Location, RFID, VoWiFi Commercial Mexico WEBINAR

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SE commercial
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What is RF Fingerprinting?

- **Closest AP**: Identify AP with strongest RSSI. Limited accuracy: an AP can easily cover several thousand feet.

- **RF Triangulation**: All APs identify the strength with which they hear a client. Intelligent algorithms triangulate responses to find probable location. More accurate than closest AP. But does not account for effect of building material and people on signal e.g. multi-path, attenuation, reflection...

- **RF Fingerprinting**: RF prediction creates a grid that identifies how every single part of the floorplan looks to all APs. Real world information is gathered by APs is compared to these fingerprints to determine location to within a few meters.

Learn more by reading:
Wi-Fi Based Real-Time Location Tracking: Solutions and Technology White Paper
## Cisco Location Tracking Options

### Cisco WCS with Location + Cisco Wireless Location Appliance

**Features**
- Real-time tracking
- Up to 2500 clients simultaneously
- View and store location history
- RF fingerprinting for high accuracy (<10 meter 90% of time; <5 meter 50%)

**Benefits**
- Asset management
- Inventory management
- Network modeling & capacity planning
- Security
- Third party API, Free Cisco Location API

### Cisco WCS with Location

**Features**
- On demand tracking
- Single device
- RF fingerprinting for high accuracy (<10 meter 90% of time; <5 meter 50%)

**Benefits**
- Rogue location
- Device tracking
- Troubleshooting

### Cisco WCS Base

**Features**
- On demand tracking
- Single device
- “Closest AP” for basic approximation

**Benefits**
- Easily determine device proximity
- Understand WLAN association behavior
2700 Series Location Tracking

- Cisco Wireless Control System (WCS) with location tracks a single device (on demand)
- Cisco Wireless Location Appliance enables simultaneous real-time tracking of thousands of devices within Cisco WCS
  - API for partner integration
  - Location history
  - Scalable
  - Location-based alerts

2700 Series Wireless Location Appliance
Solution Positioning:
Passive RFID vs. Active RFID

**Passive RFID**
- Visibility: Chokepoint
- Low-cost tags (<$.5)
- Low range (several inches or feet)
- Disposable
- Poor read rates (80-90%)
- Reader looks for tags
- Standards: EPC Global, ISO for high frequency tags in progress.

**Active RFID/RTLS**
- Visibility: Presence & Real Time Tracking
- Higher-cost tags (range: $50-100)
- High range (several hundred feet)
- Reusable
- Battery-powered tags actively send signals
- Air Interfaces: ANSI 371 Proprietary, Wi-Fi

Ideal for tracking **small, low-value items** as they enter/exit open-loop supply chains

Ideal for **real-time tracking of high-value items** through closed-loop systems
Centralized Intuitive Management

Cisco WCS can manage multiple Cisco Wireless Location Appliances
Rapid and Flexible Deployment

- Easy to Deploy
- Out of the box RF models & predictive technology
- Template-based RF models
- Support for re-usable, custom RF calibration models
Rich Functionality and Intuitive GUI

- Hierarchical maps
- High value asset and user visibility
  - Wi-Fi Tags
  - Wi-Fi Devices
  - Rogue Devices
  - Rogue Access Points
- Location-based security and rich audit trail for historical location information
Location Tracking Over Time
Pre and Post Deployment Tools

- Planning Mode Tool
  - Recommendations for access point placement and density

- Location Readiness Assessment Tool
  - Determine if WLAN deployment will support location accuracy within specifications

- Location Inspector Tool
  - Determine location accuracy post-deployment
### At-A-Glance Location Views

![Cisco Wireless Control System](image_url)

