Voice over Wireless

Enabling Seamless Mobile Collaboration:

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What is in Your Mobile Workspace?

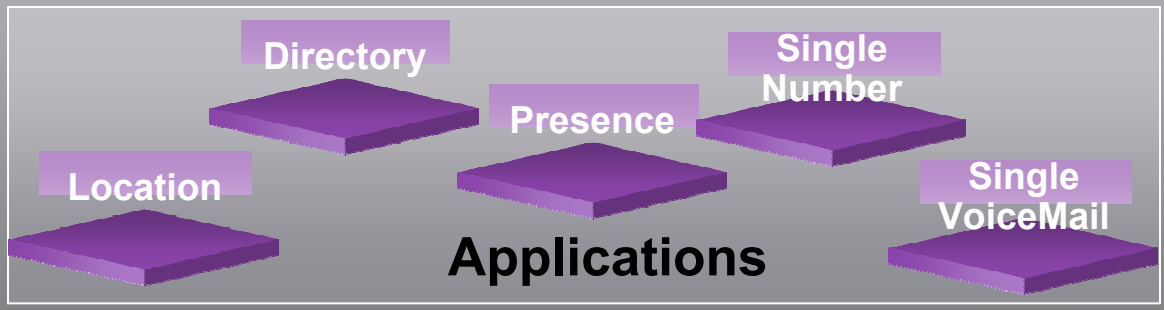
Mobile Workspaces contain any combination of locations, networks, devices, applications and operating systems

