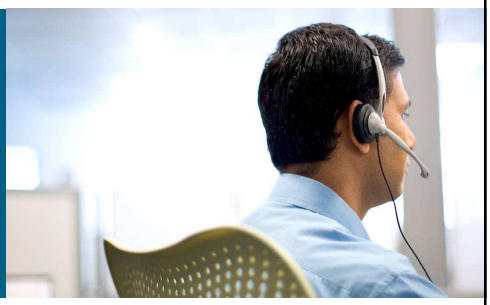
Cisco Wireless Solutions



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Agenda

- 802.11a/b/g/n Update
- Wireless Security
- Mobility Services Engine
  - Adaptive Wireless IPS
  - Location Tracking (Context Aware)
  - Mobile Intelligent Routing
  - Client Management Services
- Mesh

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802.11n
Technical Update

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Technical Elements of 802.11n

MIMO	40Mhz Channels	Packet Aggregation	Backward Compatibility

MIMO	40Mhz Channels	Packet Aggregation	Backward Compatibility

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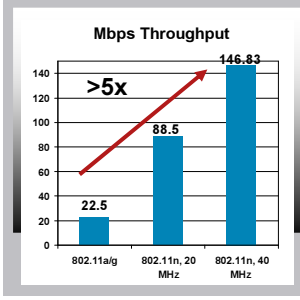
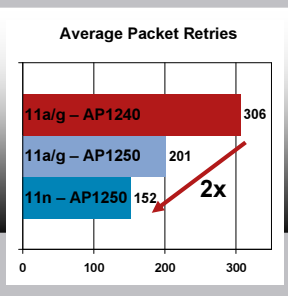
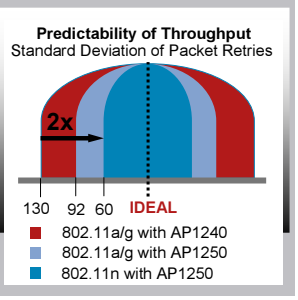
802.11n
It's About a Whole Lot More Than Speed

Throughput	Reliability	Predictability
5x 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







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802.11n
Cisco Next Generation Wireless Solution

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The Aironet 1250 Series Access Point

- Industry's first Wi-Fi Certified 802.11n draft 2.0 access point
- Modular platform
  - Field upgradeable radio modules/future technologies
- Higher speed WLAN technologies
  - Faster CPU to handle higher data throughput
  - Increased memory for expanded feature set
  - 10/100/1000 Ethernet port
- Available in Unified (LWAPP) and Standalone versions

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New Antennas for Aironet 1250 Series

- Omnidirectional
  - Single enclosure with 3 antenna elements
    - 2.4 GHz 3dBi (AIR-ANT2430V-R)
    - 5 GHz 4 dBi (AIR-ANT5140V-R)

- Dipoles
  - New dipole without hinge (gray)
    - 2.4 GHz 2.2 dBi (AIR-ANT2422DG-R)
    - 5 GHz 3.5 dBi (AIR-ANT5135DG-R)
  - Also supports existing dipoles with hinge (black & white)

- Blue dot indicates 5 GHz

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Size matters

- Modular Radio Design = future proofing, new technologies
- Proper RF separation between Transmit/Receive antennas
- Heat sync to dissipate heat appropriately
- Rugged, industrial grade quality metal components

Superior antenna choice – dedicated antennas to each radio

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Cascade/1140 Series

Product Highlights:

- **Attractive form factor**
- **Draft 2.0 802.11n**
- **Integrated radios, antennas**
- **Designed to run full 802.11n features using 802.3af power**
- **10/100/1000 Ethernet port**
- **CAPWAP support**
- **Plenum rated**

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Designed with a similar form as the AP-1130

Designed as a replacement / upgrade for the AP-1130

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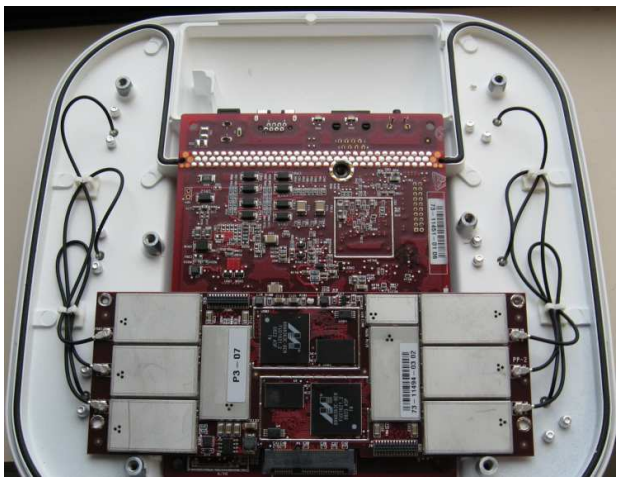
1140 inside view



Access Point inside view

If you have an AP that is 2.4 GHz only the 5 GHz radio module won't be present. Also note the conductive RF Gasket in black around unit.