**Clients**

<table>
<thead>
<tr>
<th>User</th>
<th>Vendor</th>
<th>IP Addr</th>
<th>MAC Addr</th>
<th>AP</th>
<th>Loc Server</th>
<th>Rogue</th>
<th>SSID</th>
<th>Associated</th>
<th>State</th>
<th>Authenticated</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;none&gt;</td>
<td>Unknown</td>
<td>0.0.0.0</td>
<td>00:02:8b:9e:29:0f</td>
<td>00:15:c7.a8:e1:70</td>
<td>loc2</td>
<td>Probing</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AMPR\x7f\x7f\x7f</td>
<td>Unknown</td>
<td>171.71.236.195</td>
<td>00:02:8b:de:5a:00</td>
<td>00:15:c7.a9:8c:90</td>
<td>loc2</td>
<td>Associated</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;none&gt;</td>
<td>Unknown</td>
<td>02:8b:de:66:b6</td>
<td>00:15:c7.a9:8c:90</td>
<td>loc2</td>
<td>Probing</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;none&gt;</td>
<td>Unknown</td>
<td>05:4e:5f:65:53</td>
<td>00:15:c7.a9:8c:90</td>
<td>loc2</td>
<td>Probing</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;none&gt;</td>
<td>Unknown</td>
<td>08:a5:69:f9:5b</td>
<td>00:15:c7.a9:8c:90</td>
<td>loc2</td>
<td>Probing</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;none&gt;</td>
<td>Netgear</td>
<td>0.0.0.0</td>
<td>00:09:5b:a2:78:eb</td>
<td>00:15:c7.a9:8c:90</td>
<td>loc2</td>
<td>Probing</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;none&gt;</td>
<td>Netgear</td>
<td>0.0.0.0</td>
<td>00:09:5b:b4:25:62</td>
<td>00:15:c7.a9:8c:90</td>
<td>loc2</td>
<td>Probing</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>&lt;none&gt;</td>
<td>Unknown</td>
<td>0.0.0.0</td>
<td>00:0b:fe:fe:ef:be</td>
<td>00:15:c7.a9:8c:90</td>
<td>loc2</td>
<td>Probing</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>&lt;none&gt;</td>
<td>Unknown</td>
<td>128.10.7.23.15</td>
<td>00:0b:fd:76:40:23</td>
<td>00:15:c7.a9:8c:90</td>
<td>loc2</td>
<td>Associated</td>
<td>guestnet</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Network Map**

![Network Map](image_url)
Enabling 3rd Party Applications
Partnerships

Partner Value Chain

Silicon and Cisco Compatible Partners  →  Wi-Fi Tag Partners  →  Middleware and Applications  →  Channels and Systems Integrators  →  Cisco Inter-Business Unit Integrations

Markets

Retail  Transportation  Finance  Hospitality  Healthcare  Data Center  Education  Manufacturing
Enabling Third Party Location Applications

- Rich SOAP/XML API that can be licensed at no cost by 3rd Party Application Vendors & Systems Integrators

- Applications can import components that impact the air space for better location fidelity & real time changes e.g. network designs, APs, coverage areas as well as device/tag lists & location coordinates…

- Intelligent location based alerting & notifications can be defined in applications through area boundary definitions, allowed areas and distances

- Candidate applications could include: E911, asset management, ERP tools, workflow automation systems that can use location information

- Announcing PanGo Locator as an integrated partner application for workflow integration & customizable advanced asset management http://www.pangonetworks.com/locator.htm

- Works with Wi-Fi tags from partners
Wi-Fi Active RFID Tags

- **Interoperability:**
  - Interoperable with any standards based 802.11 tag
  - Proven interoperability with PanGo & Aeroscout tags

- **Battery life:**
  - 3-5 years, depends on beacon/blink rates
  - Unassociated tags promote battery life; intelligent motion detectors provide intelligent alerting only, preserving battery life

- **Security mechanisms:**
  - 802.11i/WPA2 & VLANs
  - Unassociated tags do not associate to network

- **Rich Device Information Relay:**
  - Serial telemetry information capable

- **Dimensions:**
  - Varies slightly by vendor but approximately
  - 2.44" (6.11) x 1.57 (4.14) x 0.67" (17mm) x 62mm (66.3) x 40mm (44.2) x 17mm (22.35)
  - Weight: 1.2oz (35g) - 2.5oz (w/batteries)

- **Various Mounting Options

- **Environmental Durability:**
  - Operating Temperature: varies by vendor: -30°C to +75°C (-22°F to 167°F) to 32 to 130°F (0 to 54°C)
  - Dirt/Dust/Water resistance, includes rubber lining IP-67, IP-68
Cisco and AeroScout offer integrated visibility solutions that use Cisco wireless networks to accurately locate assets and utilize location services to deliver direct benefits and improve business processes.

