

Wireless tech update 26 – 28 Januar 2012

Ib Hansen: ibhansen@cisco.com



Agenda

- Introduction
- Technology Overview
 - Hardware
 - Accesspoint
 - Controller
 - Software
 - Controller software 7.2
 - NCS 1.1
 - MSE
- Konkurent update
 - Hvad siger de / hvad af det passer ☺

Introduction





Technology overview












Hardware overview



Indoor AP Portfolio

Current models

Performance & Functionality

	11abg	11n		3 Spatial Streams	
Ruggedized	 AP1240	 AP1250	 AP1260	 AP3500e	 AP3600e
Carpeted	 AP1130	 AP1040	 AP1140	 AP3500i	 AP3600i
Home Office		 OEAP600			

Cisco Indoor .11n Access Point Positioning

Teleworker

Business-Ready
Wireless

Rich Media


Mission-Critical



OfficeExtend
AP 600



AP 1040



AP 3500
AP 1260
AP 1140



AP 3600

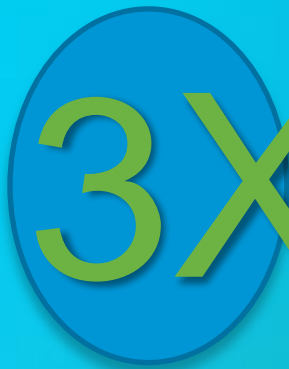


802.11n
WiFi

802.11n WiFi

AP 3600





SUSTAINED AVAILABILITY of 450Mbps Rates

Compared to 3 Spatial Stream 3x3 MIMO Access Points



Cisco Aironet 3600 Series Access
Points

4x4 ANTENNA DESIGN, 3 SPATIAL STREAMS

Redundant antenna design for more speed and reliability

CLIENTLINK 2.0 for 802.11n

Improves performance to all mobile devices: including
802.11a/g/n – 1SS, 2SS & 3SS

Enhanced CLEANAIR TECHNOLOGY

New , more powerful full-spectrum analysis while serving data
traffic

Products Description

AP-3600 Access Point products

Next generation flagship AP product

New Power over Ethernet (POE) 802.3at chipset*

Client Link 2.0 -- 4x4, 3SS, MIMO, beam forming, antenna system

4 Tx/Rx dual band radio design, (extra radio for performance)

Using 4x4:3 Architecture (Support up to 450 Mbps)

Support for newer 3-SS MCS rates 16-23

Compatible with existing mounting brackets and 802.3af PoE

AP3600 fully functions from 802.3af (15.4W) PoE

AP is capable of the newer 802.3at (higher power) negotiation if the option module happens to require additional power

AP-3600e and AP3600i



AP3600e – External antennas

AP-3600i – Internal antennas

Cisco Aironet 802.11n Access Point Feature Comparison Matrix

	3600 Series	3500 Series	1260 Series	1140 Series	1040 Series	600 Series	1550 Series
Data Rate	450 Mbps	300 Mbps	300 Mbps	300 Mbps	300 Mbps	300 Mbps	300 Mbps
Radio Design	4X4:3	2X3:2	2x3:2	2x3:2	2X2:2	2X2:2	2x3:2
CleanAir	☑	☑					☑
ClientLink	ClientLink 2.0	☑	☑	☑			☑
BandSelect	☑	☑	☑	☑	☑		
VideoStream	☑	☑	☑	☑	☑		
Rogue AP Detection	☑	☑	☑	☑	☑		☑
Adaptive wIPS	☑	☑	☑	☑	☑		
OfficeExtend						☑	
FlexConnect	☑	☑	☑	☑	☑	☑*	
Wireless Mesh	☑*	☑	☑	☑	☑		☑
Data Uplink (Mbps)	10/100/1000	10/100/1000	10/100/1000	10/100/1000	10/100/1000	10/100	10/100/1000
Power	802.3af	802.3af	802.3af	802.3af	802.3af	100 to 240 VAC, 50-60 Hz	By Model Number: See AP AAG
Temperature Range in Celsius	(i) -0 to 40° C (e) -20 to 55° C	(i) -0 to 40° C (e) -20 to 55° C	-20 to 55° C	-0 to 40° C	-0 to 40° C	0 to 40° C	-40 to 131° C
Wi-Fi Standards	802.11 a/b/g/n	802.11 a/b/g/n	802.11 a/b/g/n	802.11 a/b/g/n	802.11 a/b/g/n	802.11 a/b/g/n	802.11a/b/g/n

* Planned for 7.2 Release

AP-3600 Code Branch Support

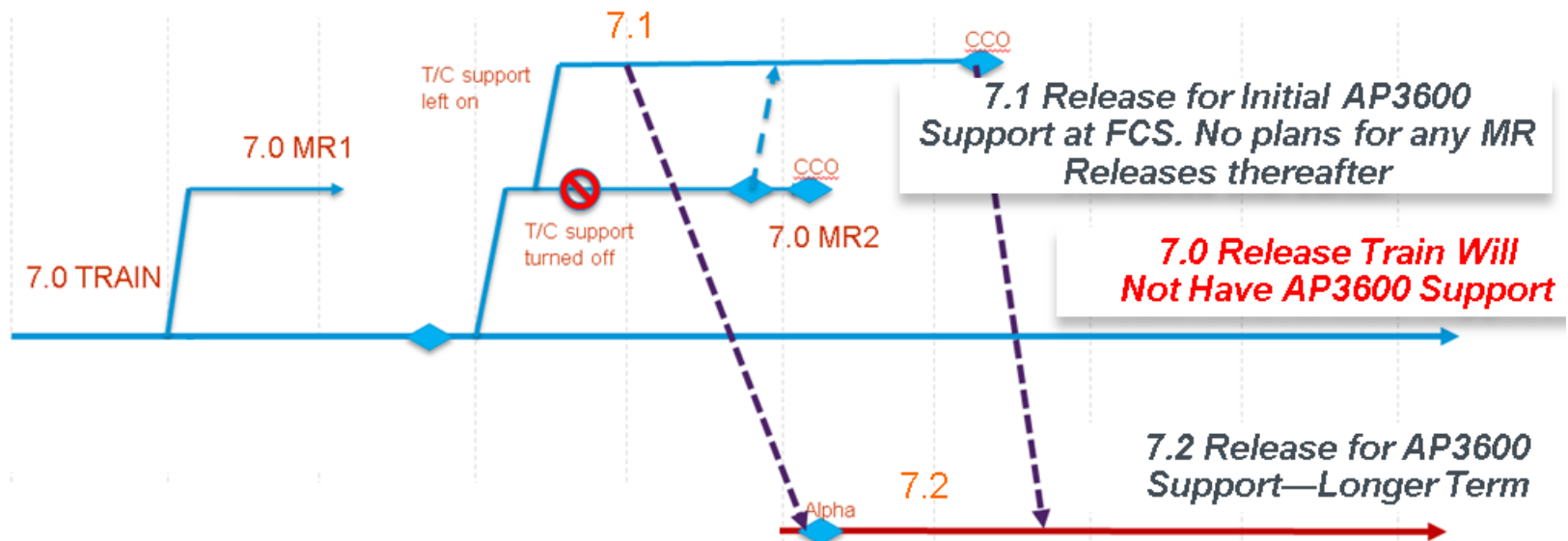
AP-3600 is initially supported in 7.1.91 (special release)

7.1.91 was introduced to add support for the AP3600

Any customers going to the 7.1 for the AP-3600 who require a WLC/AP fix ***MUST*** be ready to move to the 7.2 release which will support the AP3600 for the longer term

Also the AP-3600 is only supported on the following controllers 2500, 7500, 5508 and WiSM2

Supported with WCS 7.0.220 and higher and NCS 1.1 and



AP-3600 Functionality

AP-3600 – Key takeaways

The extra spatial stream with its additional MCS rates improve reliability and performance allowing faster throughput and more data rates choices to be able to shift to.

Support for extra spatial stream as well as Client Link 2.0 an 802.11n beam-forming method with the FOUR transceivers per band (one more than everyone else) **results in less retries and more predictable performance. Net result, it increases the overall data rates @ usable distances maintaining a better link at those top speeds**

New Macbook Pro and other devices are coming to market with three spatial streams so the faster throughput with the additional spatial stream is finally gaining meaningful traction in the enterprise.

MCS	Coding	Modulation	Streams	Signal BW = 20 MHz		40 MHz	
				GI = 800 nS	GI = 400 nS	GI = 800 nS	GI = 400 nS
MCS16	1/2	BPSK	3	19.5	21.7	40.5	45
MCS17	1/2	QPSK	3	39	43.3	81	90
MCS18	3/4	QPSK	3	58.5	65	121.5	135
MCS19	1/2	16-QAM	3	78	86.7	162	180
MCS20	3/4	16-QAM	3	117	130	243	270
MCS21	2/3	64-QAM	3	156	173.3	324	360
MCS22	3/4	64-QAM	3	175.5	195	364.5	405
MCS23	5/6	64-QAM	3	195	216.7	405	450

Three spatial streams permit MCS16-23 for up to 450 Mbps throughput

AP-3600i comparison to AP3500i



AP-3600i

AP-3500i

Almost identical in appearance – Note LED on AP-3600 is larger with rounded corners – AP-3500 has square LED

AP-3600e comparison to AP3500e



AP-3600e

AP-3500e

AP-3600 has four dual band antennas (8 transceivers -- 4 per band)

AP-3500 has six single band antennas (2 transceivers + 1 Rx per band)

AP-3600e antenna considerations



**AP-3600 RF
Connectors are
Orange A-D**

**Orange stripe
indicates
2.4 & 5 GHz
dual band antenna**



AP-3600e has RF connectors A-D marked “DUAL BAND” in ORANGE

AP-3600e antenna considerations








**Orange stripe
indicates
2.4 & 5 GHz
dual band antenna**



Do not use single band antennas unless you choose to use the AP-3600 as a single band device (disabling the other radio) otherwise use dual band antennas.

Dual Band Antennas for AP3600

Product ID	Description		Gain	List Price*	Orderability Date*
AIR-ANT2524DB-R AIR-ANT2524DB-R=	2.4 GHz 2 dBi/5 GHz 4 dBi Dipole Ant., Black, RP-TNC connectors		2 dBi (2.4 GHz) 4 dBi (5 GHz)	\$39	Orderable Now
AIR-ANT2524DG-R AIR-ANT2524DG-R=	2.4 GHz 2 dBi/5 GHz 4 dBi Dipole Ant., Gray, RP-TNC connectors		2 dBi (2.4 GHz) 4 dBi (5 GHz)	\$39	Orderable Now
AIR-ANT2524DW-R AIR-ANT2524DW-R=	2.4 GHz 2 dBi/5 GHz 4 dBi Dipole Ant., White, RP-TNC connectors		2 dBi (2.4 GHz) 4 dBi (5 GHz)	\$39	Orderable Now
AIR-ANT2566P4W-R=	2.4 GHz 6 dBi/5 GHz 6 dBi Directional Ant., 4-port, RP-TNC connectors		6 dBi (2.4 GHz) 6 dBi (5 GHz)	\$699	Orderable Now
AIR-ANT2524V4C-R=	2.4GHz 2 dBi/5GHz 4 dBi Ceiling Mount Omni Ant., 4-port, RP-TNC connectors		2 dBi (2.4 GHz) 4 dBi (5 GHz)	\$499	Orderable Now
AIR-ANT2546V4M-R=	2.4GHz 4 dBi/5GHz 6 dBi Wall Mount Omni Ant., 4-port, RP-TNC connectors		4 dBi (2.4 GHz) 6 dBi (5 GHz)	\$799	Q1 CY2012

**Subject to change until orderability date.*

Orderability date target shown with 90% confidence. FCS typically 1-2 weeks after orderability date.