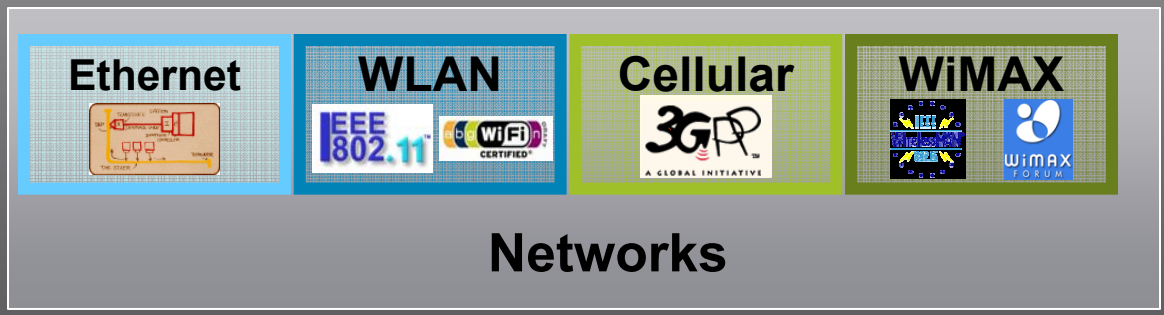
Cisco Seamless Mobile Collaboration

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

Collaboration

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



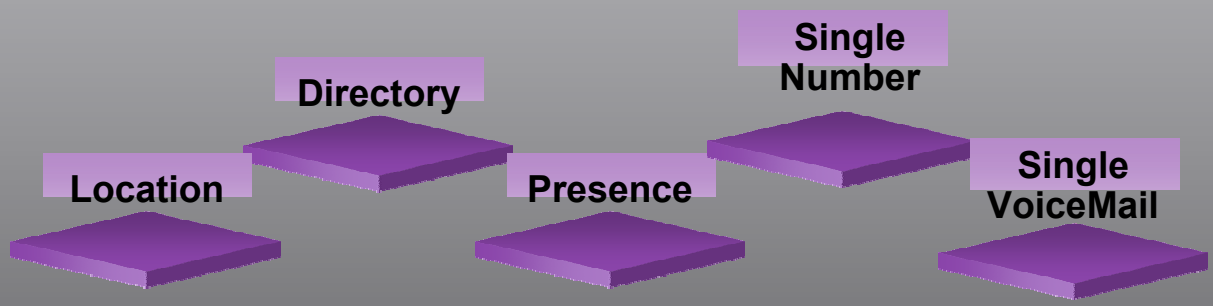


Cisco Unified Communications over WLAN

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



Ethernet

WLAN

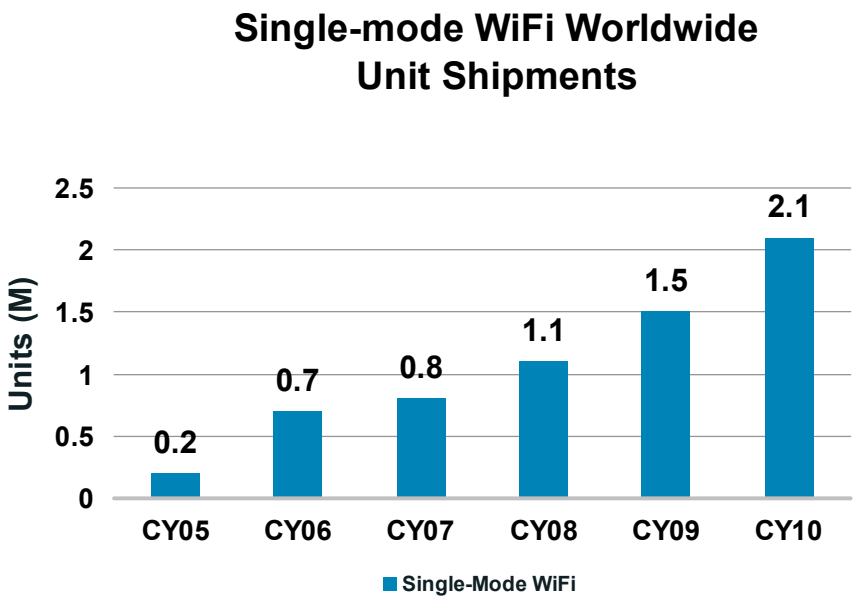
Cellular

WiMAX

Worldwide Shipments of WiFi Enabled Phones

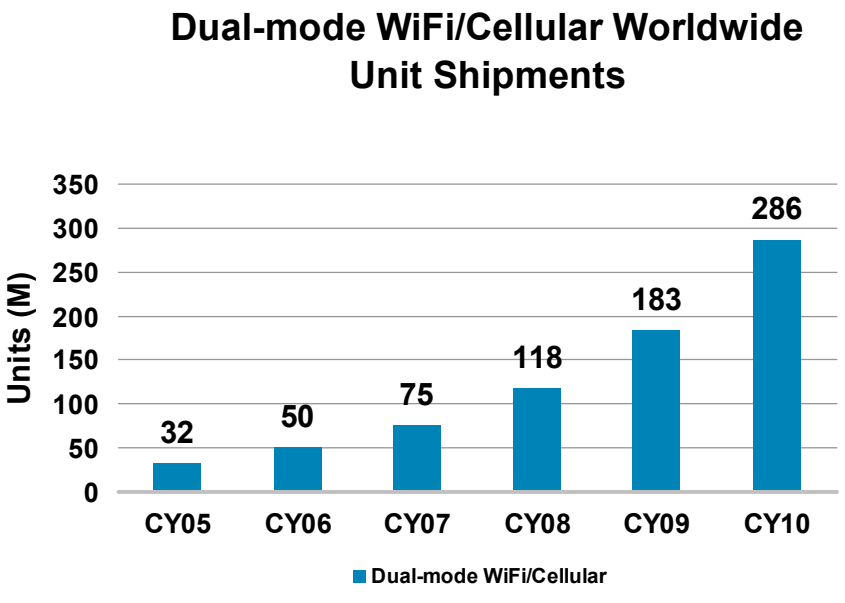
Single-mode

- Single-mode phone shipments expected to grow
- Vertical market focus



Dual-mode

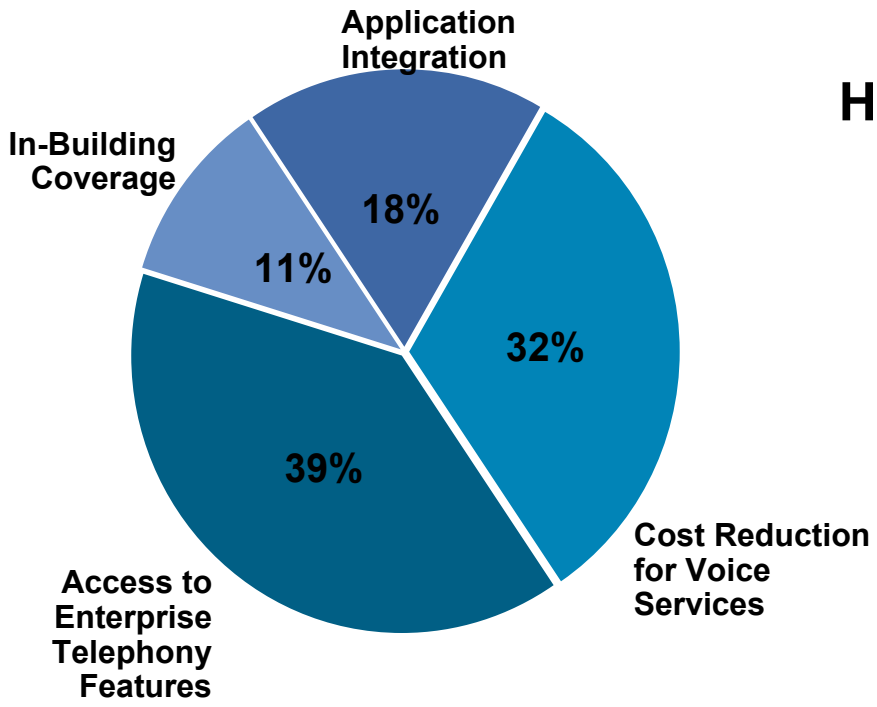
- 286M Dual-mode phones expected to ship in CY10
- Mainstream Enterprise focus