- Wi-Fi based active RFID tags
- Industry leading Cisco WLAN infrastructure
- Robust application platform
- Variety of location capabilities (indoors, outdoors, chokepoint)

Markets:
- Healthcare
- Manufacturing
- Logistics

Global Presence:
Over 200 customers in North America, APAC, EMEA, Latin America and ANZ

Customers:
- Boeing
- Bronson Hospital
- St. Luke’s Hospital
- Pratt & Whitney
- Weis Markets
- Holmgrens Automotive
- DHL
- Kyoto Municipal Child Safety
VoWiFi The Unified Mobile Workspace Unified Communications over WLAN
More Specifically, Mobility Is about Connecting People with Other People, Places and Things
Cisco Business Mobility Vision

Delivering Rich Business Experiences Securely
Anytime, Anywhere Across Any Network

Insight
Enabling Business Applications at the Point of Need

Collaboration
One Cisco Unified Communications Experience Anytime, Anywhere, Any Device

Awareness
Bridging the Physical World With the Enterprise

Intelligent Network Services Securely Extending the Value of Your Application and IT Investment

<table>
<thead>
<tr>
<th>WLAN</th>
<th>Mesh</th>
<th>Ethernet</th>
<th>WiMAX</th>
<th>Cellular</th>
</tr>
</thead>
</table>

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Cisco Seamless Mobile Collaboration

Fixed Mobile Convergence is the coming together of wireline and wireless technologies at three levels: networks, applications and devices.

Collaboration

Fixed Mobile Convergence as the coming together of wireline and wireless technologies

Networks

Applications

Devices

Fixed Mobile Convergence

WLAN

Ethernet

Cellular

WiMAX

Location

Presence

Directory

Presence

Single Number

Single VoiceMail
Unified Communications over WLAN is a subset of Fixed Mobile Convergence and includes dual-mode and Wi-Fi phones, the WLAN network and a variety of applications.

**Collaboration**

Unified Communications over WLAN is a subset of Fixed Mobile Convergence

- Location
- Presence
- Single Number
- Single VoiceMail

**Network Types**

- Ethernet
- WLAN
- Cellular
- WiMAX
UC over WLAN as Part of the Mobile Workspaces

Corridor Cruiser  Road Warrior  Campus Mobile

Wherever you are  Whatever you’re using

Teleworker  Field Force
# UC over WLAN Solution for Road Warrior

## Definition
- Mobile outside the office >80%
- Corporate office available
- Mainly email and phone

## Benefits

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Cisco Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved call success rate and responsiveness</td>
<td>Mobile Phone extension via SCCP or SIP client with Cisco Unified Communications Manager</td>
</tr>
<tr>
<td>Increased productivity and communications efficiency with visual voicemail, presence, integrated call logs</td>
<td>SCCP or SIP client with Cisco Unified Communications Manager</td>
</tr>
<tr>
<td>Least cost routing and reduced fixed to mobile costs</td>
<td>Dual mode phones</td>
</tr>
<tr>
<td>Increased in-building reachability through UC over WLAN</td>
<td>Cisco Unified Wireless Network</td>
</tr>
</tbody>
</table>
Corridor Cruiser

Definition
- Mobile within the office more than 20% of the time
- Travel infrequently, often to campus
- Phone, business applications and medium email
- Multiple devices
- Travel outside of campus 30%

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Cisco Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved call success rates and responsiveness through single number</td>
<td>Mobile Phone extension via SCCP or SIP client with Cisco Unified Communications</td>
</tr>
<tr>
<td>reach and single voicemail</td>
<td>Manager</td>
</tr>
<tr>
<td>Increased productivity and communications efficiency with visual voicemail, presence, integrated call logs</td>
<td>SSCP or SIP client with Cisco Unified Communications Manager</td>
</tr>
<tr>
<td>A rich collaboration experience when working from a laptop while on-the-go</td>
<td>Cisco Unified Personal Communicator</td>
</tr>
<tr>
<td>Increased in-building reachability through VoWLAN</td>
<td>Cisco Unified Wireless Network</td>
</tr>
<tr>
<td>Least cost routing and reduced fixed to mobile costs</td>
<td>Cisco Unified Wireless IP Phones and/or dual mode phones</td>
</tr>
</tbody>
</table>
## UC over WLAN Solution for Campus Mobile