AP-3600 comparison to AP3500

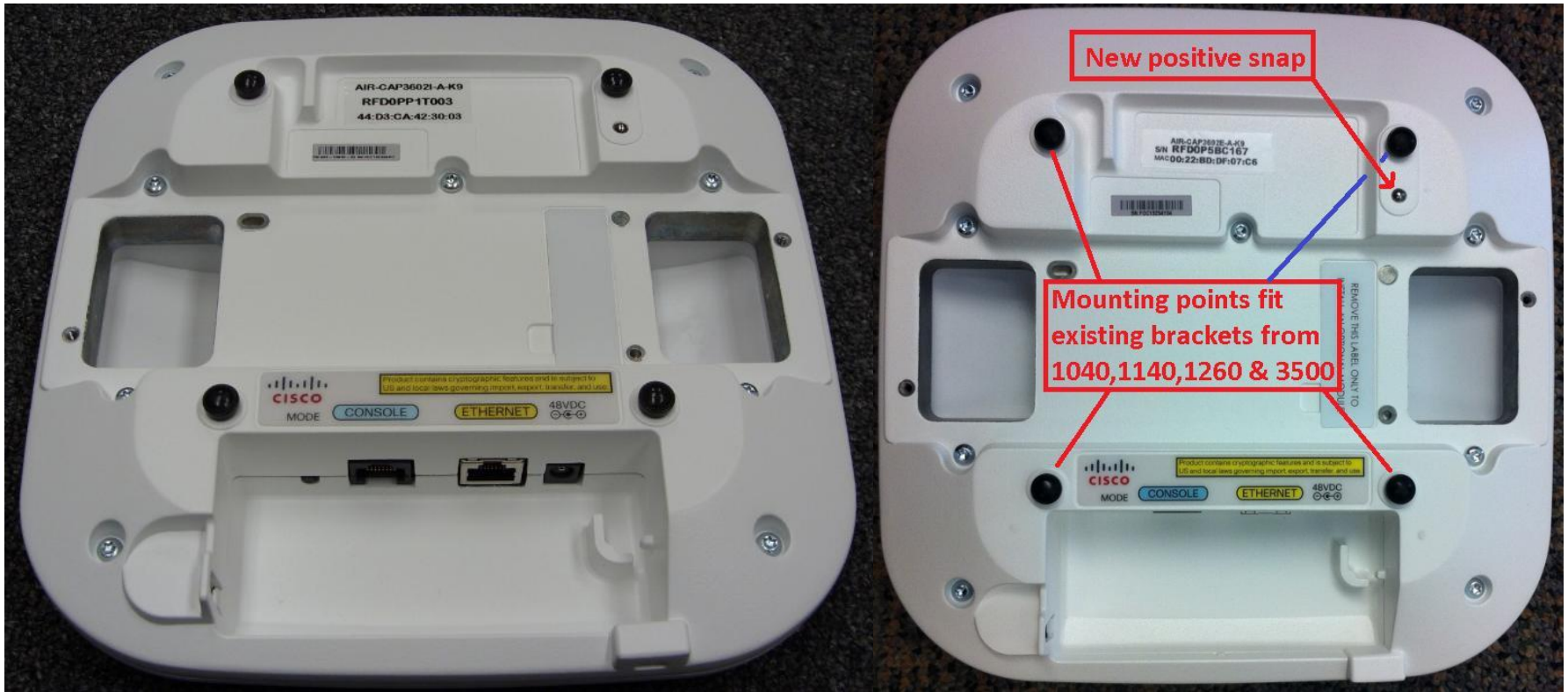


AP-3600 is slightly thicker in appearance –

This allows for more component and printed circuit board “real estate” so we can support additional circuitry for future growth

This AP housing allows for options going forward with regard to new features and hardware implementations

AP-3600 (bottom port) for future growth



Bottom designed for future growth / expandability

The module is a reality and is coming – We are putting module support into the code now currently determining things like LED colors - CLI/GUI options etc.

Note – Open holes allow module to place antennas in the radiating area 😊

All Cisco Access Points are well shielded

Robust with all cables inside shielded moisture resistant housing



Access Point inside view AP-3600

Cisco Access Points are well shielded and designed for areas where moisture is present.

This AP is designed to run without the need for venting

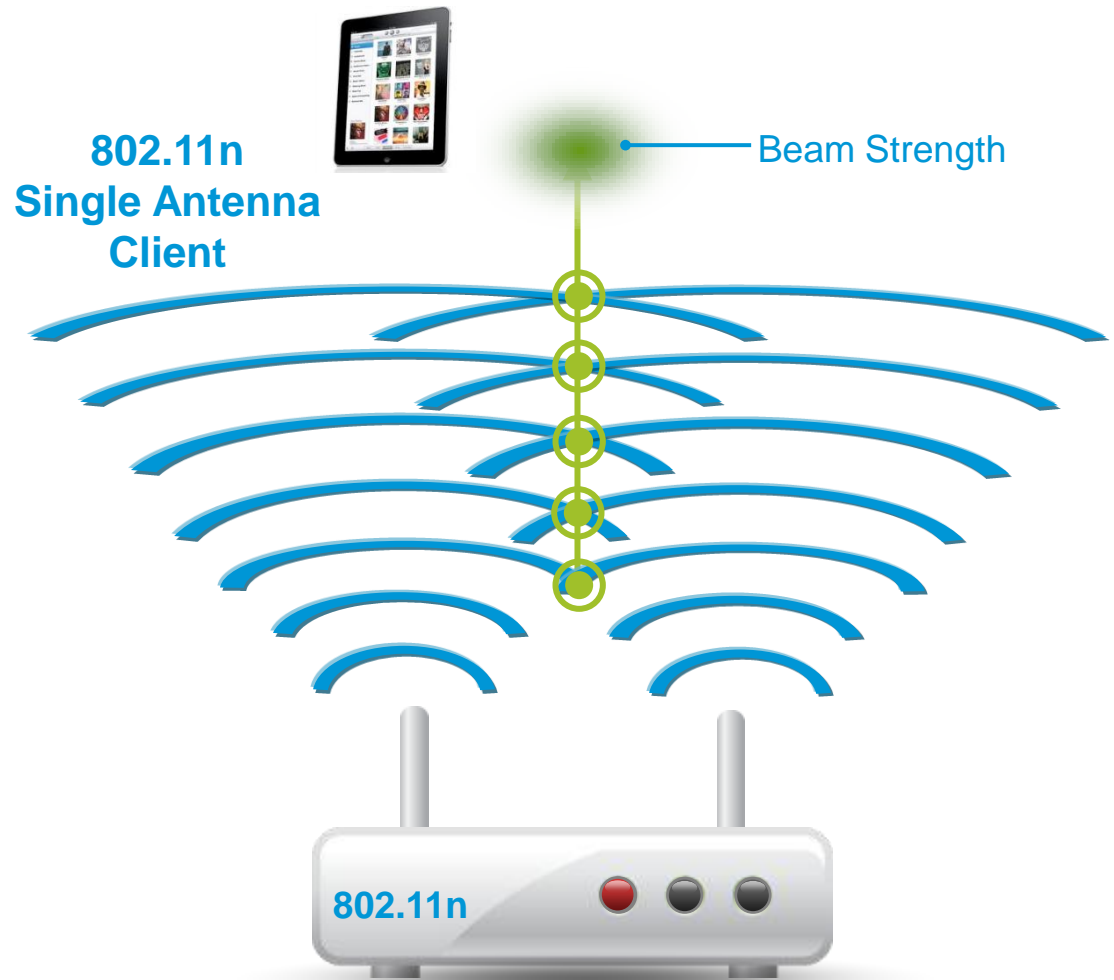
Cisco 3600 series Access Points are properly shielded and all components are able to handle the heat generated without open air “vent holes”

Note: Our antenna connections are not exposed to moisture and open air

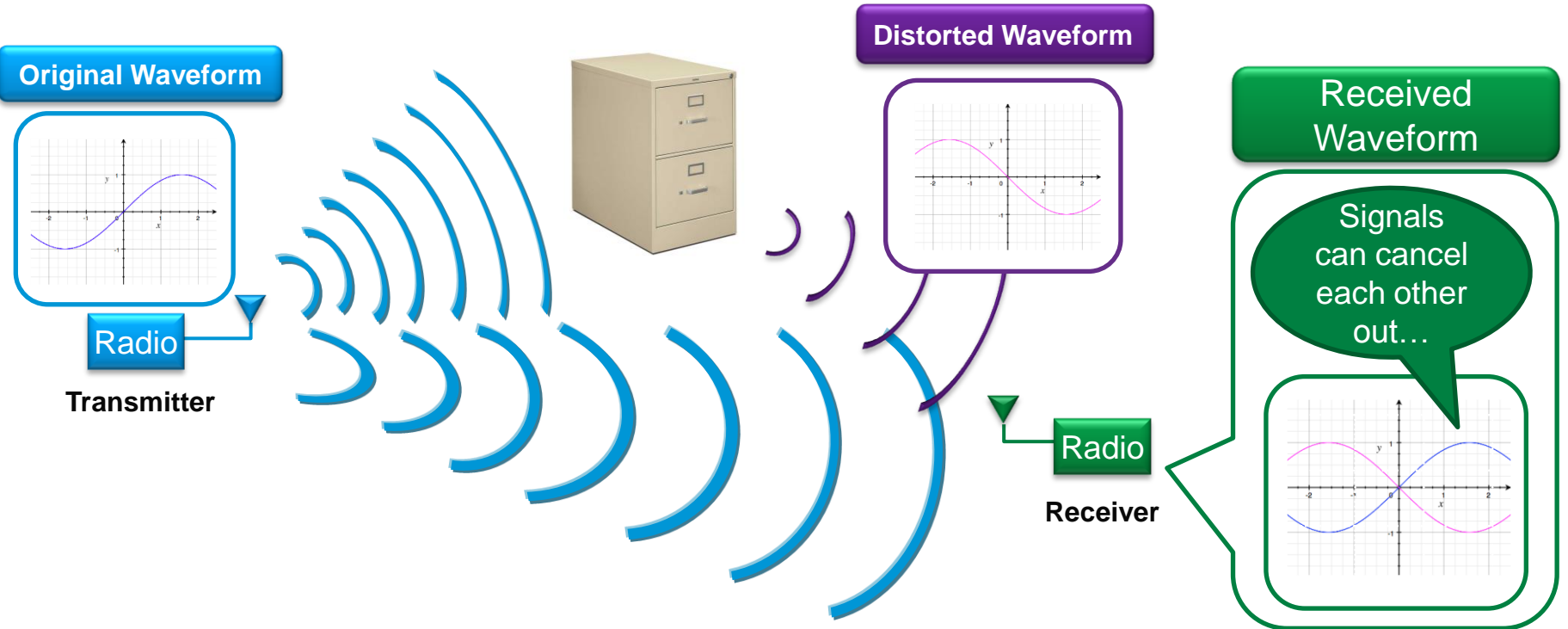
AP3600 and ClientLink 2.0

The Connectivity Challenge

- Clients can be in hard to reach areas with a low signal strength.
- Clients with a single antenna (like an iPad or Android) offer even more of a challenge since they lack diversity.
- 802.11n offers beam forming, but requires client support.



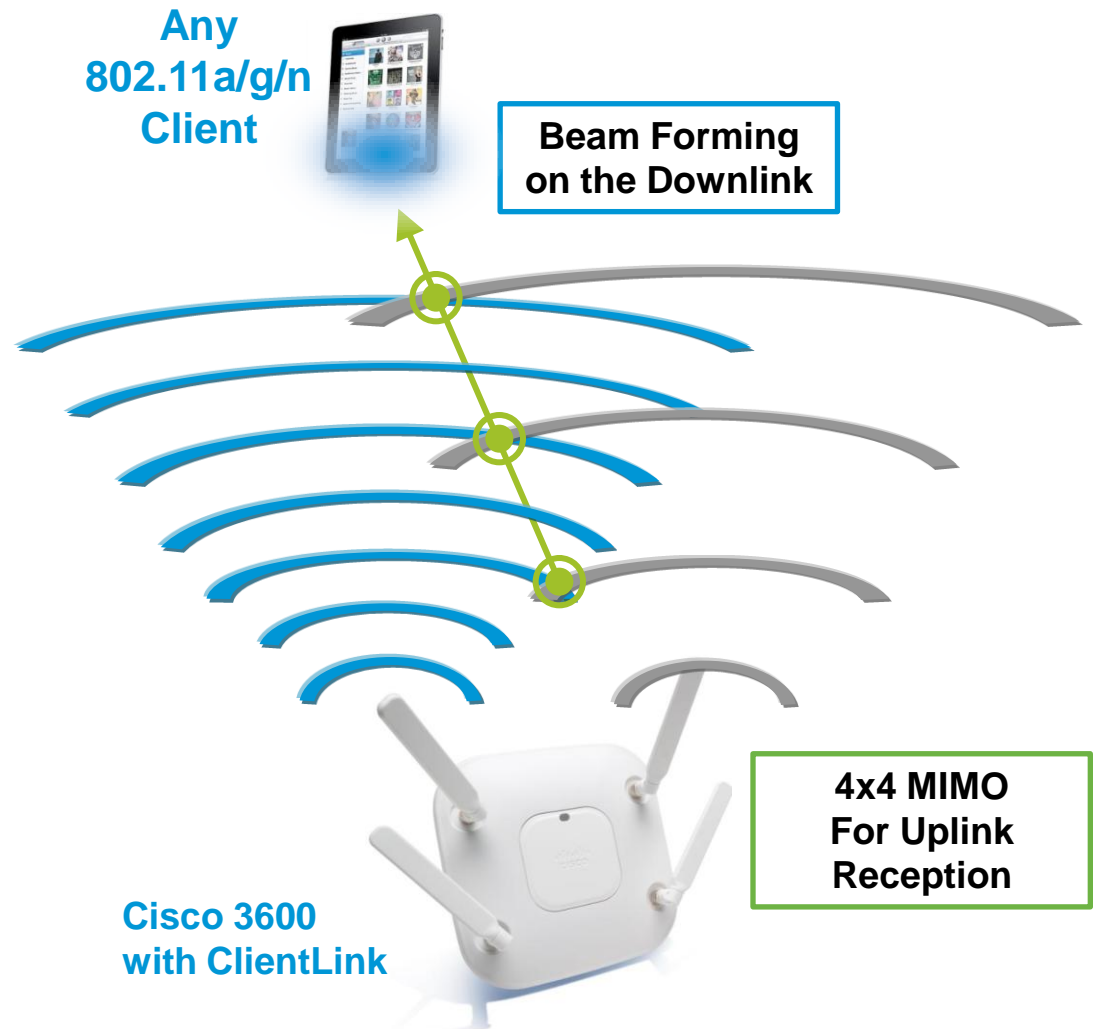
Multipath Can Lead to Distorted Waveforms and Reduced Data Rates