It is factory torque fitted so this gasket seals properly

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Aironet AP Portfolio Comparison

	AP1130	AP1140	AP1240	AP1250
Modular	No	No	No	Yes
Data Uplink (Mbps)	10/100	10/100/1000	10/100	10/100/1000
Power Requirement	11.1 W	802.3af, draft 802.3at	12.95 W	802.3af*, draft 802.3at
Installation	Standard	Standard	Rugged	Rugged
Antennas	Internal	Internal	External	External
Support for 802.11n	No	Yes	No	Yes
DRAM	32 MB	128 MB	32 MB	64 MB
Flash	16 MB	32 MB	16 MB	32 MB

•802.3af Powers AP1250 with 1 radio only
or 1 spacial stream

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New Antenna Overview

- **2.4 GHz/ 5 GHz dual band antenna:**
  Aesthetically pleasing
  Indoor dual band APs
  AIR-ANT2451V-R=
  3 dBi in 2.4 GHz, 3.5 dBi in 5 GHz
  Available with Franciscan
  List $350

- **2.4 GHz sector antenna:**
  Indoor, outdoor AP usage
  RP-TNC connector with plenum rated cable
  5dBi sector antenna with 135 degree radiation pattern
  AIR-ANT2450S-R=
  Sector Antenna available Grgich Hills
  List $225

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Wireless Security

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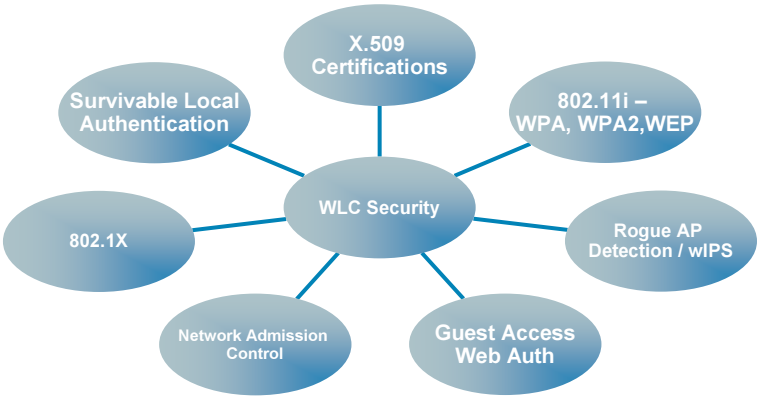
LWAPP Security Support



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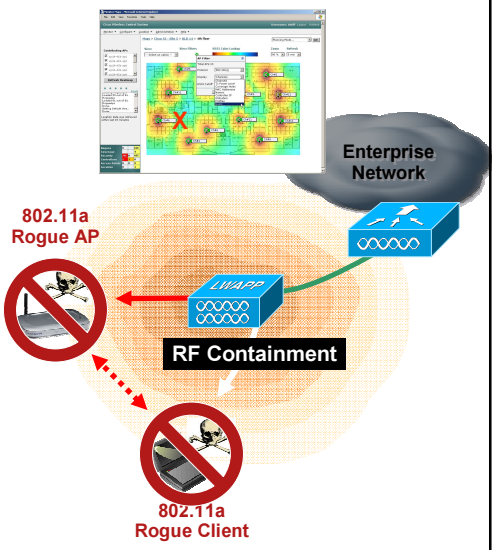
Cisco Unified Wireless Network Rogue Detection Protects Your Business

- Automatically detects:
  - –Rogue access points and clients
  - –Ad hoc networks
  - –Denial of service attacks
  - –Client mis-associations
- Intelligent RF scanning = cost effective solution
- Intrusion prevention under IT control
- Location appliance provides precision mapping for physical removal



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Rogue Detection

- **Passive Operation –**
  - **–Scans all channels**
- **RLDP (Rogue Location Discovery Protocol) – is rogue on wired network**
- **Containment – send deauths to clients associated to rouge AP**
- **Air monitors not required**
- **Classification**
- **Switch Port Trace**

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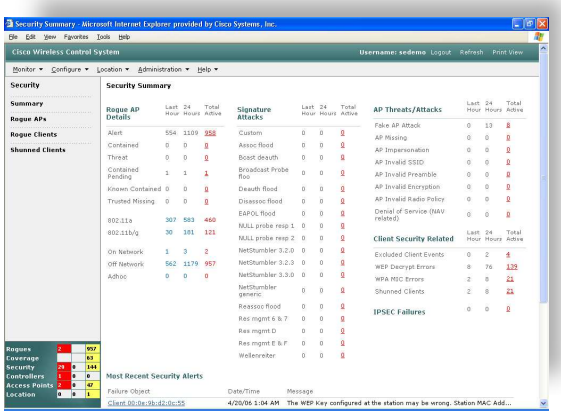
Real-Time Intrusion Protection (IPS)

- Signature Library – flat file – easy to update
- Cisco resources dedicated to maintaining library updates
- No WLAN down-time
- Customization available
- Scan all channels
- No separate air monitors required