Mobility TV - FMC Webinar Audience Poll

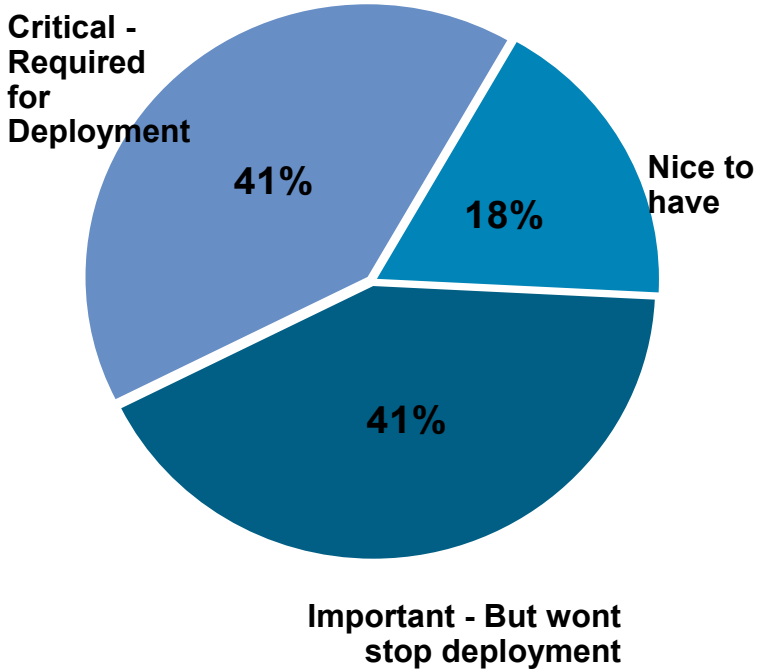
Drivers for Adoption of Dual-mode

84 Responses



How important is Seamless Handoff

108 Responses



VoWLAN Client Devices

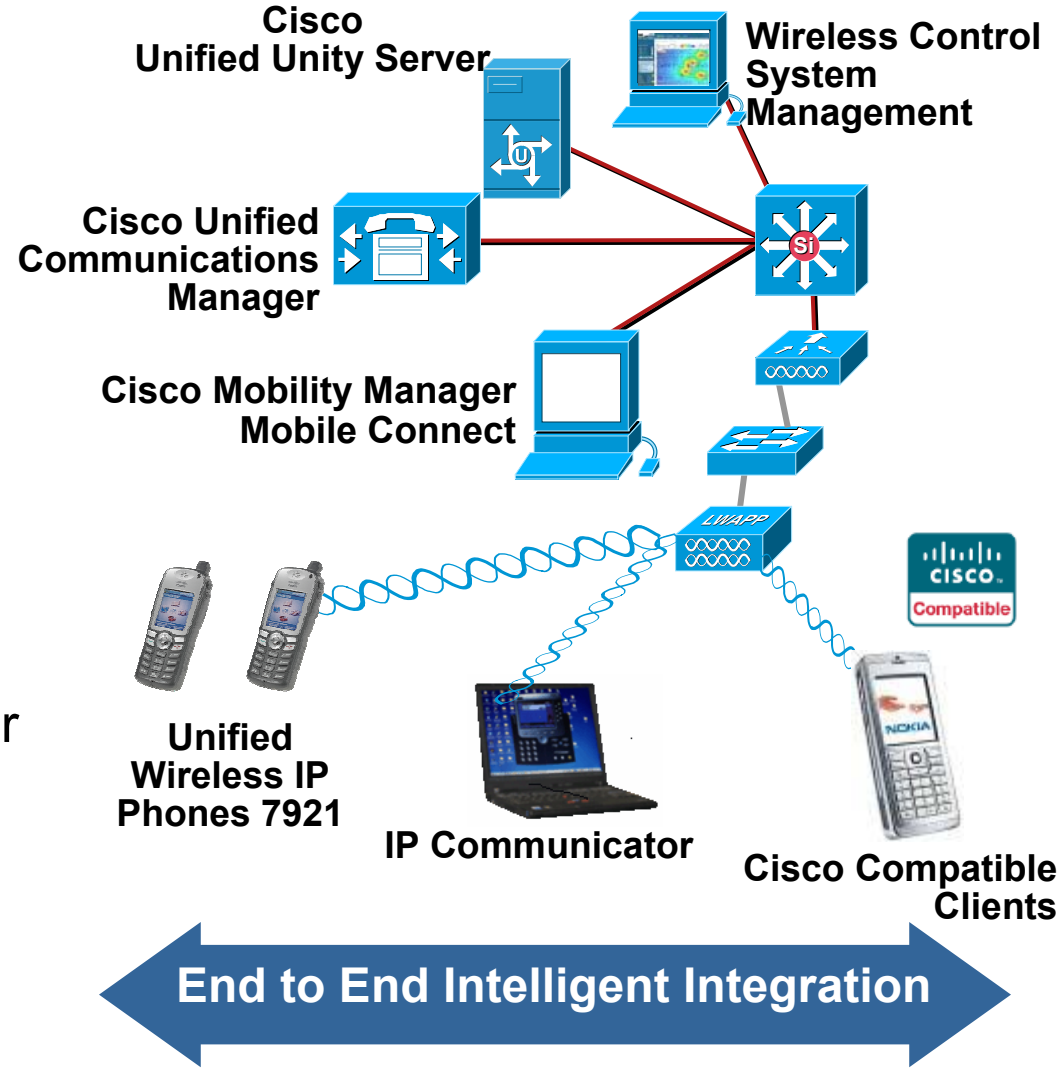
Applications

WLAN Features

Usage Model

Cisco Unified Wireless Network Voice Services Solution

- Seamless mobile voice communications across the enterprise
- Only end-to-end unified wireline and wireless voice solution
- Rich selection of enterprise-class and industry specific voice clients
- Increased call capacity, higher network availability and improved performance