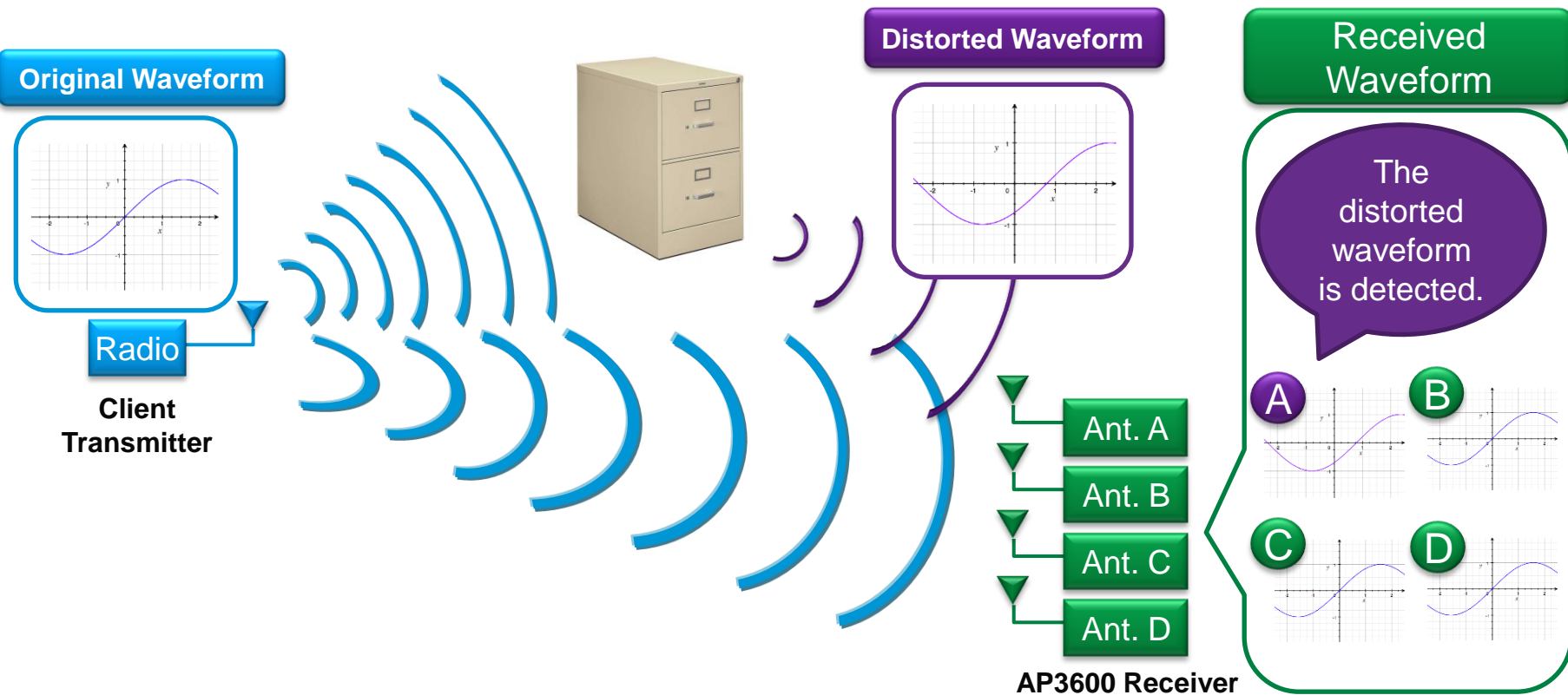
- Multipath from signal reflections can interfere with the original waveform's transmission causing it to be degraded.
- If the waveform is too degraded, the client cannot decode it and the transmitter must reduce the modulation complexity.

How Does Cisco Improve Connectivity?

- Cisco ClientLink uses four transmit antennas to increase the fidelity of the signal in the location of the client.
- Cisco ClientLink 2.0 can beam form to all 802.11a/g/n and 802.11n clients, whether the client is using 1, 2 or 3SSs, and requires no special client software.
- Four receivers enhances the upstream signal and updates the beam forming matrix.

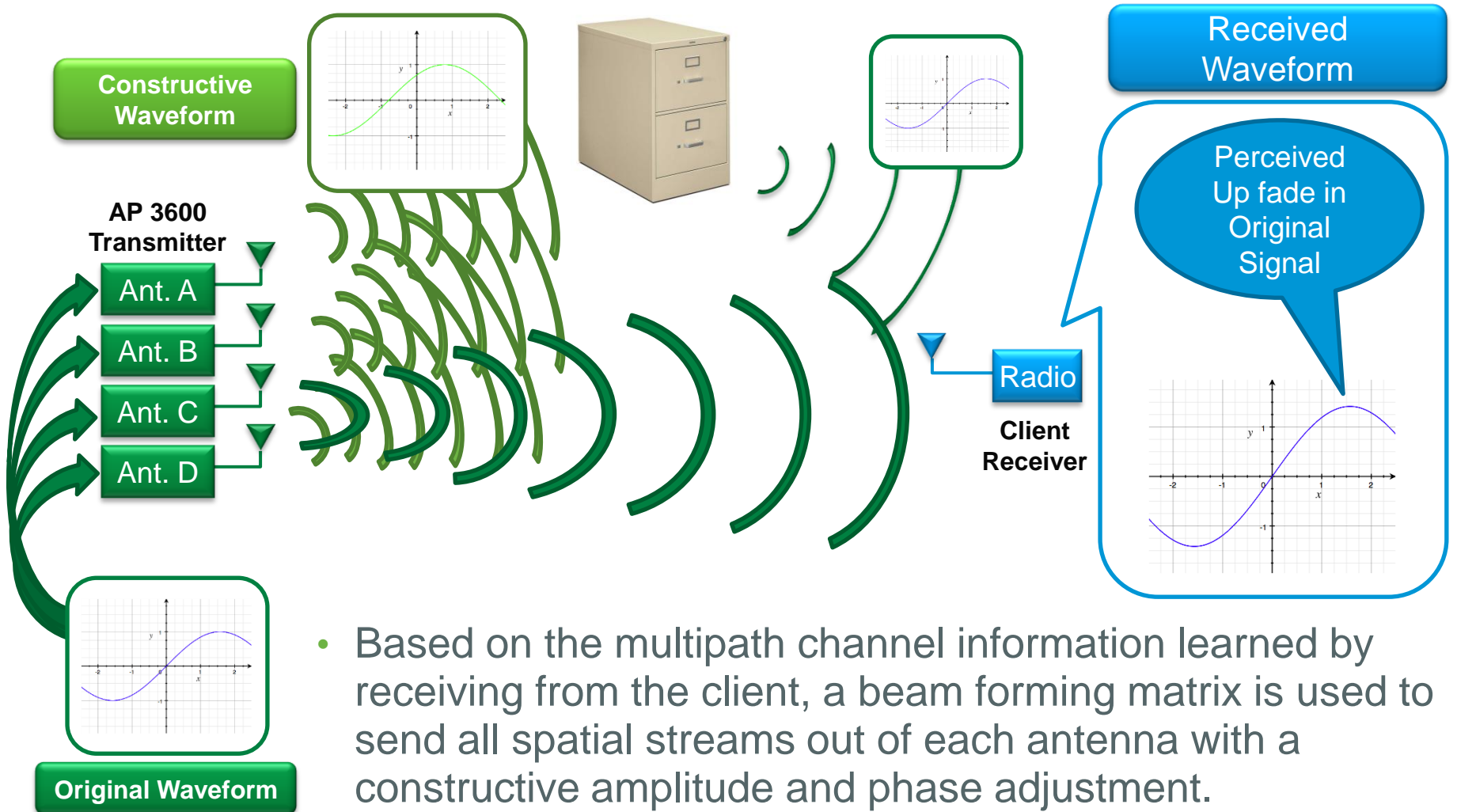


How The AP3600 Can Use Four Antennas To Hear Better

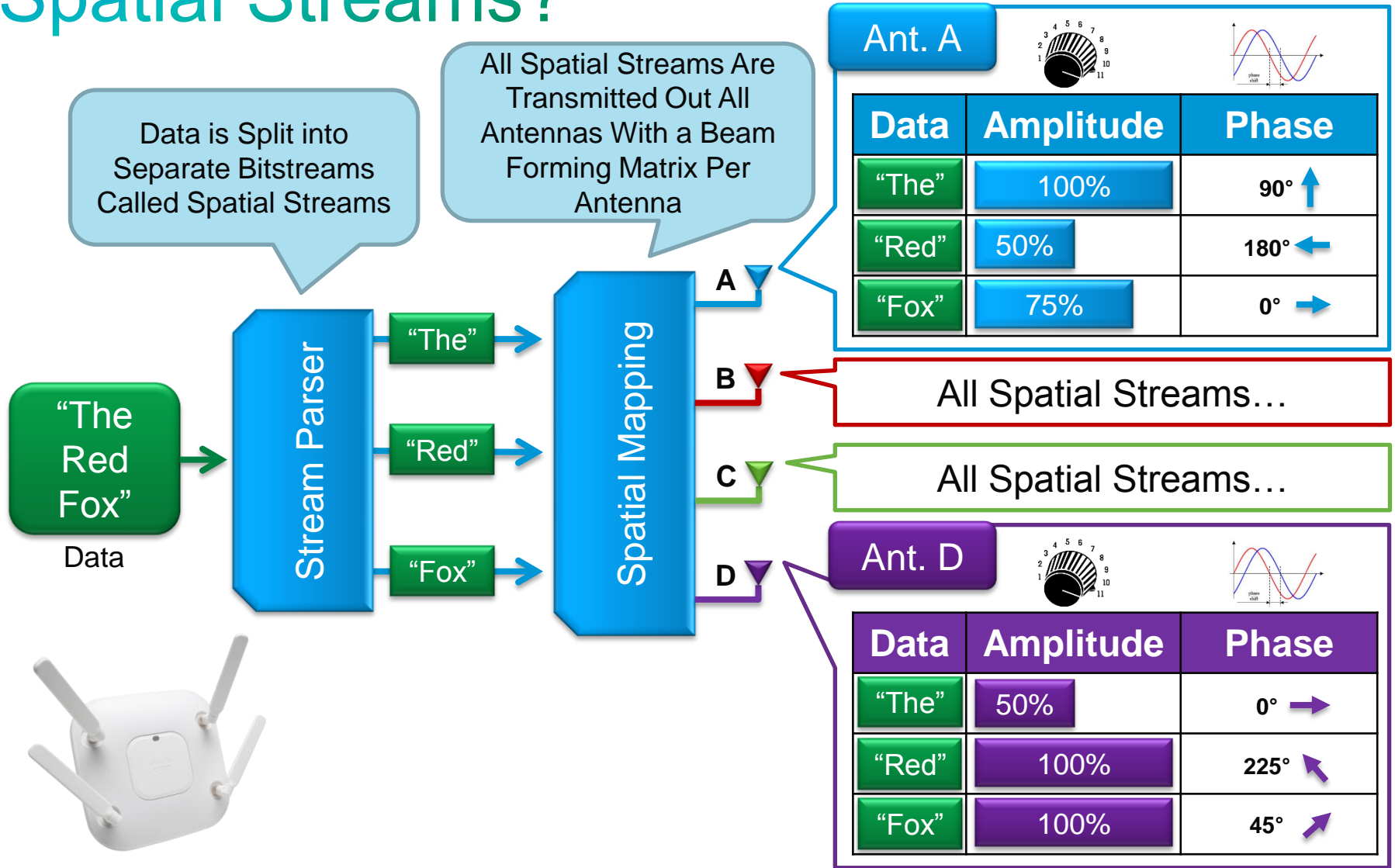


- More antennas means more view points into the RF environment.
- With more view points, the fidelity of the signal can be increased and information about the channel can be discovered for beam forming.