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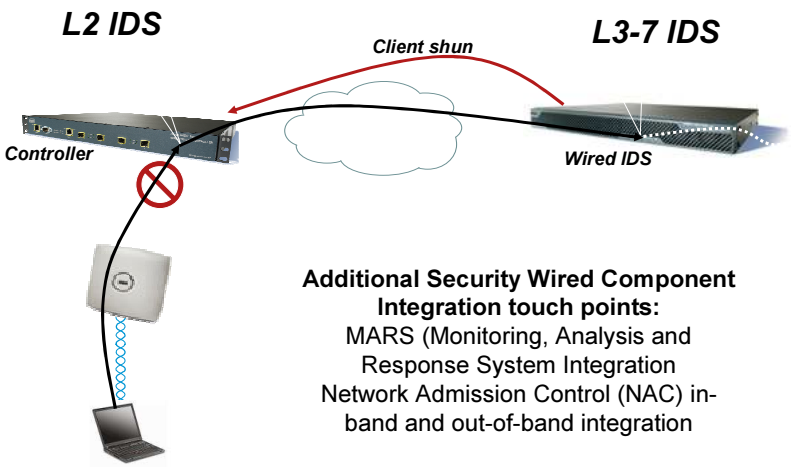
IPS Integration; Multi-layer IDS



Additional Security Wired Component Integration touch points:
MARS (Monitoring, Analysis and Response System Integration
Network Admission Control (NAC) in-band and out-of-band integration

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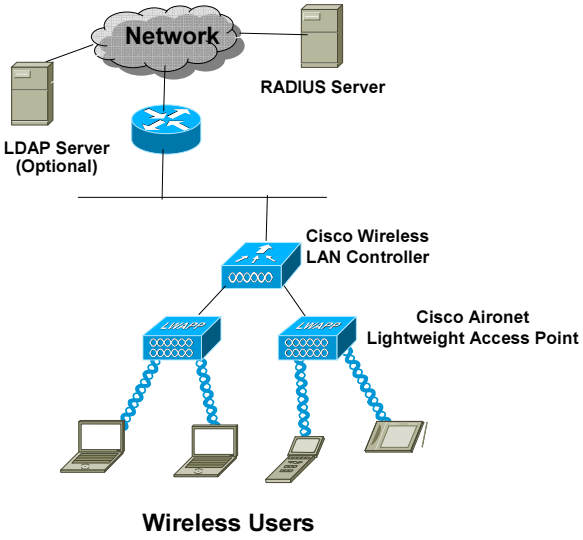
Authentication Methods



- All 802.1x methods supported
- Terminate EAP on Controller for 802.11i, WPA, and WPA2 authentication
- Direct LDAP Server Integration
- Radius Server Integration
- Define Users on Controller or in an LDAP Database (e.g. Active Directory)
- If the central RADIUS server is un-reachable, Local EAP can be used to authenticate users
- Simplified RADIUS server configuration – only controller configured versus all APs

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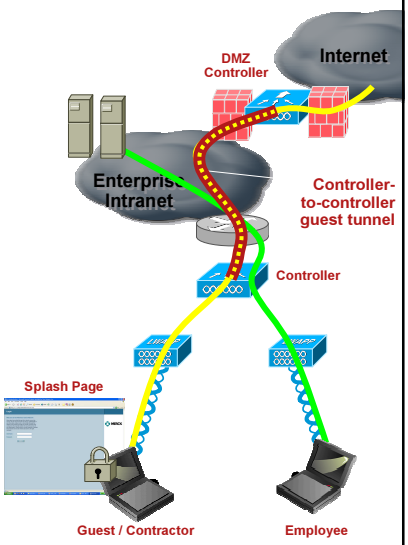
Guest Services – Path Isolation

- Additional level of security
  - –Guest traffic never mixes with enterprise traffic
- Controller-to-controller tunnel directs all guest traffic outside the firewall
- Guest controller applies policies to guests
- Internal corporate controller manages employee traffic
- Guest and Employee traffic is never on the same path



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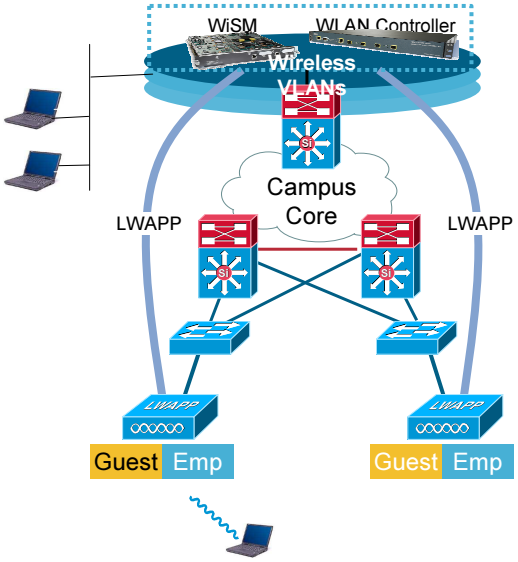
Unified Wired and Wireless Guest Access