VoWLAN Cost Drivers

- An integrated wired and wireless LAN can minimize total cost of ownership

Strategies to Minimize TCO

- Strategic
  - Managed services
  - Design for voice
- Tactical
  - Upfront deployment
  - Leverage tools to manage RF environment
  - Use softphone on existing clients when possible

Voice over WLAN
How to Justify

Employee Productivity

- Reduced call backs, fewer call attempts
- Single mailbox, fewer duplicate messages
- Flexibility: choice of device and location for calls

Customer Satisfaction

- Increases speed of response
- Flexible communication flow with media choices
- Personalized service

OPEX Reductions

- Predictable/controllable cellular expenses
- Least cost routing/Intelligent on corporate network
- Better visibility, better control

Improving Productivity: The Road Warrior Example

Ubiquitous Access to Phone, E-mail, Fax and Voicemail with Unified Messaging and Soft Phone

- Immediate response from 35,000 ft.
- Reduced access complexity through "one-stop" mailbox
- Intelligent routing and prioritization of messages
- Extension portability and "follow me" capabilities

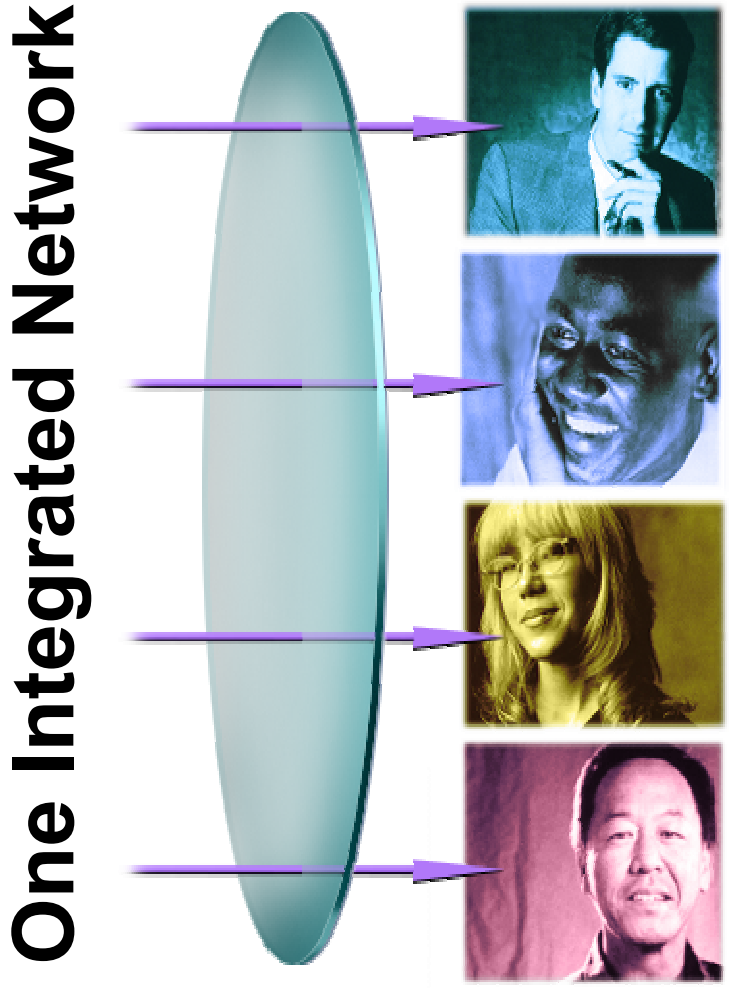
Lufthansa

Why Wi-Fi Phone?