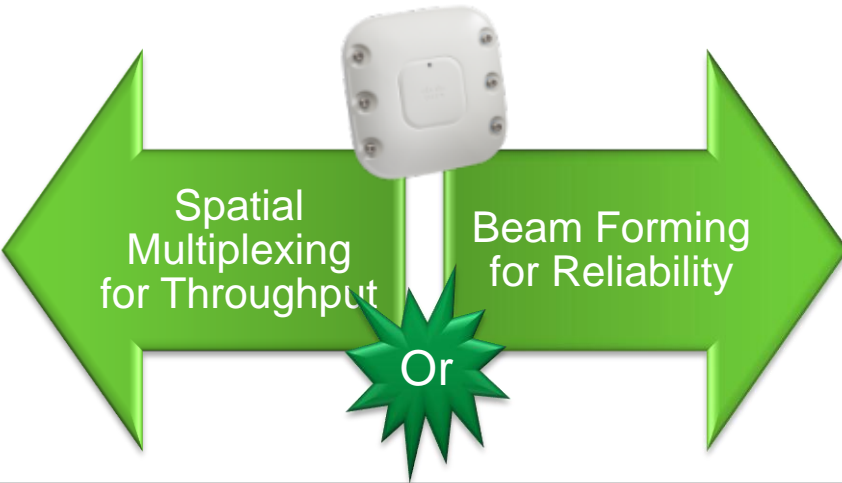
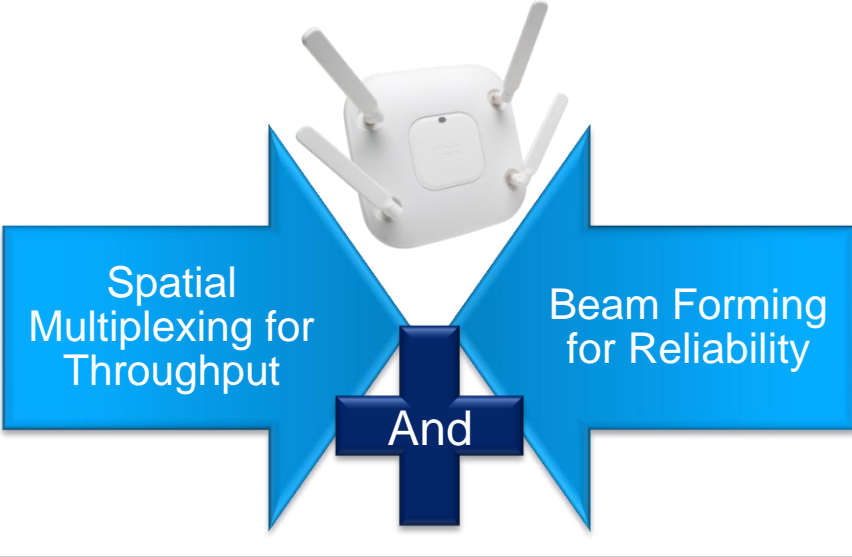
How The AP3600 Can Use Four Antennas To Beam Form



How Does the AP3600 Transmit Multiple Spatial Streams?



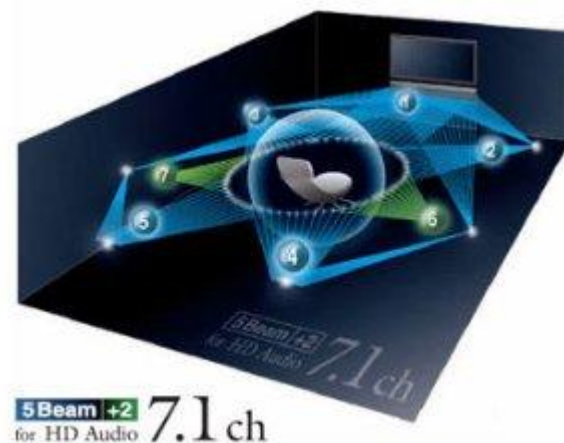
ClientLink 1.0 vs. 2.0 Comparison

ClientLink 1.0	ClientLink 2.0
	
<p>Beamforming to 15 clients per radio. (Still a maximum of 200 per radio).</p>	<p>Beamforming to 128 clients per radio. (Still a maximum of 200 per radio).</p>
<p>Beamforming to 11a/g Clients</p>	<p>Beamforming to 11a/g and 11n 1SS, 2SS and 3SS</p>
<p>2x3:2 MIMO Maximum of 300Mbps</p>	<p>4x4:3 MIMO Maximum of 450Mbps</p>

Beam Forming and Spatial Multiplexing Used In Other Applications



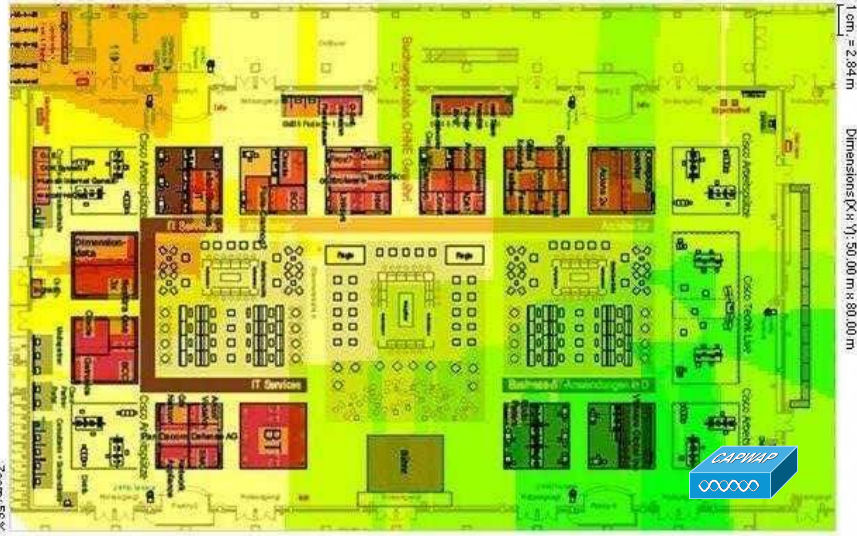
42 Speaker Array



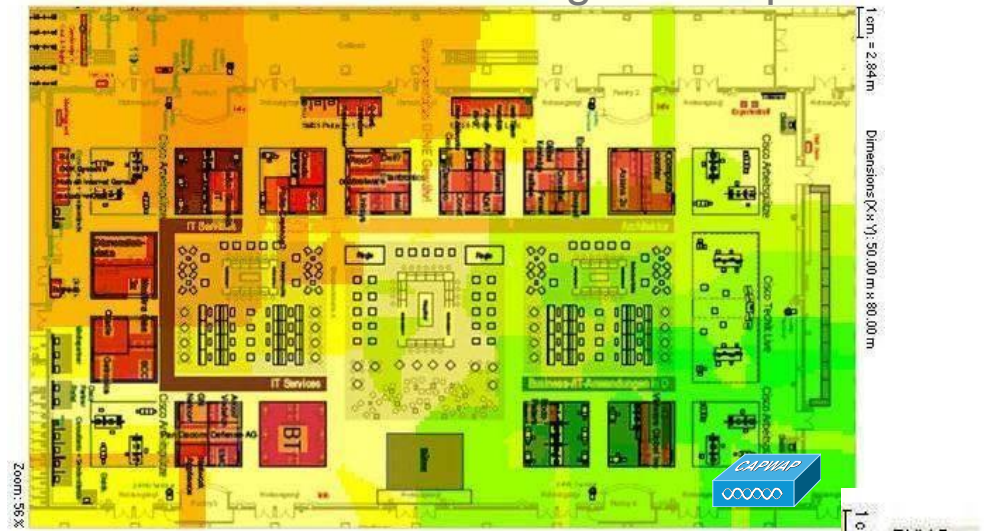
- This home audio system uses beam forming to recreate distinct audio channels from one location.
 - It can recreate a 7.1 channel system using 42 distinct speakers.
- The array is tuned initially with a microphone which optimizes the “sweet spot” where all audio channels can be heard with clarity.

Site Survey with Beamforming

Tool: AirMagnet 6.0 Iperf Survey

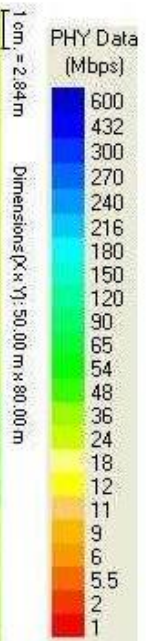


with Beamforming



w/o Beamforming

- ClientLink tested by **Miercom** Up to 27% more channel capacity
full report: <http://www.miercom.com/dl.html?fid=20090812&type=report>
- Clients: higher Datarate → faster transmission, less retries = better usage of the ressource air
- faster 11a/g transmission give 11n devices more “Airtime”



Video



The **NEW!** Cisco OfficeExtend 600 Access Point:

The industries only AP purposely designed for the teleworker



Full 802.11n Speed

Industry leading wireless performance and reliability

Simultaneous 2.4GHz & 5GHz Support

Avoid interference caused by residential devices

Zero-touch Deployment

Minimize turn-up time regardless of user skill set

Aironet 600 Series OfficeExtend AP

- Dual band 802.11n AP for the homes
- Validated OEAP Features / Function
- Simple and automatic provisioning
- 4 port switch. One dedicated port for corporate devices
- User-configured personal SSID
- RF channel / power are set automatically at power up
- Supported by 5508, WiSM2, 2500
- 7.67" x 6.92" x 1.45"



Powerful 802.11n Dual-band Performance

OfficeExtend 600 Series Access Points

- **Features & Specs**

- Supports secure corporate connectivity to the home

- Full 802.11n Speed

- Simultaneous Dualband 2.4GHz and 5GHz RF support

- Home traffic segmentation

- Multiple Controller-based deployment options

- Back-ward compatible with 802.11a/b/g clients

- Sleek design ideal for desktop placement

- **Promotions/Incentives**

- Standard CTMP incentive for competitor-to-Cisco migration planned

- **Competitive Differentiation**

- 802.11n performance and reliability

- Avoid common 2.4GHz interference caused by residential devices

- Limited Lifetime Warranty

- Support corporate devices and home devices with a single remote access device

- Centralized control and management

- Low TCO and investment protection supporting today's and tomorrow's client devices

- **Recognizing Opportunities**

- Organizations that require high-performance access for several teleworking employees