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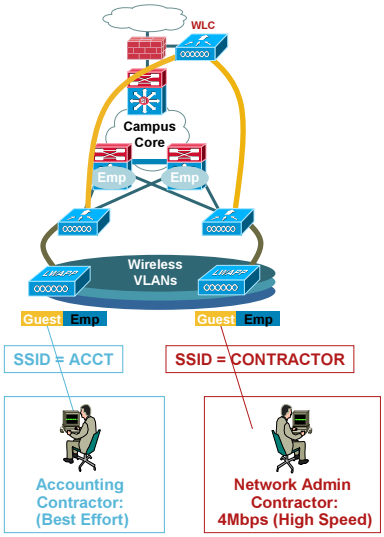
Guest Network Bandwidth Contracts



- Specify bandwidth limitations and policies by individual user or group
- Ability to allocate resources by specific job function or throughput requirements
- Organization's overall network performance is enhanced
- Increased granularity and control improves network security

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Client Validation and Posture Assessment

Business Challenge

Identify who is on the network and enforce granular policies to prevent exposure to viruses and "malware"

- Ensures wireless client is 'up-to-date' with latest security policies
- Quarantines & fixes any wireless client that is non-compliant
- Stops spread of viruses from uncontrolled wireless networks
- Products:
  - –NAC Appliance
  - –WLAN Controller

Authenticate & Authorize

- Enforces authorization policies and privileges

Scan & Evaluate

- Agent & network scan for required versions & infections

Quarantine & Enforce

- Isolate non-compliant devices from rest of network

Update & Remediate

- Network-based tools for remediation of threats & vulnerabilities

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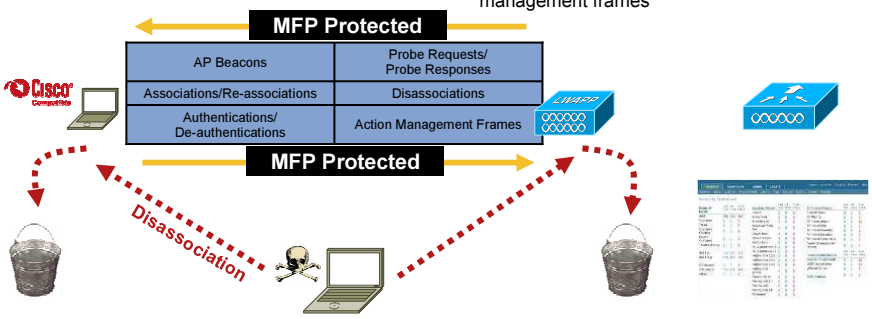
Management Frame Protection (802.11w)

Problem

- Wireless management frames are not authenticated, encrypted, or signed
- A common vector for exploits

Solution

- Insert a signature (Message Integrity Code/MIC) into the management frames
- Clients and APs use MIC to validate authenticity of management frame
- APs can instantly identify rogue/exploited management frames



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Additional Security Features

- DHCP Protection – proxy dhcp requests to protection against DHCP starvation attacks
- ARP Protection – protect against ARP spoofing attacks
- Peer to Peer blocking – not allowing users on the same SSID to be able to communicate with each other unless explictly allowed

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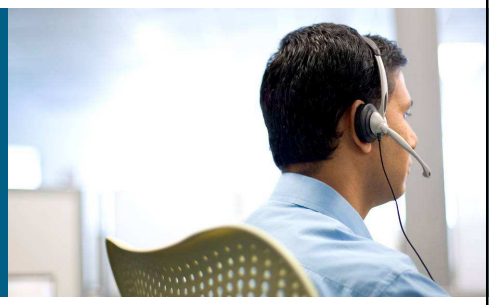
Cisco Mobility Services Engine



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Business Mobility Must Be Easier to Implement and Manage

Tremendous Challenge to IT Staff

Applications, Control and Compliance:

- Single Number and Voicemail
- Unified Communications
- Inventory Management
- Asset Tracking
- PCI
- HIPAA
- SOX

Disparate Networks to Operate/Manage:

- Wireless LAN
- Cellular/WiMAX
- Ethernet

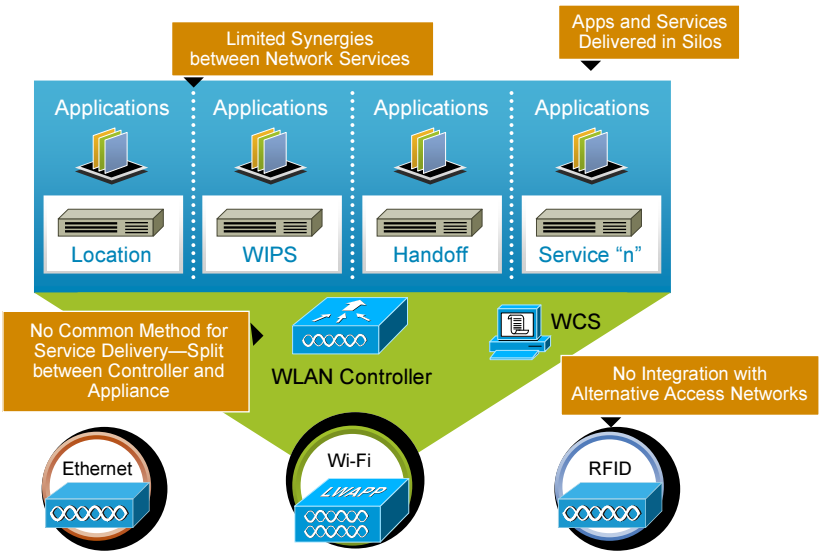
Lack of Device Profile Consistency:

- Dual Mode Phones
- Wired Phones
- Wireless IP Phones
- Laptops/Ultramobile PCs
- Ruggedized RFID Tags

80%+ of IT Mobility Resources: Reactive Client Management and Provisioning*

* Gartner Group

Existing Wi-Fi Networks



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Introducing A Practical Approach
Centralized, Scalable Mobility Services

3300 Series Mobility Services Engine

Services and Applications Platform
- Unified API enabling Enterprise 3.0 applications

Common Framework for Multiple Services
- Ease of deployment and efficient allocation of CapEx

Abstraction layer with CAPWAP/NMSP
- Allows Transport and Applications to evolve independently

Eco-system of Application Partners
- Accelerate development and deployment of customized solutions

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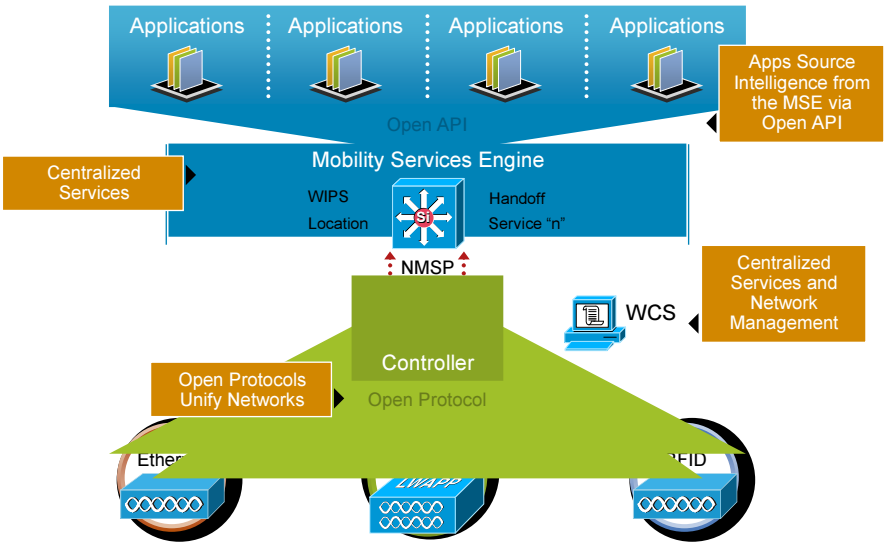
Mobility Services Networks



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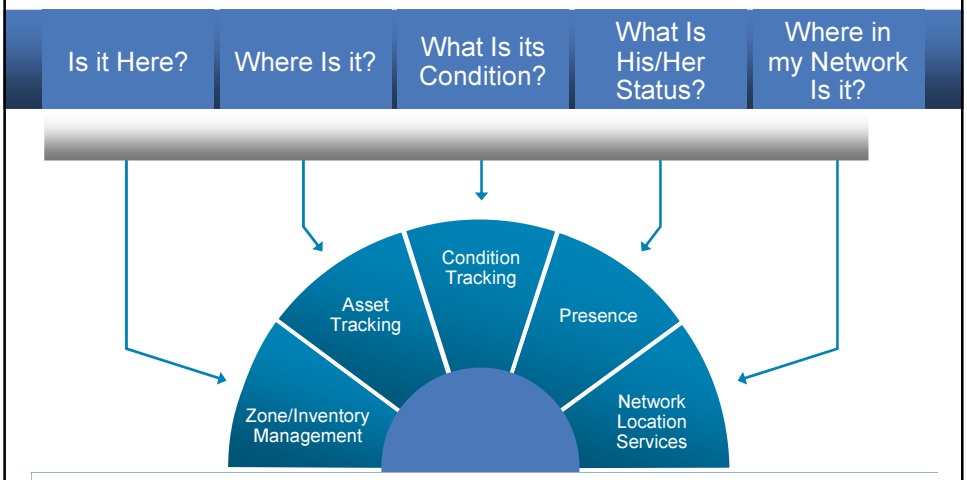
Mobility Services Engine Modules

Context Aware	Adaptive Wireless IPS	Secure Client Manager	Mobile Intelligent Roaming
Use contextual information such as location and telemetry to optimize business processes	Advanced intrusion prevention solution	Centralized device/client management and provisioning	Sustain mobility applications across public and private wireless networks
Wi-Fi Chokepoint, Sensoring, Passive RFID	Enhanced IDS Signatures, Reporting	Central Client Configuration and Provisioning Engine	Consistent Mobile Business Experience

Keeping Track of Your Assets in Motion



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Zone/Inventory Management Applications

Is It Here?	Where Is It?	What Is Its Condition?	What Is His/Her Status?	Where in My Network Is It?