### Definition
- Mobile within the campus more than 70% of the time
- Shared phone no desk
- Heavy phone or pager user, business applications
- Specialized devices (ruggedized, reader…)

### Benefits

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Cisco Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase job/task preformed and improve quality of work by minimizing multiple information touches or delayed data input</td>
<td>Mobile Phone extension via SCCP or SIP client with Cisco Unified Communications Manager</td>
</tr>
<tr>
<td>Increased in-building reachability through VoWLAN</td>
<td>Cisco Unified Wireless Network</td>
</tr>
<tr>
<td>Improved collaboration with support for partner Push to Talk applications</td>
<td>Cisco Unified Communications Manager and Cisco Unified Wireless IP Phones</td>
</tr>
<tr>
<td>Least cost routing and reduced fixed to mobile costs</td>
<td>Cisco Unified Wireless IP Phones</td>
</tr>
</tbody>
</table>
Main Components of UC over WLAN

- Devices
- Open and Modular
- Applications
- Network
Main Components of UC over WLAN

- Cisco Unified Communications Manager Express
- Cisco Unified Communications Manager
- Cisco Unified Communications 500 Series
- Communications Manager Bus Edition

**Functions**
Manage multi-media communications processing between end-points, UC applications and VoIP gateways.

**Voice Gateway**
IOS gateways supporting a variety of signaling and call control protocols for cross-network communications

**Messaging Gateway**
Open, secure, centralized & scalable platform to intelligently route voice messages within UC network

**Cisco Unified Presence**
Manage availability status, preferences, presence application development & integration
Main Components of UC over WLAN

Considerations when choosing UC network

- Ensure reachability and productivity benefits regardless of device, operating system, network, and application
- Prefer integrated services between fixed and mobile applications to deliver a rich collaboration experience
- Leverage embedded network services to meet compliance, scalability, security, reliability, and management requirements of the business
- Check for integration with wireless network and devices for QoS needs
Main Components of UC over WLAN

Cisco WLAN Controller

Hybrid Remote Edge Access Point

Cisco WLAN Controller

Cisco Aironet Access Points

Cisco Unified Wireless Network
Cisco Mobility Express

Cisco Wireless Control System

Functions

- Addition to Wi-Fi standard to accelerate innovation adoption
- Quality of Service starting at the device itself
  Metrics for monitoring and troubleshooting
- Roaming between access points
- Security with WPA2

Functions

- Voice readiness tool
- Troubleshooting
- Diagnostics
- Management
- Spectrum analysis

Functions

- RF capacity planning and optimization
- Across IP subnet, fast secure and dual band roaming
- Quality of Service over wireless and interfacing wired network
- Security with tunneling and encryption
Main Components of UC over WLAN

Considerations when choosing wireless network

- Check for support Quality of Service end-to-end i.e. supported on all the IT equipment on the path of the voice traffic
- Prefer solutions tested and validated with a large number of devices
- Favor fast and simple troubleshooting solutions to ensure satisfactory end-user experience
- Request for integration with your existing VoIP system
# Main Components of UC over WLAN Network Design Recommendations

<table>
<thead>
<tr>
<th>VLANs</th>
<th>Voice should be on a separate VLAN from data</th>
</tr>
</thead>
<tbody>
<tr>
<td>QoS</td>
<td>Need end-to-end QoS (clients, APs, Switches, Routers)</td>
</tr>
<tr>
<td>AP Coverage</td>
<td>VoWLAN phones, which are used while the user is in motion, can expose coverage “holes”</td>
</tr>
<tr>
<td>Interference</td>
<td>Voice apps won’t perform well if there is a lot of interference from Wi-Fi or non Wi-Fi devices, so a good spectrum analysis is important</td>
</tr>
<tr>
<td>Capacity</td>
<td>To handle voice and data traffic, more APs are needed, and uniform transmit power is preferable</td>
</tr>
<tr>
<td>802.11 a/b/g/n</td>
<td>802.11 a/b/g/n APs provide more speed, more bandwidth, more channels, more reliability and more predictability to handle demands of voice &amp; data applications</td>
</tr>
<tr>
<td>Cisco Compatible</td>
<td>Use Cisco Compatible certified devices for Fast handoff, Battery Savings and other benefits not covered by the Wi-Fi standard</td>
</tr>
</tbody>
</table>