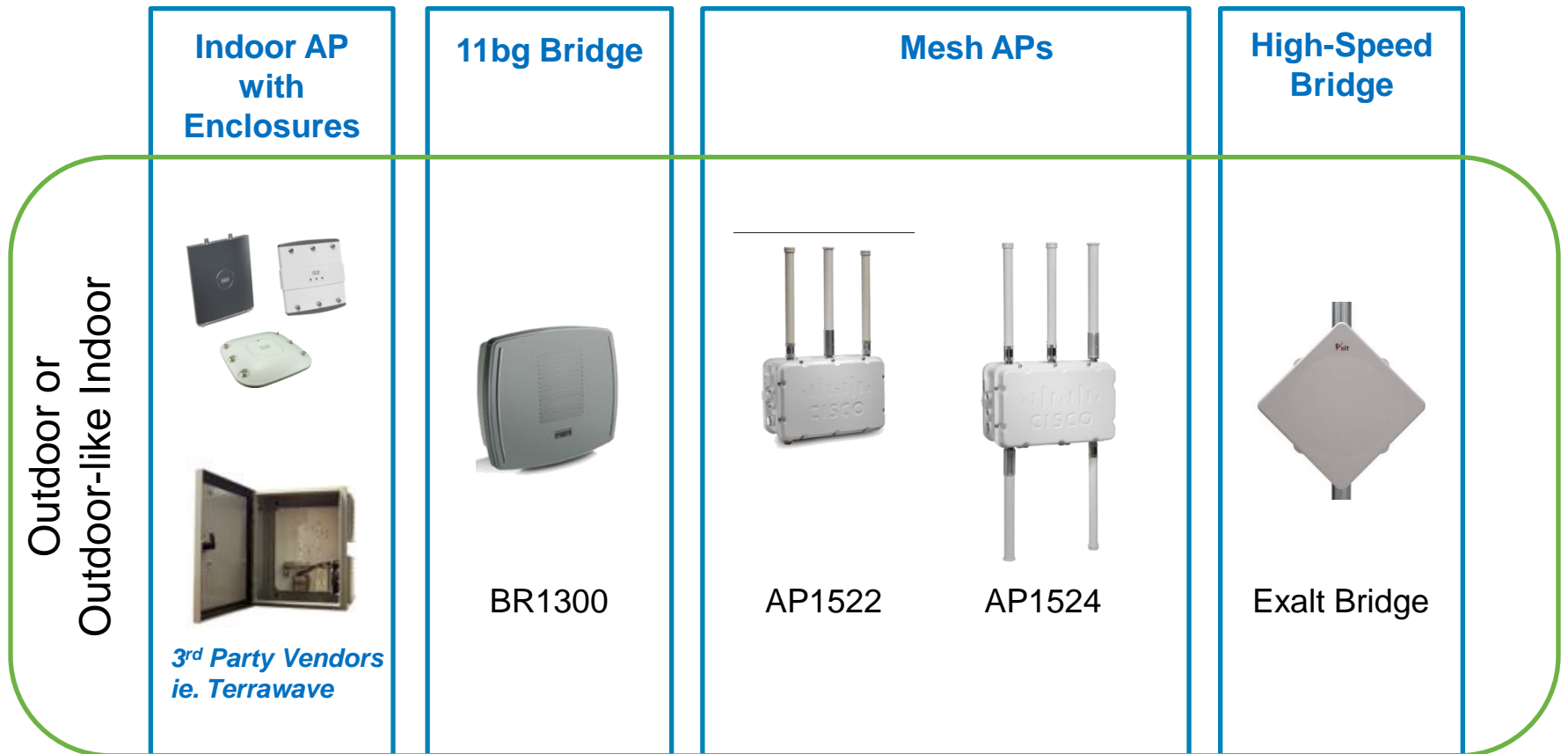
- Organizations that have employees in dense residential geographic locations

Interfaces

- 4 Additional Ethernet ports
 - Dedicated Ethernet port for corporate-bound device
 - Remaining 3-ports are for personal use
- USB port is disabled initially
- Cradle for vertical placement
- On/Off Switch
- No PoE support



Outdoor AP Portfolio



Cisco Aironet 1550 Series Outdoor Access Point

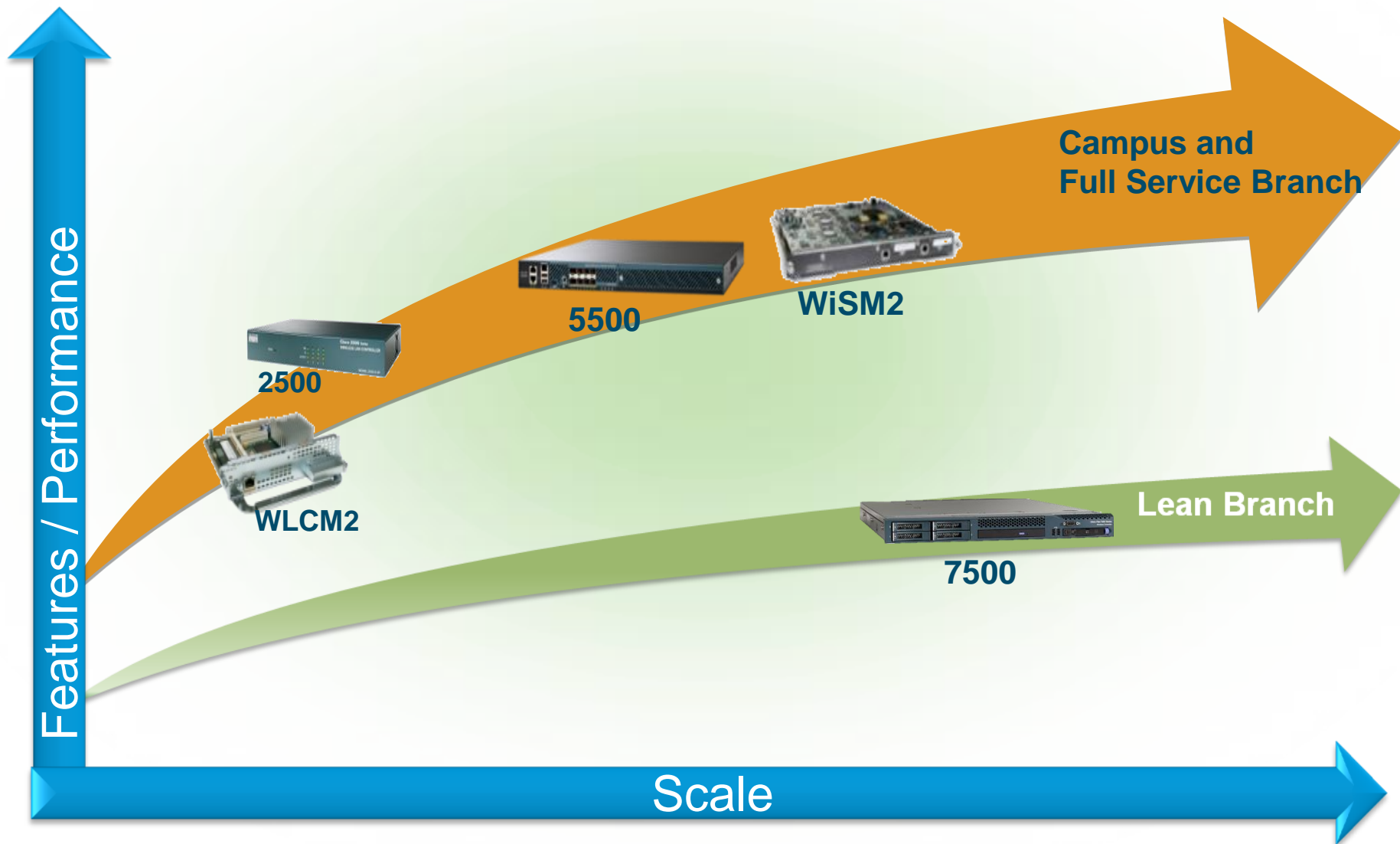


- 2 Radios 2.4/5 GHz
- 2 Tx, 3 Rx
- MIMO, 2 SS
- 3x Dual-Band Ant.



	1552E	1552H	1552C	1552I
2.4 GHz	802.11 b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n
5 GHz	802.11 a/n	802.11a/n	802. 11a/n	802.11a/n
Type	Standard	Hazardous Loc.	Cable Modem	Standard
Antenna	External	External	Integrated	Integrated

Current controller portfolio positioning



Cisco Wireless Controller Module 2 on SRE

- Maximize on ISR G2 Investment

Lower Cap-Ex/Op-Ex

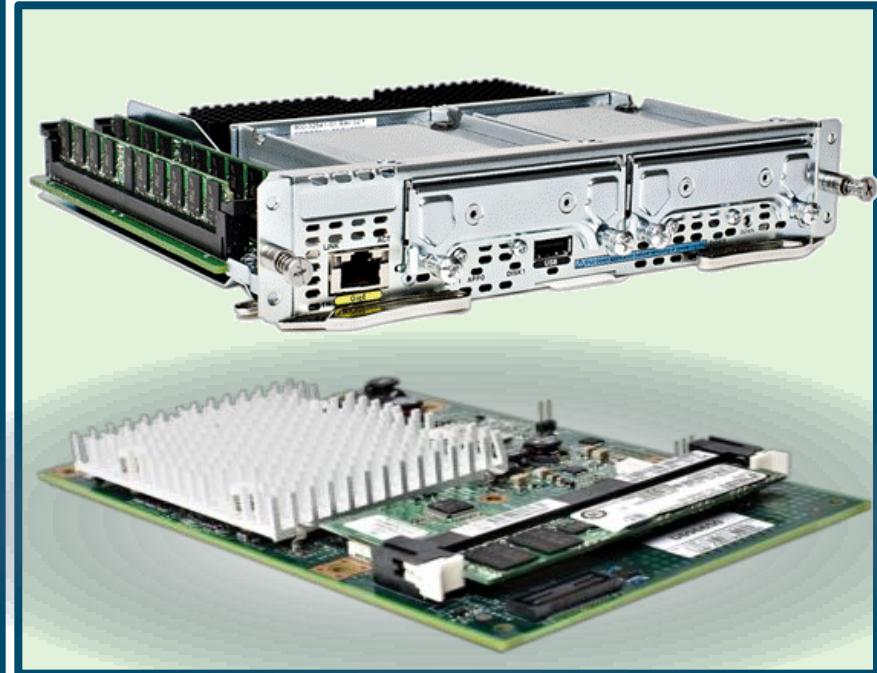
Wired/Wireless solution

- Wireless Entry level Controller Performance on ISR platform

802.11n Ready

Support high end RF Excellence (CleanAir APs)

5500 Style Licensing



Specifications At-a-Glance

Access Points	5 – 50
Devices	500
Throughput	300Mbps
Form Factor	SRE Module on ISR G2
I/O	ISR backplane

Enterprise-grade WLC for the Campus

Cisco 5500 Series Wireless Controller



Competitive Differentiation

- Best in class performance
 - Industry leading performance with encryption
- Enhanced Operational Savings
 - Upgrades or fails 500 AP within mins
- Enhanced rich media performance
 - Multiple concurrent low-latency media flows

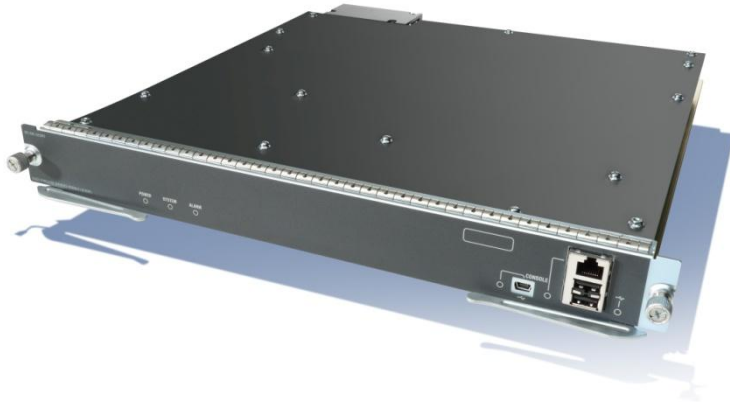
Access Points	12 - 500
Clients	7,000
Form-factor	1 RU
IO Interface	8x 1GE ports, LAG
Upgrade Licenses	25,50,100,250
Power consumption	125W

Recognizing Opportunities

- Customer planning to install Greenfield enterprise-grade wireless on campus to enable smartphones, tablets and laptops
- Nearing refresh cycle on 4400 series WLC planning 11a/g to 11n migration

Enterprise-grade WLC for the Campus

Wireless Services Module 2 for Catalyst 6500



Access Points	100-1000
Clients	15,000
Chassis Level Scale	7000 APs 70,000 Clients
IO Interface	20 GE
Upgrade Licenses	100, 200
Power	225 W

Competitive Differentiation

- Best in class performance
 - Industry leading performance with encryption
- Enhanced Operational Savings
 - Upgrades or fails-over 500 AP within minutes
- Single point of service application
 - Consistent wired-wireless policies, firewall, network analysis or redundancy
- Enhanced rich media performance
 - Multiple concurrent low-latency media flows

