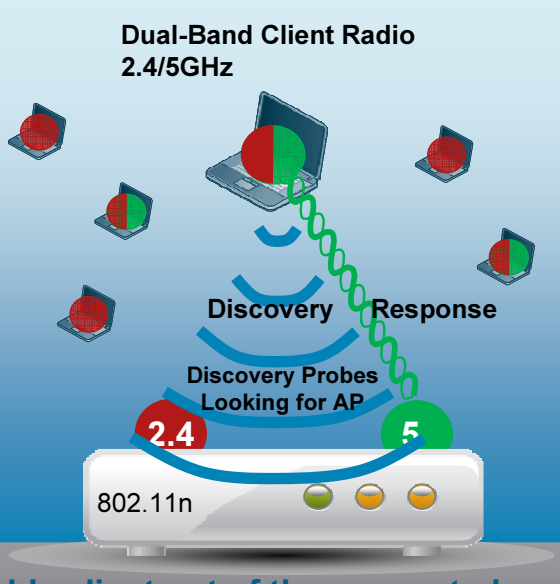
Dual-Band clients persistently connect to 2.4 GHz

- 2.4GHz may have 802.11b/g clients causing contention
- 2.4GHz is prone to interference

Solution

BandSelect directs clients to 5 GHz optimizing RF usage

- Better usage of the higher capacity 5GHz band
- Frees up 2.4 GHz for single band clients



Optimized RF utilization by moving 5 GHz capable client out of the congested 2.4 GHz channels

BandSelect
Algorithm

- Probe suppression
  - Identify dual band clients (2.4GHz and 5GHz capable)
    - Suppress immediate probe response on 2.4 GHz channels
    - Wait for dual band clients to scan into 5 GHz channels
  - Do not respond to dual-band capable client on 2.4 GHz
- Accommodate 2.4GHz clients and dual band clients that fall back to 2.4GHz
  - Time-out dual-band client 2.4GHz probe response suppression
  - Mark 2.4 GHz only clients and respond with probes

Questions?