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**White papers**

*Design Principles for a Voice-Ready Wireless Network*

*Is your WLAN ready for Voice?*
Main Components of UC over WLAN

Applications
- IP Communicator
  - Function: IP Phone like calling and video capabilities using soft-client on laptops
- Unified MeetingPlace Conferencing
  - Function: On-demand rich conferencing and collaboration with MeetingPlace and MeetingPlace Express
- Unified Personal Communicator
  - Function: Rich UC client that delivers integrated call control, presence, messaging, directory, and conferencing on PC or Mac based laptops
- Cisco Unity Messaging
  - Function: Ubiquitous on-campus access to Unity Express, Unity Connection, and Unity messaging applications
- Intellisync Call Connect for Cisco
  - Function: Makes dual-mode phone serve as mobile extension of Cisco IP Phone on-campus
Main Components of UC over WLAN

Considerations when choosing applications:

- Check that the application best suited to meet the mobility and unified communications needs of different mobile worker types is supported.
- Ensure that this application is optimized to deliver desired UC services to preferred or required mobile devices.
- Ensure that this application is optimized over the wireless network and VoIP system.
Main Components of UC over WLAN

---

**Devices**

<table>
<thead>
<tr>
<th>Devices</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wi-Fi Laptops</strong></td>
<td>• On-demand used for <strong>business applications</strong></td>
</tr>
<tr>
<td></td>
<td>• Can be enhanced with <strong>soft phones</strong></td>
</tr>
<tr>
<td></td>
<td>• <strong>Widely available</strong> with 802.11 a/b/g and now 802.11n</td>
</tr>
<tr>
<td></td>
<td>• <strong>Large</strong> screen and form factor</td>
</tr>
<tr>
<td></td>
<td>• Nomadic use</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Dual Mode Phones</strong></th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• For <strong>Cellular and WLAN coverage</strong></td>
</tr>
<tr>
<td></td>
<td>• <strong>Ruggedized</strong> version available for field workers</td>
</tr>
<tr>
<td></td>
<td>• <strong>Small</strong> screen and form factor</td>
</tr>
<tr>
<td></td>
<td>• Mainly used for <strong>emails</strong> and <strong>phone calls</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Wi-Fi Phones</strong></th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• For <strong>Ruggedized</strong> version available for field workers</td>
</tr>
<tr>
<td></td>
<td>• For <strong>on campus</strong> use (WLAN only)</td>
</tr>
<tr>
<td></td>
<td>• <strong>Small</strong> screen and form factor</td>
</tr>
<tr>
<td></td>
<td>• Mainly used for phone <strong>calls</strong></td>
</tr>
<tr>
<td></td>
<td>• Possibility to add simple applications on the device</td>
</tr>
</tbody>
</table>
Main Components of UC over WLAN

Considerations when choosing devices

- Determine Mobile Workspaces are present in the company and which applications should be made available on the go to whom
- Think about your device management strategy
- Check that enhanced with QoS, power savings and roaming features are present

WAN

Cisco Wireless Control System

Cisco WLAN Controller

Hybrid Remote Edge Access Point

Teleworker Office

Branch Office

Headquarters
Cisco Unified Personal Communicator

- Single, rich-media interface for PCs and Mac
- Access powerful productivity enhancing applications
- Leverage presence indicators
- Use video to exchange ideas “face-to-face”
- Escalate communication methods for more effective interactions
  - Voice, Video, IM, Web Conferencing
- Windows XP, Windows Vista, Mac OS X
Cisco Unified IP Communicator

- Full features and functionality of a desktop Cisco IP Phone
  - Direct access to voicemail
  - Multiple line appearances
    - Supports XML-based applications on the display
- Video communications with Cisco Unified Video Advantage for Video
- Microsoft Windows 2000 and XP Professional, Vista Business and Enterprise editions
Cisco Unified Wireless IP Phone 7921G

- Wireless IP Phone increases productivity by increasing reach-ability
- Reduce costs by utilizing a single converged network
- Easy-to-use wireless IP phone (802.11a/b/g)
- 2” Color display and intuitive access to features
- Dedicated key that can support PTT XML applications
- Improved battery life (1.04)
  - Talk time: from 12 hrs to 15.5 hrs
  - Standby time: from 80 hrs - 150 hrs
- Multi-Charger (est. fcs October)
Cisco Mobility Express Solution
An SMB Solution That Evolves with You