Recognizing Opportunities

- Customer planning to install Greenfield enterprise-grade wireless on campus to enable smartphones, tablets and laptops
- Nearing refresh cycle on Cat6k or WiSM blades or planning 11a/g to 11n migration
- Consolidation of services at the core

WiSM2

Continue to lead the market in scale and performance



Sup2T Support

Release	WiSM2	Timeframe
15.0(1) SY	7.0.x (500 AP)	Shipping
15.0(1) SY1	7.2 (1KAP)	Q1CY2012

WiSM NOT supported with Sup2T

Sup720 Support

Release	WiSM2	Timeframe
12.2(33)SXJ1	7.0.x (500 AP)	Shipping
12.2(33)SXJ2	7.2 (1K AP)	Q1CY2012



Performance

Up to 20 Gbps
Ties in with AP3600

Number of
Access Points

Up to 1000

Clients

Up to 15,000

Maximum # of APs
in a Chassis

Up to 7000

Mobility
Domain Size

Up to 36,000 APs

Mixed mode within same chassis supported:
 WiSM with 7.0.116.0, WiSM2 with 7.2(or beyond)
 Price of WiSM2-1K = \$167,995

Software Features Highlights



7.2 Feature-List

IPv6

- IPv6 Client Support
- Router Advertisement Guard
- DHCPv6 Server Guard
- IPv6 Source Guard
- IPv6 ACL Support
- IPv6 Neighbor Discovery Caching
- Guest Access for Dual Stack Clients
- IPv6 Multicast Support
- IPv6 Quality of Service Mapping
- NCS Support for IPv6

FlexConnect

- Flex7500 Enhancements
- AAA Overwrite
- ACLs
- P2P Blocking
- Smart AP Image Upgrade

TrustSec

- Device Registration
- LWA with Posture
- CWA with Posture
- SGT Exchange Protocol (SXP)

Other

- WiSM2 - Scalability enhancements
- VLAN Select - new algorithm
- Rogue Detection - minimum RSSI
- VideoStream - Performance Improvements
- Stadium Vision - Configuration Tweaks
- TPC - v2 for dense Voice deployments
- RF-Profiles



Cisco Prime Network Control System (NCS)

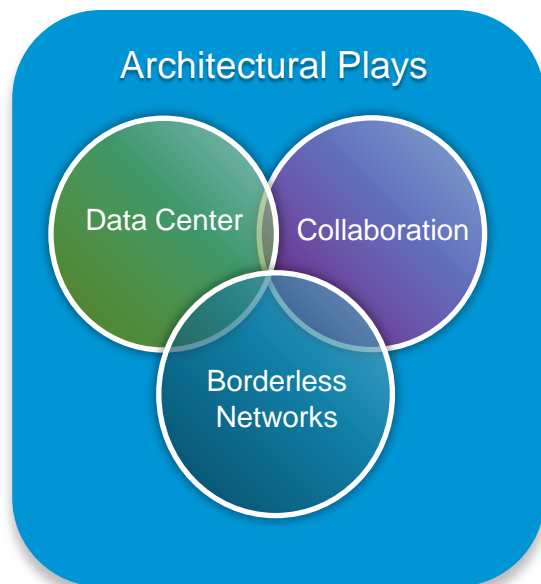


Cisco Prime Portfolio

Cisco Prime -> Cisco Prime Infrastructure -> Cisco Prime NCS

Cisco Prime

Enterprise Product Portfolio



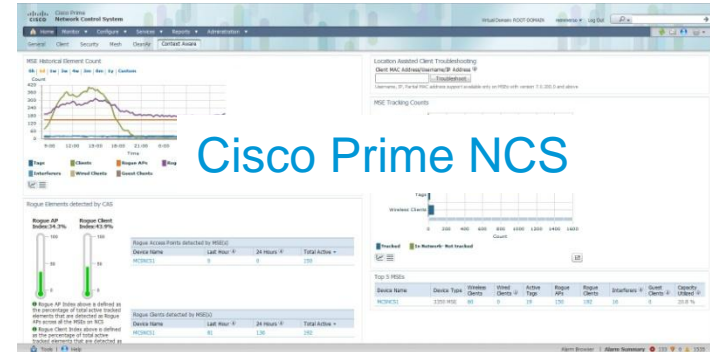
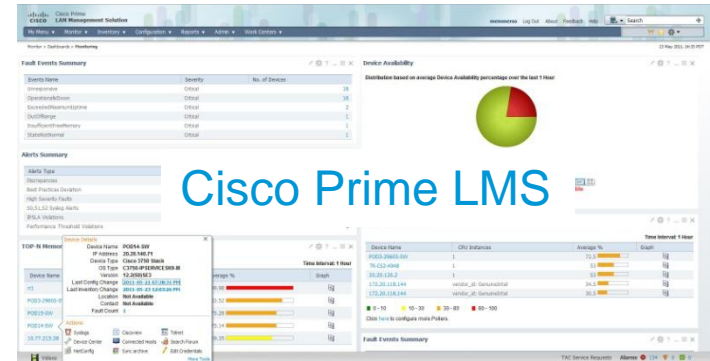
- Cisco Prime Infrastructure
 - Cisco Prime LMS
 - Cisco Prime NCS
- Cisco Prime CM
 - (Collaboration Manager)
- Cisco Prime NAM
 - (Assurance Manager)
- Cisco Prime UCMS
 - (UC Manager)

Unified Management Across Architectures, Networks, and Services

Cisco Prime Infrastructure

Integrated wired/wireless lifecycle management

- A bundled solution for complete wired and wireless lifecycle management
- Unified wired/wireless access management
- Configuration, change and compliance management
- Monitoring and troubleshooting



- ✓ Simplified ordering and license management
- ✓ Speed troubleshooting, improve network availability
- ✓ Lower TCO with intuitive user experience and workflows

Cisco Prime Infrastructure Bundle

Customer Experience

- Customer buys Prime Infrastructure SKUs (no more a la carte SKUs)
- No change to licensing model or SKU structure – per-device right-to-manage
- Customer never has to double-purchase two products for the one device
- Installs applications as needed
- Upgrades based on SASx entitlement from NCS 1.x / LMS 4.x

Smooth Transition with Investment Protection

- SAS & SASU entitlements from NCS 1.x and LMS 4.x – same as today
- Paid upgrades from legacy WCS/LMS – same as today

Questions & Answers

Q: Are we giving product away?

A: No. The customer purchases a license per managed device - same as today

Q: Are we forcing the customer to pay for product they don't want/need?

A: No. The customer purchases licenses only for the devices they want to manage

Q: How does this address positioning and convergence concerns?

A: One future-proofed product to sell, SASU available for full investment protection



Cisco Prime NCS Roadmap

Mobility Release Alignment

Blue = Not EC'd

	Jan 2012	Q2CY12	Q3CY12
Controller, AP, MSE	7.2 Release	7.2MR1 Release	7.3 Release
Cisco Prime NCS	NCS 1.1	NCS1.1 MR	NCS 1.2
ISE	ISE 1.1	ISE 1.1MR	ISE 1.2

Management Strategy & Roadmap

RED = Not EC'd

- Support Best-in-Class pure play wireless offering
- Unify Management: Wired + Wireless
- Key enabler of Cisco Prime Vision

CY12

Jan 2012

NCS 1.1

- Kenwood WLC and AP Features
- Users & Clients: IPv6 Support
- Batch Report Creation
- Rogue Rules Customization
- Advanced Filtering of Client reports/pages
- Top Customer Requests

(Prelim) WCS EoS
Announcement Q1CY12

May 2012

NCS 1.1MR

- 7.2MR1 support

Aug 2012

NCS 1.2

- 7.3 feature support
- Northbound API
- 3rd party support
- Prime 360 Experience
- Wired config and image management
- ISR/ASR mgmt integration



NCS 1.1: New Features

Pipeline Features Breakdown – NCS 1.1

Committed – Q1CY12

Feature	Description	Target Delivery
Rogue Rules Customization	Ability to customize rogue rules on the controller based on SSID, RSSI and other parameters for better filtering of false positives, and associated NCS support for the feature.	NCS 1.1
Rogue AP Alarm Severity Customization	Ability to customize rogue AP alarm severity so it can be tied to email notifications in NCS – when this happens, you can choose to get alerted for malicious rogues only, vs. any rogue	NCS 1.1
Support for IPv6 (wired/wireless) clients	Support for IPv6 (wired/wireless) clients, configuration on WLC, and IPv6 dashlets and reports.	NCS 1.1
Batch Report Creation and Templatization	Ability to create a report template at the root domain, and turn it into a template for all member domains so a report can be created and populated to all domains under it.	NCS 1.1
Graphical display of historical client counts on AP pages	Ability to show graphical charts to trend client counts on AP detail pages	NCS 1.1
Multi-level filters in client reports	Use more than one filter in reports: Floor + SSID, for example	NCS 1.1
Advance Filters – client list page	Support advance filters in client list page – similar to the alarms page. Was deferred in NCS 1.0	NCS 1.1
7.2 WNBU release support	Support for WNBU 7.2 release	NCS 1.1
Many minor enhancements	List in SFS, or in Beta guide	NCS 1.1

IPv6 Support

- With the release of NCS 1.1, there are many additional capabilities that have been added to monitor and manage a network of IPv6 clients.
- NCS 1.1 supports centralized template-based configuration of IPv6 settings. These include:
 1. Neighbor Binding Timer
 2. RA Throttle Policy
 3. RA Filtering
- 4 new dashlets have been added to Home > Clients page for monitoring IPv6 clients:
 1. IP Address Type Distribution
 2. IPv6 Assignment Distribution
 3. Client Count by IP Address Type
 4. Client Traffic by IP Address Type

Rogue AP Enhancements

- Rogue classification interval
 - users will be allowed to configure time interval (called rogue classification interval)
 - serves two main purposes:
 - Transient rogue entries will not show in the controller.
 - Unnecessary memory allocation to transient rogues are avoided
- Minimum RSSI for rogue classification
 - Will be able to set the minimum RSSI that the AP needs to see the rogue at, in order for a rogue entry to be created at the WLC
- Rogue AP Ignore List
 - List is used to ignore the reported rogues by APs. User can add any rogue APs which they don't want controller to report.

Rogue AP Enhancements

- Rogue AP Alarm Severity configuration
 - NCS will enhance the Rogue AP alarm severity configuration by providing more granularities on severity configuration. So users can configure the rogue AP alarm severities according to the rogue AP's classification and state.
- RSSI information displayed on Rogue AP Event Detail page

Rogue AP Enhancements

Rogue Policy Setup

Template Applied	(None)
Rogue Location Discovery Protocol	Disable
Expiration Timeout for Rogue AP and Rogue Client Entries	1200 (secs)
Rogue Detection Report Interval	10 (secs)
Rogue Detection Minimum RSSI	-128 (dBm)
Rogue Detection Transient Interval (Enter 0 to disable)	0 (secs)
Validate rogue clients against AAA	<input type="checkbox"/> Enable
Detect and report Adhoc networks	<input checked="" type="checkbox"/> Enable

Can now specify how long rogue AP needs to be seen before being reported as rogue. Ability to specify min. RSSI value for rogue AP classification.

wIPS Enhancements

NCS 1.1 will support the following new signatures:

- Identical send and receive address (Alarm ID 178)
- Bad EAP-TLS frames (Alarm ID 181)
- HT-Intolerant degradation of service (Alarm ID 182)
- DoS: Probe response flood (Alarm ID 188)
- DoS: Re-association request flood (Alarm ID 189)
- DoS: Beacon flood (Alarm ID 195)
- DoS: MDK3-Destruction attack (Alarm ID 196)
- Karma tool detected (Alarm ID 197)
- WiFiTap tool detected (Alarm ID 198)



MSE Roadmap Update

MSE Primary Use Cases

- CleanAir
 - System wide interferer event correlation
 - Visualization of interferer zone of impact
 - History & playback and location of interferes
- WIPS & Adaptive WIPS
 - Locate rogues
 - Comprehensive over-the-air attack detection (DoS & Security Penetration)
- Context-Aware
 - Visibility & performance monitoring
 - Asset Management
 - Location enabled mobile apps

CleanAir With MSE

With MSE

System wide Interferer Details & Event Correlation*
Lowers Problem Resolution Time/Cost

Zone of Impact & Interferer Notification
Improved Visibility & Reduces Resolution Time/Cost

History & Playback
investigate past problems

Locates Non Wi-Fi interferers & Rogues
Improved Security



Without MSE

Interferer details & event correlation not readily available

No visibility to Interferers and their impact

No historical data for troubleshooting purposes

Can not locate rogue devices and interferers / Non-Std Wi-Fi thus compromising network security

* Useful when customers have more than one WLC

Positioning Monitor Mode & Enhanced Local Mode

Monitor Mode

Does not serve clients. Dedicated AP for full time monitoring.
Faster rogue intercept times

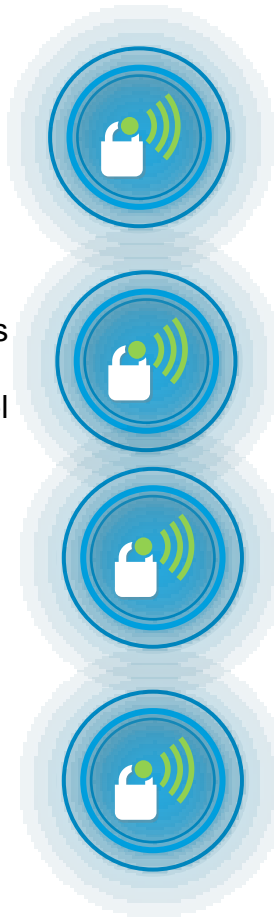
Scans all channels for longer duration looking for threats

More data for better forensic analysis on & off channel

Requires one Monitor Mode AP for every 5 data serving APs

Requires additional infrastructure

Ideal for customers who want faster rogue intercept time or have a separate security group that mandates overlay monitoring



Enhanced Local Mode (ELM)

AP doubles for data serving and monitoring.