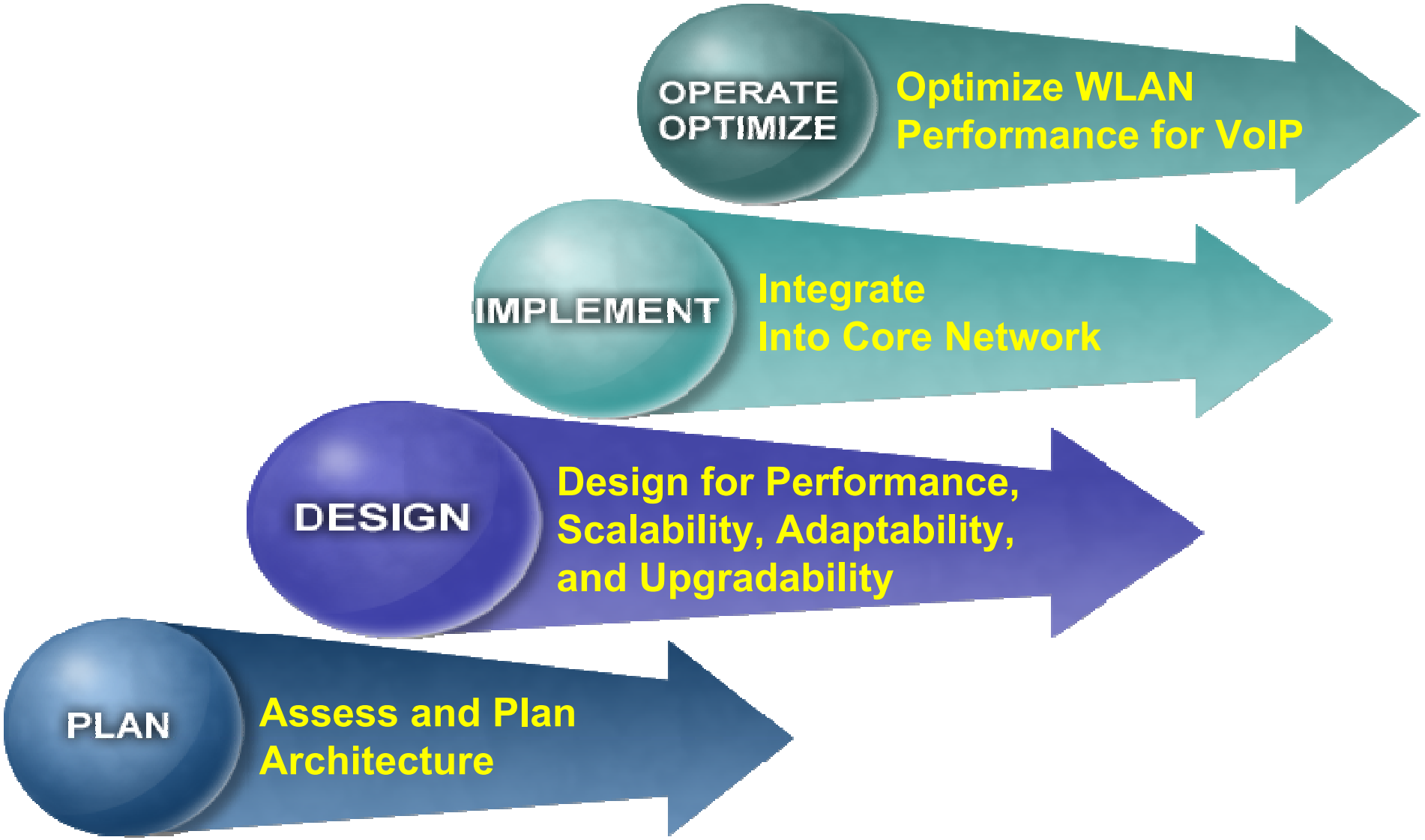
	VoWLAN (C7921)	Radio (Walkie-Talkie)	DECT	Cellular	Dual-mode
Toll	Free	Free	Free	Yes	Free
Voice Quality	Excellent (G.722, 80kbps)	Under moderate	moderate (G.726 32kbps)	moderate (5.6 kb, 13kb,12.2kb)	moderate
Coverage	Small	Large	Medium	Large	Small or Large
Application integrated SMS	Native Support	No	Expensive	Expensive	Yes
Security	Excellent (AES)	No	moderate (DES)	moderate	Excellent
PTT	Yes	Yes	No	No	No
IP-PBX Integration	Yes	Limited (ex. IPICS)	No	No	Yes

Are Wireless LAN's Ready for Voice?