Integration
- Part of the Smart Business Communications System

Flexible Cost
- Pay as you grow
  - Hardware
  - Software
  - Advanced mobility services

Business-grade features
- Reliability built-in
- Security
- Scalability
- Advanced mobility services

Cisco Mobility Express Solution
Application-Based
Access points, controllers, plus application servers

Controller-Based
Access points plus controllers

Standalone
Access points

Adapt to Your Level of Sophistication
Grow with Your Business
Offer a Mobile Foundation for All
Cisco Certified Dual Mode Devices

**RIM Blackberry 8820**
- Dual mode device delivers always on in-building reachability for e-mail and applications
- 802.11a/b/g, GPS, GSM/EDGE
- Enterprise-class security with WPA2
- Cisco CCXv3 Certification with Cisco Unified Wireless Network

**Intermec CN3 Ruggedized PDA**
- Ruggedized dual mode computer with voice and data over the WLAN in-building
- Integrated 802.11b/g, GPS, GSM/EDGE or CDMA
- Enterprise-class security with WPA2
- Cisco CCXv4 Certification with Cisco Unified Wireless Network
- Voice over WLAN certified with Cisco Unified Communications Manager (Nov 07)

**HP iPaq 600**
- Dual mode 3G phone with voice and data over the WLAN in-building
- 802.11b/g, GSM/EDGE, GPS
- Enterprise-class security with WPA2
- Cisco CCXv4 Certification with Cisco Unified Wireless Network (Dec 07)
- Voice over WLAN certified with Cisco Unified Communications Manager (Nov 07)
Cisco Fast Secure Roaming

- Compatible with WPA2 and supported for Cisco Compatible Extensions clients and Cisco 7921 Wireless IP Phone
- Enhanced Neighborhood List to exchange information with AP nearby (RF parameters, authentication, measurement) and fasten roaming

Benefits:
- Increased security including Voice traffic
- Transparent roaming for end-user
- Optimized capacity utilization at the network level
Spectrum Analysis

Other Devices:
2.4/5 GHz Products that Interfere

SpectrumRF Interference Kills Voice Over Wi-Fi Reliability
- Reduces voice quality
  Transmit delays & collisions
  Results in Jitter
- Reduces voice capacity
  Interference air-time causes Reduced channel capacity
- Reduces voice coverage
  Interference reduces SNR
  Results in Cold spots

Spectrum Intelligence is the Solution
- Pro-actively monitor for RF interference Before reported by users
- Identify and eliminate interference sources
  Enforce spectrum policy
- Mitigate impact of devices that must stay
  Network tuning & Shielding

Other Devices:
2.4/5 GHz Products that Interfere

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Access Points Optimized for Voice

- Call Control Admission at the access point level
  - Ensures QoS is maintained when network congestion occurs
  - Prioritizes calls in progress over new requests for calls
  - Triggers dynamic load balancing across multiple AP’s to ensure high availability
- Minimum retries and fast rate-shifting algorithm
  - For a faster delivery of short voice packets
- Intelligent packet-discard algorithms
  - To reduce retransmission and delay

**Benefits**
- Increased number of calls per AP
- Improved network availability and audio quality during peak utilization
- Enhanced end-user experience in a consistent manner
Power Save for Longer Battery Life

Legacy Power Save

WMM Power Save

Wireless CCX V4 Voice Client

- Allows send/receive in one operation to minimize battery drain
- Available in CCX Version 4 Clients

Cisco Unified Voice Ready Wireless Network

Benefits

- Increased number of calls per AP
- Double talk time to be on par with cellular
- Reduce inventory cost
- Enhanced end-user satisfaction and fasten adoption
UC over WLAN—Applications & Benefits

**Healthcare**
- Clinical staff can maintain communication at bedside
- Improve workflow by eliminating page and wait

**Retail**
- Quickly respond to customer queries and sales managers
- Strengthen employee interaction and communication

**Hospitality Services**
- Improve customer services and sales
- Maintain critical communications from anywhere in facility

**Manufacturing**
- Check on status and events, quickly resolving problems
- Accelerate decision making through real time communications

VOICE READY WLAN