Better on-channel protection

Stays on-channel and scans off-channel as best effort.

More data for better forensic analysis on-channel

Does not require any additional APs. Requires aWIPS licensing on all APs

No additional infrastructure required

Ideal for price sensitive customers who all looking for the best on-channel protection without requiring to add APs or sensors

7.2 MSE Features

Investment Areas	7.2 (January 2012)
BYOD	
Architectural Flexibility	<ul style="list-style-type: none">- HA- Virtual Appliance- Location support on HREAP- IPv6 support
Wireless As Primary Access	<ul style="list-style-type: none">- Rogue detection enhancements- New signatures- Wi-Fi Direct detection & classification- Simplified configuration

HA & Virtual Appliance - Details

❑ MSE HA

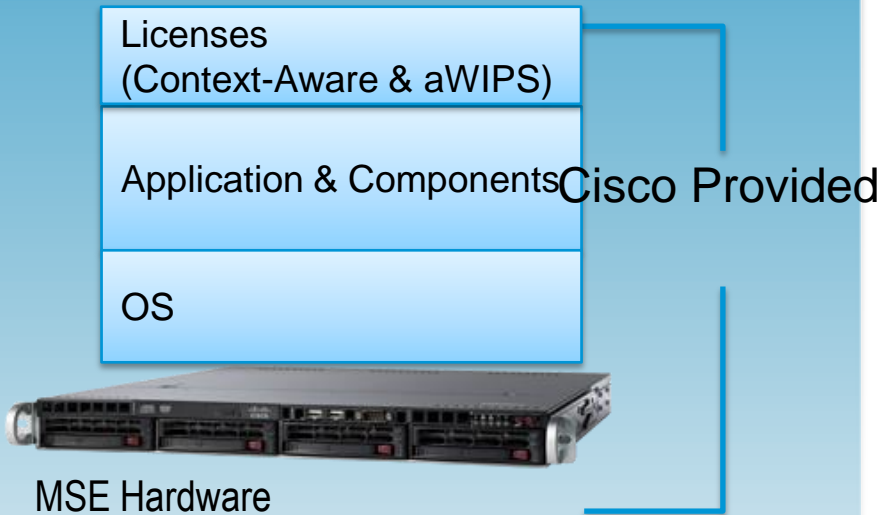
- No HA license or a second set of client/ WIPS license required
- Requires Secondary hardware
- Supports 1:1 & 2:1 configuration (2 primaries can be backed to one secondary)
- HA for all services supported; Failover times < 1 min
- Supports automatic & manual failover / failback
- Physical to physical & virtual to virtual HA supported

❑ MSE Virtual Appliance

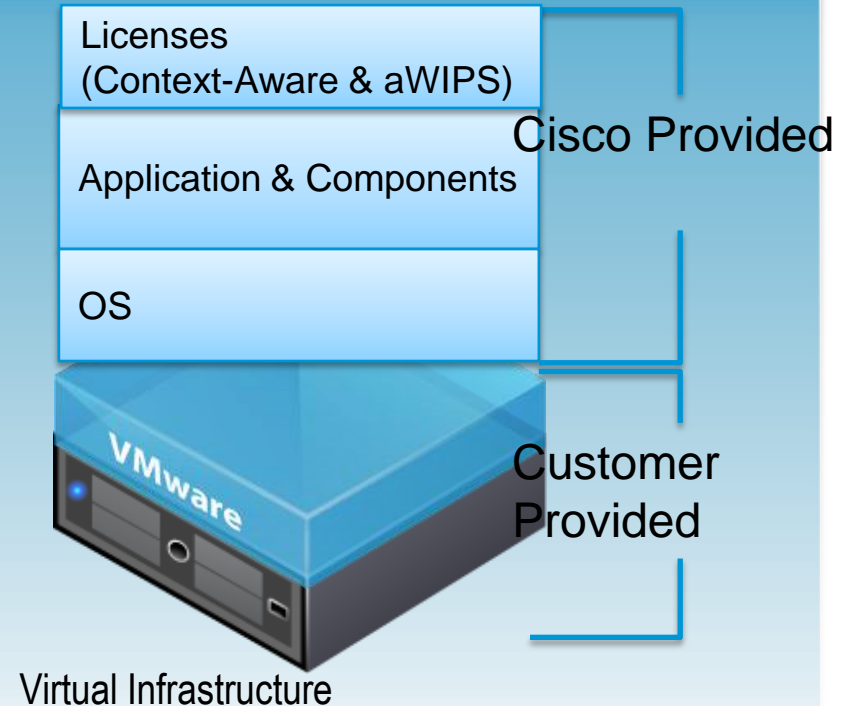
- Will require activation license + CAS / WIPS license
- No change to CAS/ WIPS pricing
- All licenses will be only available by e-delivery
- Virtual appliance will be distributed as OVA image
- Only SASU required & will have Average Configuration Price (ACP)
- Two reference server configs supported , similar to NCS (UCS C210/250 M2)
- Supported on ESX & ESXi 4.1

Appliance Delivery Models

Physical Appliance (Existing)



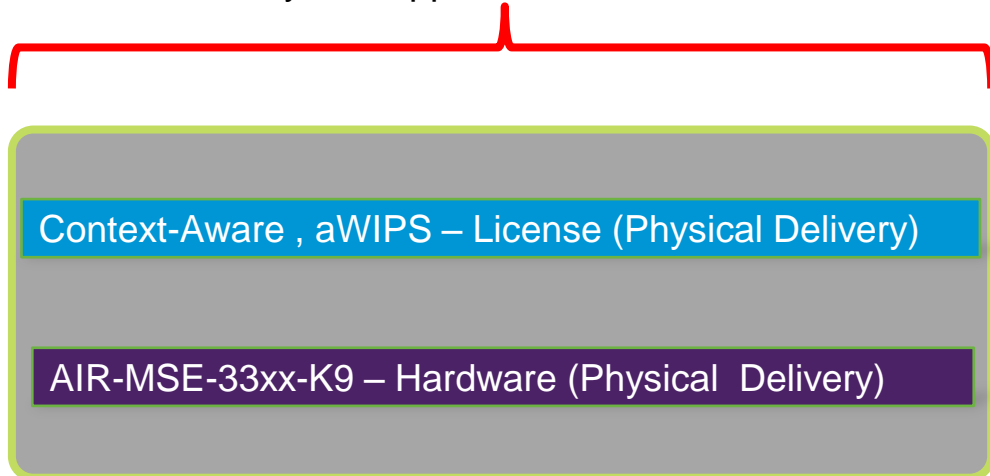
Virtual Appliance



Physical and Virtual Appliance Supported

Product Configuration

Physical Appliance



A diagram for Physical Appliance configuration. It features a large grey rounded rectangle with a light green border. Inside, there are two horizontal bars: a blue one at the top and a purple one at the bottom. A red bracket is positioned above the rectangle, spanning its width.

Context-Aware , aWIPS – License (Physical Delivery)

AIR-MSE-33xx-K9 – Hardware (Physical Delivery)

Services

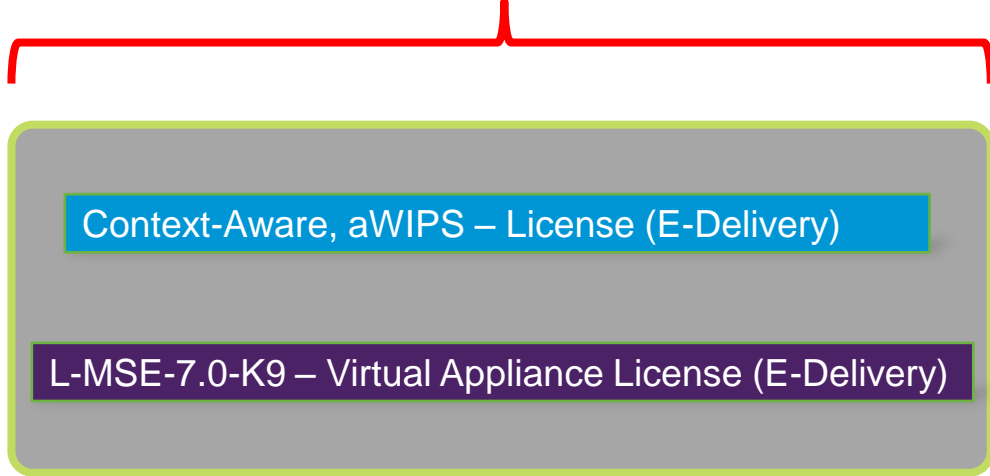


A diagram for Physical Appliance services. It features two rounded rectangular boxes stacked vertically. The top one is light grey and the bottom one is light blue. A red bracket is positioned above the boxes, spanning their width.

SASU for software upgrades & support

SmartNet

Virtual Appliance



A diagram for Virtual Appliance configuration. It features a large grey rounded rectangle with a light green border. Inside, there are two horizontal bars: a blue one at the top and a purple one at the bottom. A red bracket is positioned above the rectangle, spanning its width.

Context-Aware, aWIPS – License (E-Delivery)

L-MSE-7.0-K9 – Virtual Appliance License (E-Delivery)

Services



A diagram for Virtual Appliance services. It features a single light grey rounded rectangular box. A red bracket is positioned above the box, spanning its width.