- Security
- QoS
- Roaming
- Management

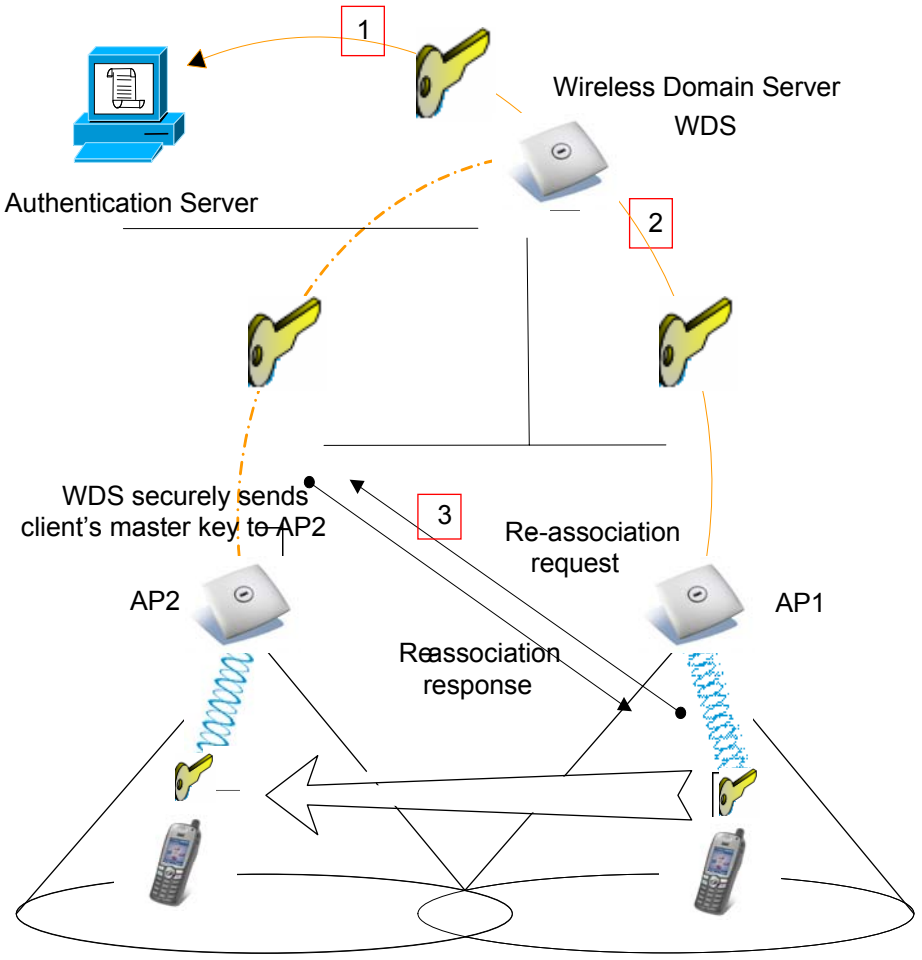


Does It Make Sense to Deploy Products Now?



Fast Secure Roaming with CCKM

- WDS server is the authenticator for the subnet
- AP1 and AP2 authenticates with WDS
- WDS caches the client's security credentials
- At association, AP1 gets the key materials to derive dynamic keys for session
- At re-association, AP2 gets the key materials to derive dynamic keys for session
- Client authenticates with radius server only once.



1 Client authenticates with authentication server

2 Master key is cached on the WDS and sent to the AP where it is used to derive a session key for AP

3 Client roams to AP2 and new keys are generated

Dynamic Transmit Power Control (DTPC)

- Set the same transmit power on the AP and on the phones

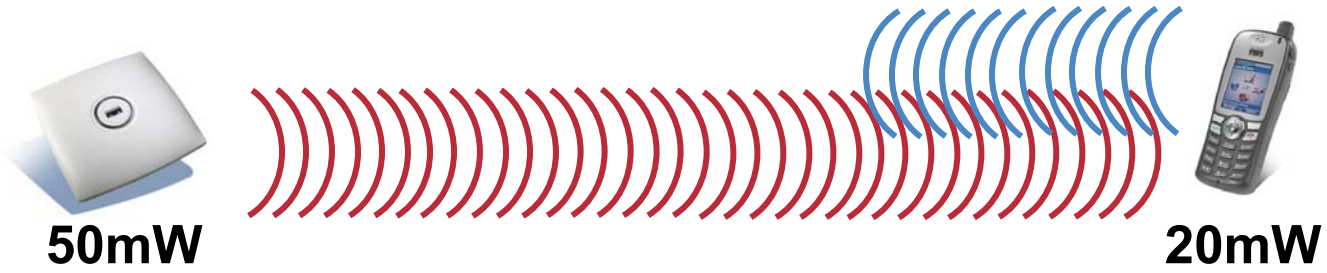
  If using an AP that supports DTPC, then ensure client power matches the local AP power

  (Do not use default setting of Max power)

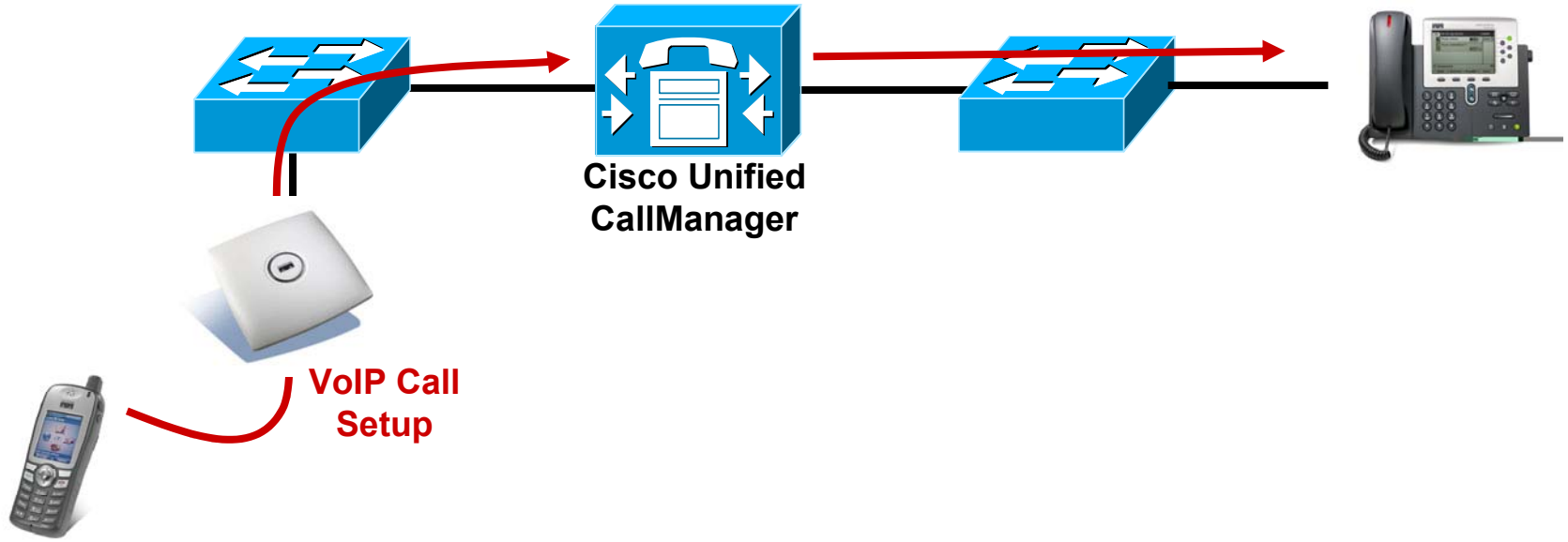
  If the AP does not support DTPC, then need to statically set the phone's transmit power to match the AP with the highest transmit power in the WLAN