Defining Zones and Tracking Mobile Assets Entering and Exiting

Education

- Classroom attendance
- Emergency evacuation

Asset Tracking Applications

Is It Here?	Where Is It?	What Is Its Condition?	What Is His/Her Status?	Where in My Network Is It?

Locating a Mobile Asset Anywhere in the Campus

Education

- Locating students when walking on campus

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Condition Tracking Applications

Is It Here?	Where Is It?	What Is Its Condition?	What Is His/Her Status?	Where in My Network Is It?

Measuring Temperature, Pressure, Humidity, Motion…

- Know the condition of certain rooms
- Know the temperature of the refrigerator

Presence Applications

Is It Here?	Where Is It?	What Is Its Condition?	What Is His/Her Status?	Where in My Network Is It?

Using Location Information to Automate Presence Status in Unified Communications Applications

- Automatically update status of staff to know if (classroom, playground…) and how to reach them (call, IM, email…)

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Cisco Context Aware Mobility Solution
How it works

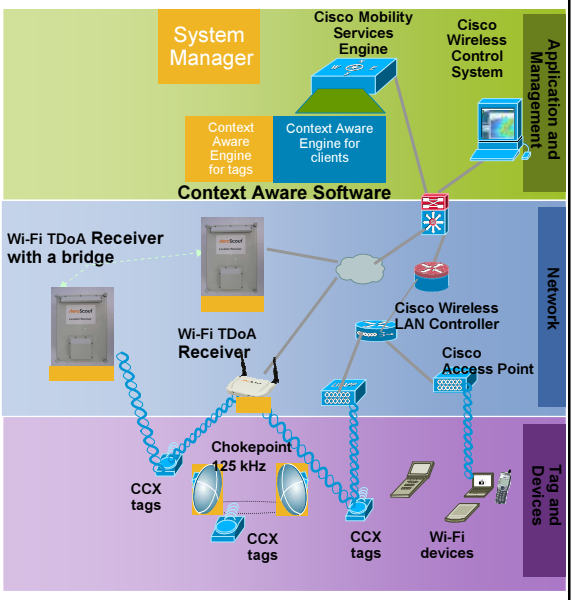
AeroScout

AeroScout HW on Cisco price list:
•Wi-Fi TDOA receivers
•Chokepoints

AeroScout SW on Cisco price list:
•Context Aware Engine for Tags

Both AeroScout SW and HW Are managed by AeroScout System Manager – Free client SW provided by Aeroscout

Items not on Cisco Price List
•Tags
•MobileView



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Cisco Context Aware Mobility Solution
Why moving from 2710 to MSE

Cisco 2700 Series Wireless Location Appliance

- Indoor only
- 2,500 tags and clients
- RSSI only
- Industry's 1st Location Solution Integrated into the WLAN infrastructure
- Mainly position for location
- Open API
- WCS Management

Cisco 3300 Series Mobility Services Engine

Beta customers: Boeing, Goodyear, IBM Dublin UC San Diego, U. Connecticut

- Indoor, **Outdoor, High ceilings**
- **18,000** tags and clients
- RSSI and **TDOA**
- Mainly position for **context aware**
- Open API
- WCS Management
- **Robust architecture for adding other technologies (UWB, Passive)**
- **Shared platform for other mobility services (incl. future)**

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Cisco Adaptive Wireless IPS

Major Extensions to Full-Time "Monitor-Mode" AP wIPS Solution

Expanded Detection

- 6x increase in attack detection capabilities
- Detection for "unknown" or "Day Zero" attacks

Ease of Use

- Threat encyclopedia and planning tools
- Attack explanations & step-by-step mitigation strategies

Analysis/Reporting

- Event forensics
- On-board security event archive & reporting

On-Going Protection

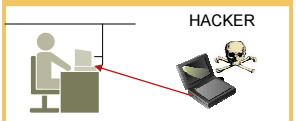
- Continually updated wireless threat detection for new attacks
- Dedicated threat research and detection development team