SASU for software upgrades & support

Product Specifications

Item	Specification
VMWare ESXi Version (Virtual Appliance on a Customer-Supplied Server)	VMWare ESX & ESXi version 4.1
Minimum Server Requirements	<p>Cisco MSE High-End Virtual Appliance</p> <ul style="list-style-type: none">- 50,000 Context-Aware License- 10,000 aWIPS License• Minimum RAM: 20GB• Minimum Hard disk space allocation: 500GB• Physical cores: 12 at 2.93GHz or better (2x Intel Xeon X5570) <p>Cisco MSE Standard Virtual Appliance</p> <ul style="list-style-type: none">- 18,000 Context-Aware License- 5,000 aWIPS License• Minimum RAM: 11GB• Minimum Hard disk space allocation: 500GB• Physical cores: 8 at 2.93GHz or better (2x Intel Xeon X5570) <p>Cisco MSE Low-End Virtual Appliance</p> <ul style="list-style-type: none">- 2,000 Context-Aware License- 2,000 aWIPS License• Minimum RAM: 6GB• Minimum Hard disk space allocation: 500GB• Physical cores: 2 at 2.93GHz or better (2x Intel Xeon X5570)

Virtual Appliance Reference HW Configs

- UCS C210 M2 Rack Mount Server
 - 2 * Intel Xeon(R) CPU E5640 @ 2.67GHz
 - SAS Drives (min 500GB) with Enhanced RAID controllers

- UCS C250 M2 Rack Mount Server
 - 2 * Intel Xeon(R) CPU X5670 @ 2.93GHz
 - SAS Drives (min 500GB) with Enhanced RAID controllers

MSE Virtual Appliance Pricing

Description	SKU	List
MSE Virtual Appliance	L-MSE-7.0-K9	\$4,995

Description	SKU	List
CleanAir Analyst - 50 AP (E Delivery)	L-CCA-7.0-50-K9	\$7,495
CleanAir Analyst - 100 AP (E Delivery)	L-CCA-7.0-100-K9	\$9,995
CleanAir Analyst - 500 AP (E Delivery)	L-CCA-7.0-500-K9	\$15,995
MSE Virtual Appliance Bundle (Includes 25 AP WIPS ELM & 3k Client Lic)	L-MSE-7.0-C3-W25	\$16,790

No e-delivery option for AeroScout SKUs

Virtual Appliance E-Delivery SKUs

Description	SKU	List
CAS	SKU	List
Context Aware Lic For 1000 Devices (RSSI based) - E Delivery	L-CAS-1KC (=)	\$2,500
Context Aware Lic For 3000 Devices (RSSI based) - E Delivery	L-CAS-3KC (=)	\$6,000
Context Aware Lic For 6000 Devices (RSSI based) - E Delivery	L-CAS-6KC (=)	\$11,000
Context Aware Lic For 12000 Devices (RSSI based) - E Delivery	L-CAS-12KC (=)	\$19,000
aWIPS	SKU	List
Wireless IPS Lic For 5 Monitor Mode AP- E Delivery	L-MM-WIPS-5 (=)	\$2,995
Wireless IPS Lic For 25 Monitor Mode AP- E Delivery	L-MM-WIPS-25 (=)	\$5,795
Wireless IPS Lic For 100 Monitor Mode AP- E Delivery	L-MM-WIPS-100 (=)	\$16,995
Wireless IPS Lic For 500 Monitor Mode AP- E Delivery	L-MM-WIPS-500 (=)	\$49,995
Wireless IPS Lic For 2000 Monitor Mode AP- E Delivery	L-MM-WIPS-2000 (=)	\$99,995
Wireless IPS Lic For 5 Enhanced Local Mode AP- E Delivery	L-LM-WIPS-5 (=)	\$2,995
Wireless IPS Lic For 25 Enhanced Local Mode AP- E Delivery	L-LM-WIPS-25 (=)	\$5,795
Wireless IPS Lic For 100 Enhanced Local Mode AP- E Delivery	L-LM-WIPS-100 (=)	\$16,995
Wireless IPS Lic For 500 Enhanced Local Mode AP- E Delivery	L-LM-WIPS-500 (=)	\$49,995
Wireless IPS Lic For 2000 Enhanced Local Mode AP- E Delivery	L-LM-WIPS-2000 (=)	\$99,995



CleanAir Analyst

Jagdish Girimaji

Why & What is CleanAir Analyst?

- It's difficult to articulate the value proposition of MSE for CleanAir
- CleanAir Analyst is a MSE bundle with the right amount of licenses to address 50AP, 100AP and 500AP CleanAir deployments

	SKU	List
--	-----	------

50 AP CleanAir Analyst (Includes MSE-3310 & 1K Context-Aware License)	AIR-CCA-50	\$9,495
--	------------	---------

	SKU	List
--	-----	------

100 AP CleanAir Analyst (Includes MSE-3310 & 2K Context-Aware License)	AIR-CCA-100	\$11,995
---	-------------	----------

	SKU	List
--	-----	------

500 AP CleanAir Analyst (Includes MSE-3355 & 6K Context-Aware License)	AIR-CCA-500	\$32,995
---	-------------	----------

CleanAir Analyst

Self Healing and
Optimizing

Wireless
Security



Forensics for
Troubleshooting



Requires CleanAir Analyst to get all the benefits of Forensics & Wireless Security

Policy
Enforcement

CleanAir Analyst

With CleanAir Analyst

System wide Interferer Details & Event Correlation*

Lowers Problem Resolution Time/Cost



Without CleanAir Analyst

Interferer details & event correlation not readily available



No visibility to Interferers and their impact

History & Playback

investigate past problems



No historical data for troubleshooting purposes

Locates Non Wi-Fi interferers & Rogues

Improved Security



Can not locate rogue devices and interferers / Non-Std Wi-Fi thus compromising network security

* Useful when customers have more than one WLC

Interferer Summary

View a system wide summary of interfering devices including the following information:

Interferers [Edit View](#)

Monitor > Interferers

Search Criteria: Active Interferers only, Detected within last 5 minutes ([Edit Search](#))

Entries 1 - 16 of 16

Interferer ID	Type	Status	Severity	Affected Band	Affected Channels	Duty Cycle (%)	Discovered	Last Updated	Floor
c1:22:da:00:1d:90	Bluetooth Link	Active	N/A	Unknown	N/A	1	6/27/11 11:41:28 AM	6/27/11 11:41:28 AM	Cisco SJ-5 > Bld-14 > 4
c1:22:da:00:1d:5f	DECT Like Phone	Active	2	2.4 GHz (802.11b/g/n)	1	1	6/27/11 11:38:24 AM	6/27/11 11:41:25 AM	Cisco SJ-5 > Bld-14 > 3
c1:22:da:00:1d:75	Bluetooth Link	Active	2	2.4 GHz (802.11b/g/n)	6	1	6/27/11 11:39:54 AM	6/27/11 11:40:55 AM	Cisco SJ-5 > Bld-14 > 1
c1:22:da:00:1d:79	Bluetooth Link	Active	N/A	2.4 GHz (802.11b/g/n)	11	1	6/27/11 11:39:59 AM	6/27/11 11:39:59 AM	
c1:22:da:00:1d:7e	WIMAX Fixed	Active	2	2.4 GHz (802.11b/g/n)	1	1			
c1:22:da:00:1d:80	Bluetooth Discovery	Active	N/A	2.4 GHz (802.11b/g/n)	6	N/A			
c1:22:da:00:1d:82	Bluetooth Link	Active	N/A	2.4 GHz (802.11b/g/n)	6	1			
c1:22:da:00:1d:83	Bluetooth Link	Active	N/A	2.4 GHz (802.11b/g/n)	1, 6	1			
c1:22:da:00:1d:84	Bluetooth Link	Active	2	2.4 GHz (802.11b/g/n)	11	1			
c1:22:da:00:1d:86	Bluetooth Link	Active	N/A	2.4 GHz (802.11b/g/n)	1, 6	1			
c1:22:da:00:1d:87	Bluetooth Link	Active	N/A	2.4 GHz (802.11b/g/n)	1	1			
c1:22:da:00:1d:88	Bluetooth Link	Active	N/A	2.4 GHz (802.11b/g/n)	1	1			
c1:22:da:00:1d:8a	Continuous Transmitter	Active	N/A	2.4 GHz (802.11b/g/n)	11	100			
c1:22:da:00:1d:8b	Bluetooth Link	Active	N/A	2.4 GHz (802.11b/g/n)	6	1			
c1:22:da:00:1d:8c	Microwave Oven	Active	N/A	Unknown	N/A	26			
c1:22:da:00:1d:8f	Microwave Oven	Active	N/A	2.4 GHz (802.11b/g/n)	6	21			

Entries 1 - 16 of 16

Alarm Summary

	Critical	Major	Minor
Alarm Summary	31	1	1676
AP	5	0	22
Controller	14	0	0
Coverage Hole	0	0	0
Mesh Links	0	0	0
Mobility Service	0	1	0
NCS	0	0	3
Performance	0	0	0
Rogue AP	0	0	1647
Security	12	0	4

- CleanAir Analyst provides an easy comprehensive view of all the interferers
- Results in reduced problem resolution time and lower operational expenses

Interferer Details

View details of interfering devices detected with location information and event correlation

The screenshot displays the Cisco CleanAir Analyst web interface. At the top, there is a navigation bar with 'Monitor', 'Reports', 'Configure', 'Services', 'Administration', 'Tools', and 'Help'. The main content area is titled 'Interferer Details: Microwave Oven '59:68:e0:04:2c:9b''. Below this, there are three main sections: 'Interferer Properties', 'Location', and 'Clustering Information'. The 'Interferer Properties' section lists details such as Type (Microwave Oven), Status (Active), Severity (10), Duty Cycle (9%), Affected Band (2.4 GHz), and Affected Channels (11). The 'Location' section shows the Floor (System Campus > SJC-22 > 1st Floor) and the On MSE (Alpha-MSE2). The 'Clustering Information' section shows the Controller (10.32.37.6) and the Detecting APs (SJC22-12A-AP3 and SJC22-32A-AP18). Red circles highlight the 'Location' section and the 'Detecting APs' list.

Interferer Properties	
Type	Microwave Oven Show interferers of this type
Status	Active
Severity	10
Duty Cycle (%)	9
Affected Band	2.4 GHz (802.11b/g/n) Show interferers affecting this band
Affected Channels	11
Discovered	Mon May 23 13:20:36 PDT 2011
Last Updated	Mon May 23 13:23:35 PDT 2011

Location	
Floor	System Campus > SJC-22 > 1st Floor Show interferers on this Floor
Last located at	May 23, 2011 1:23:35 PM
On MSE	Alpha-MSE2 (3310 MSE)

Clustering Information	
Clustered By	Controller (10.32.37.6)
Detecting APs	
AP Name / MAC	
SJC22-12A-AP3 (Cluster Center)	
SJC22-32A-AP18	

- CleanAir Analyst provides location of interferers & event **correlation**
- With event **correlation** - one event is reported when the same interfere is detected by multiple APs/WLCs

Zone of Impact

View location of Interferer and it's zone of impact. Also see other NW elements with ability to filter Icons and Details



- CleanAir Analyst provides interferer / event visibility and the zone of impact for each interferer
- Customers can focus on the most severe interferer

Interferer Notification

Clean Air Analyst allows system wide tracking of interferers and provides alerts


Notification Summary

Services > Context Aware Notifications > Notification Summary

 Active count refers to total active notifications.

Absence	Last Hour	24 Hours	Active
All Notifications	0	0	0
Client Stations	0	0	0
Asset Tags	0	0	0
Rogue Clients	0	0	0
Rogue AccessPoints	0	0	0
Interferers	0	0	0

In/Out Area	Last Hour	24 Hours	Active
All Notifications	0	0	0
Client Stations	0	0	0
Asset Tags	0	0	0
Rogue Clients	0	0	0
Rogue AccessPoints	0	0	0
Interferers	0	0	0

Location Change Events 	Last Hour	24 Hours	Active
All Notifications	0	0	0
Client Stations	0	0	0
Asset Tags	0	0	0
Rogue Clients	0	0	0
Rogue AccessPoints	0	0	0
Interferers	0	0	0

Movement from Marker	Last Hour	24 Hours	Active
All Notifications	0	0	0
Client Stations	0	0	0
Asset Tags	0	0	0
Rogue Clients	0	0	0
Rogue AccessPoints	0	0	0
Interferers	0	0	0

Battery Level	Last Hour	24 Hours	Active
All Notifications	0	0	0
Asset Tags	0	0	0

Emergency	Last Hour	24 Hours	Active
All Notifications	0	0	0
Asset Tags	0	0	0

Checkpoint Notifications	Last Hour	24 Hours	Active
All Notifications	0	0	0
Asset Tags	0	0	0

- Customers can get interferer notification based on location
- Notification types include – Absence, Change in Location and In/Out of a defined area

History & Playback


Bluetooth Link '59:68:e0:04:2c:ce'

Monitor > AP_Detected_Interferers > Bluetooth Link'59:68:e0:04:2c:ce' > Location History

Interferer Information	
Data Collected at	Mon May 23 2011 13:24:03 GMT-0700 (PDT)
Type	Bluetooth Link
Severity	N/A
Duty Cycle (%)	1
Affected Channels	11

Interferer Location History (From : Mon May 23 2011 13:24:06 GMT-0700 (PDT) To : Mon May 23 2011 13:24:47 GMT-0700 (PDT))		
Change selection every	2 secs	Play Stop
Entries 1 - 2 of 2		
Time Stamp	Floor	
1 Mon May 23 2011 13:24:47 GMT-0700 (PDT)	System Campus > SJC-22 > 3rd Floor	
2 Mon May 23 2011 13:24:06 GMT-0700 (PDT)	System Campus > SJC-22 > 3rd Floor	

Location
Location Calculated Mon May 23 2011 13:24:06 GMT-0700 (PDT)
at (PDT)
Floor System Campus > SJC-22 > 3rd Floor



- CleanAir Analyst saves interferer/event information and allows customers to replay events over a slice of time for forensic analysis
- Helps improve operational excellence and network performance

Thank you.