- Prevents one-way audio

  i.e. RF traffic is only being heard in one direction

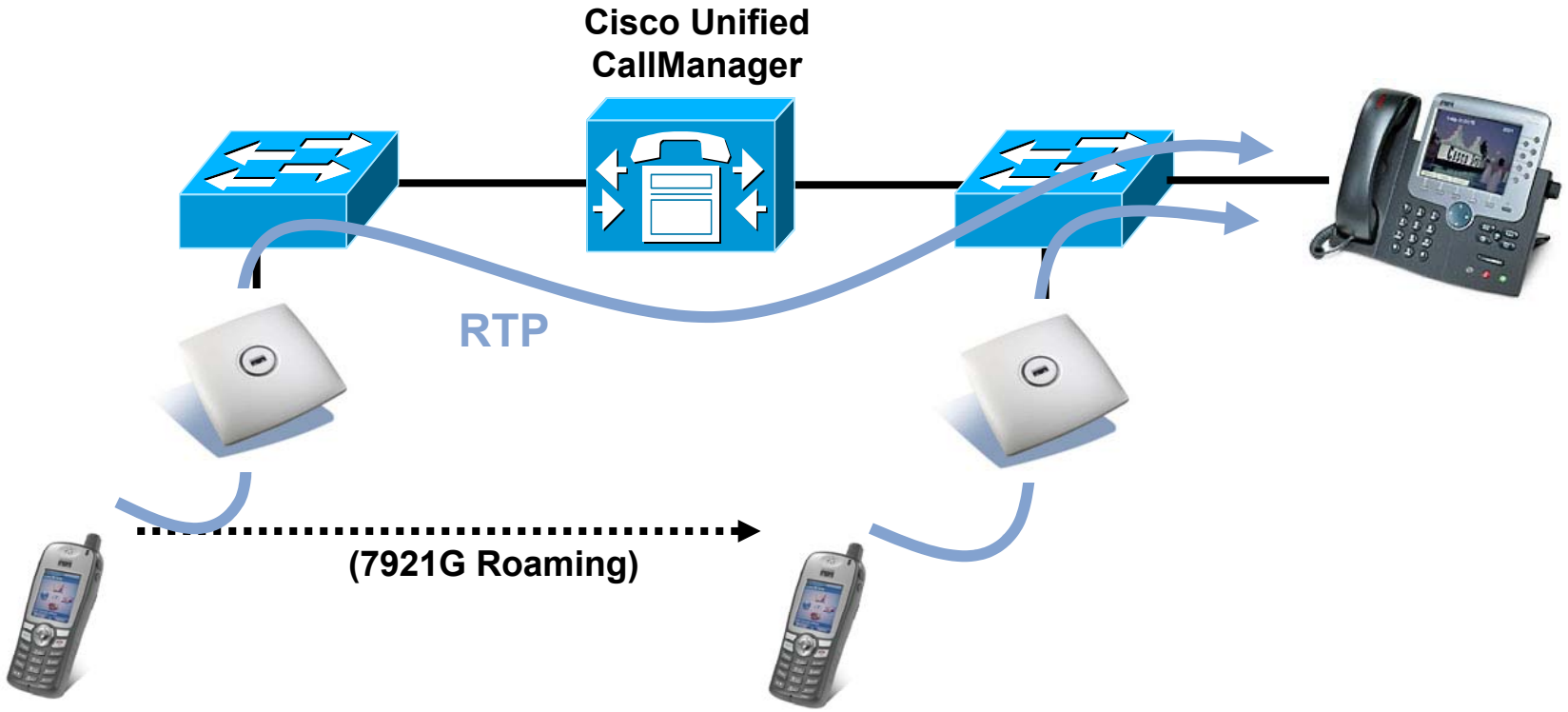


“Pre-Call” Admission Control



- If Call Admission Control (TSPEC) is enabled on the AP, the Cisco Unified Wireless IP Phone 7921G will send an ADDTS (Add Traffic Stream) to the AP to request bandwidth in order to place or receive a call. If the AP send an ADDTS successful message then the Cisco Unified Wireless IP Phone 7921G will establish the call. If the call is rejected via the AP, then the Cisco Unified Wireless IP Phone 7921G will display “Network Busy” if there are no other APs to roam to
- The Cisco Unified Wireless IP Phone 7921G can also use QBSS (QoS Basic Service Set) for outbound CAC. If the QBSS threshold is met (i.e. 105), then the call will not be allowed and will display “Network Busy”
- Cisco Unified CallManager Admission Control (via Locations or Gatekeeper) will be applied if the call-setup is attempted by the Cisco Unified Wireless IP Phone 7921G