Wireless Security Threats

Top Attacks

On-Wire Attacks

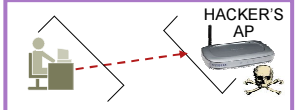
Ad-hoc Wireless Bridge



Client-to-client backdoor access

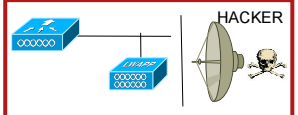
Over-the-Air Attacks

Evil Twin/Honeypot AP



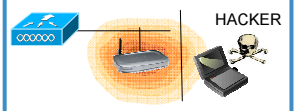
Connection to malicious AP

Reconnaissance



Seeking network vulnerabilities

Rogue Access Points

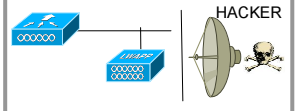


Backdoor network access

Denial of Service

Service disruption

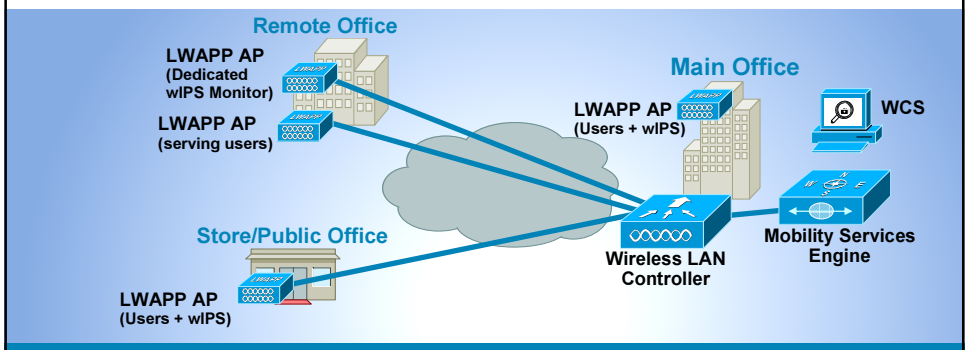
Cracking Tools



Sniffing and eavesdropping

Non-802.11 Attacks

Cisco Adaptive Wireless IPS
Architecture & Components

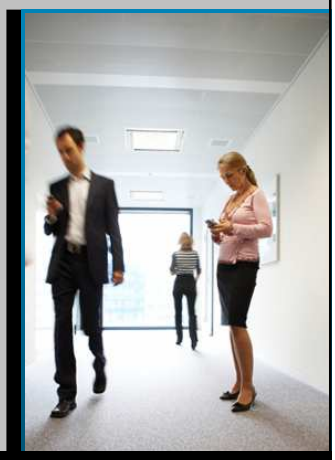


- **Shared or Dedicated LWAPP APs for wIPS monitoring**
- **Wireless LAN Controllers to serve APs performing wIPS**
- **WCS for management and reporting**
- ***New "extended" WIPS features require:***
  - **Dedicated "monitor-mode" APs**
  - **Mobility Services Engine + wIPS license for wIPS processing**
    - **Analysis, forensics and event storage of wIPS events from monitor APs**

Cisco Mobile Intelligent Roaming

Mobile Intelligent Roaming

- A Cisco Mobility Solution delivered through the Cisco Mobile Intelligent Roaming Software running on Cisco 3300 Series Mobility Services Engine
- Dynamically determines handoff requirements for dual mode devices based on wireless network visibility
- Leverages network intelligence and client software integration with an open eco-system of partners to initiate seamless handoff and improved user experience



Seamless Intelligent Handoff Enables a Transparent Mobile Experience

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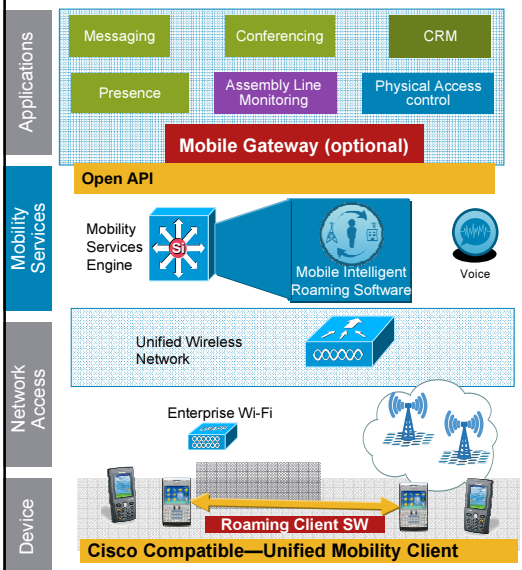
Mobile Intelligent Roaming Solution Overview



- Enterprise-grade notification that can be sent to a Mobile Gateway or to a Roaming Client from various partners for a network assisted intelligent roaming
- Cisco Partners could be
  - Service Providers lacking Enterprise Network Visibility
  - Device Manufacturers willing to increase the dual-mode phone users' experience
  - 3rd party vendors mobilizing enterprise unified communications

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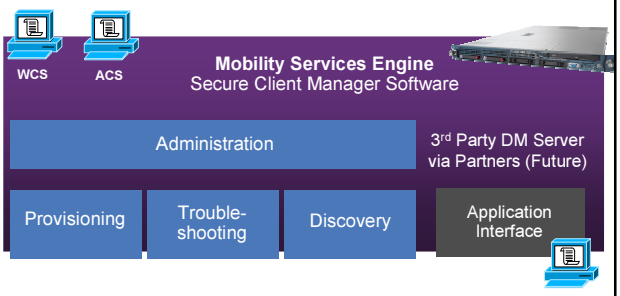
Secure Client Manager Solution Overview

- **Compliment existing software/device management systems (Altiris, SMS, IBM Tivoli, OMA-DM, etc.)**
- **Augment Cisco or 3rd Party end-to-end management framework**



Target solution gaps by providing management tool for 802.1X capable devices:

- **Inventory/device classification**
- **Bootstrap authorization**
- **Credential provisioning**
- **Packaging for distribution of Unified Client components**
- **Unified client log collection and parsing**
- **Unified client license management**

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Mesh (Indoor/Outdoor)

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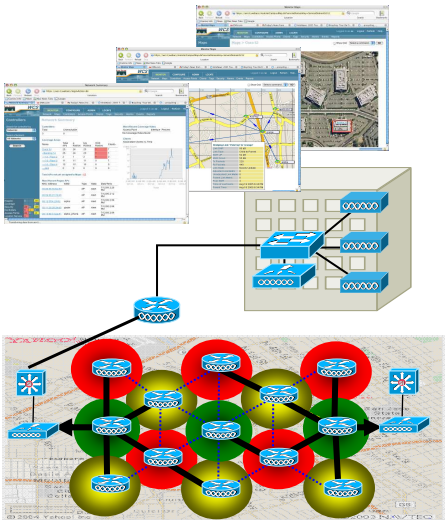
Wireless Without Boundaries Indoors and Outdoors



- Self-Configuring, Self-Healing Mesh
  - Zero-Touch Configuration
  - Cisco's new Adaptive Wireless Path (AWP) Protocol
- Identical Indoor & Outdoor Policy Management
- Dynamic & Reliable
- Easy to Deploy and Manage
- Robust Embedded Security
- Provides Seamless Mobility
- Operates over L2 or L3 Network
- Highly Scalable

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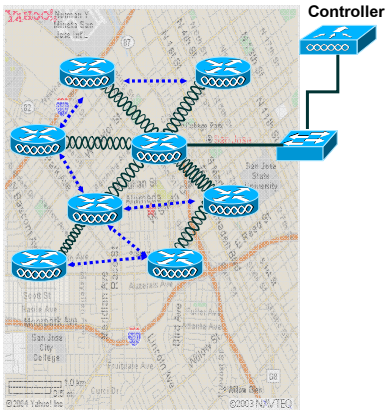
Dynamic, Intelligent Path Selection



- Adaptive Wireless Path (AWP) Protocol
  - 25 yrs of Cisco routing knowledge + 20 yrs of building RF networks
- AWP establishes an optimal path to Root
- Each AP carries feasible successor(s) if topology or link health changes
  - Note: AWP uses a "parent sticky" value to mitigate route flaps

Reliable *Self-configuring, Self-healing, Dynamic Path Optimization*

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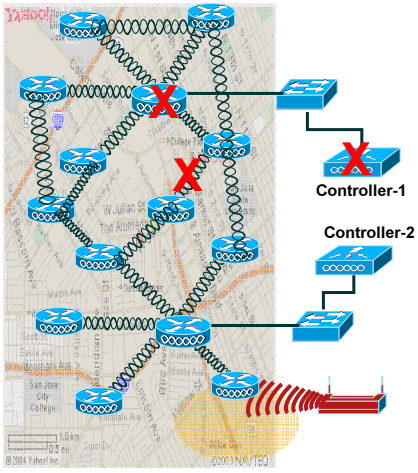
Self-Healing Mesh Networks



- Automatic Service load-balancing across Wireless LAN Controllers
  - LWAPP communicates controller load to APs
- APs learn secondary and tertiary Wireless LAN Controllers at "Network Join"
- Channel re-assignment in event of Channel conflict
- Connection to Alternate Controller

Reliable *Delivering Mission-Critical WiFi Access*

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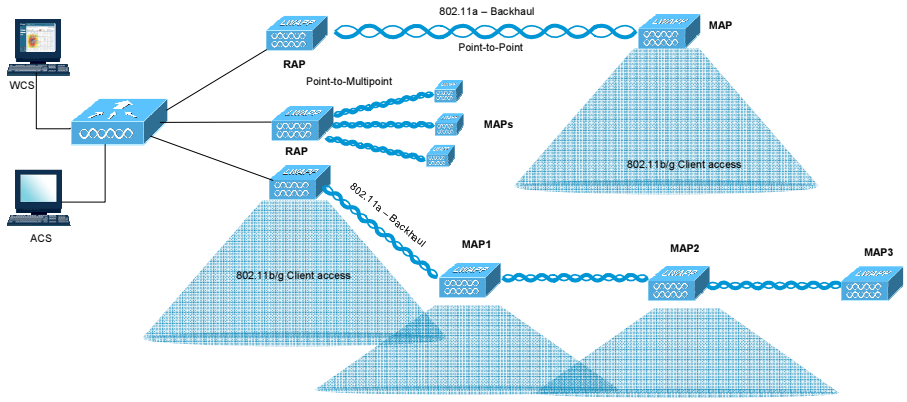
Enterprise Wireless Mesh (Indoor Mesh)

- 802.11a – Backhaul, 802.11b/g – Client access
- Point-to-Point, Point-to-Multipoint, Multihop bridging (supported 3hops)



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Cisco Video Surveillance IP Cameras

- High-Resolution, Video Surveillance IP Cameras

Resolution, Features, Network/storage Flexibility

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