“Mid-Call” Admission Control



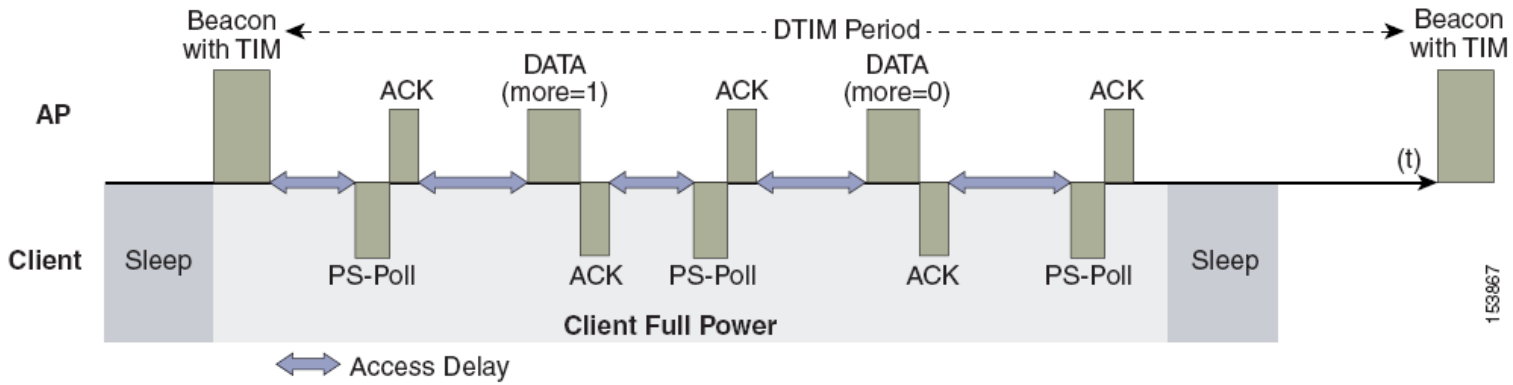
- During a call, the Cisco Unified Wireless IP Phone 7921G will factor in Received Signal Strength Indicator (RSSI) , QoS Basic Service Set (QBSS), Packet Error Rate (PER) values for all available APs to trigger roaming
- If the original AP where the call was established had CAC (TSPEC) enabled, then the Cisco Unified Wireless IP Phone 7921G will send a ADDTS request during the roam to the new AP

Call Capacity

- Ensure the network is designed to accommodate for desired capacity
- Can have up to 20 active RTP streams for both 802.11g and 802.11a @ 54mbps with minimal background traffic depending on initial channel utilization
- At 11mbps can have up to 10 active RTP streams with minimal background traffic

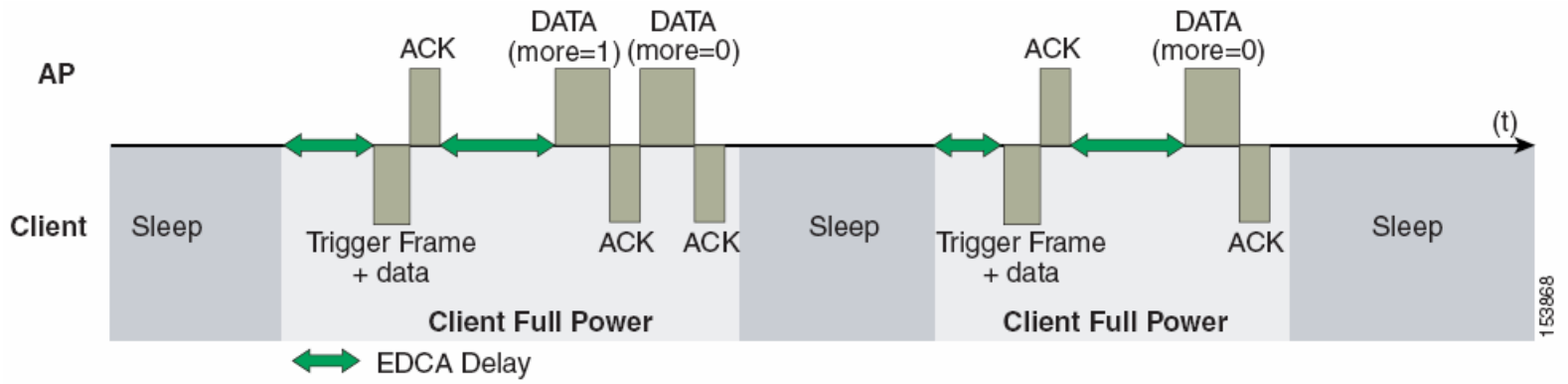
PS-POLL

- The 7921G will use PS-POLL when in idle
- If WMM is disabled on the AP, will also use PS-POLL for power save when on call

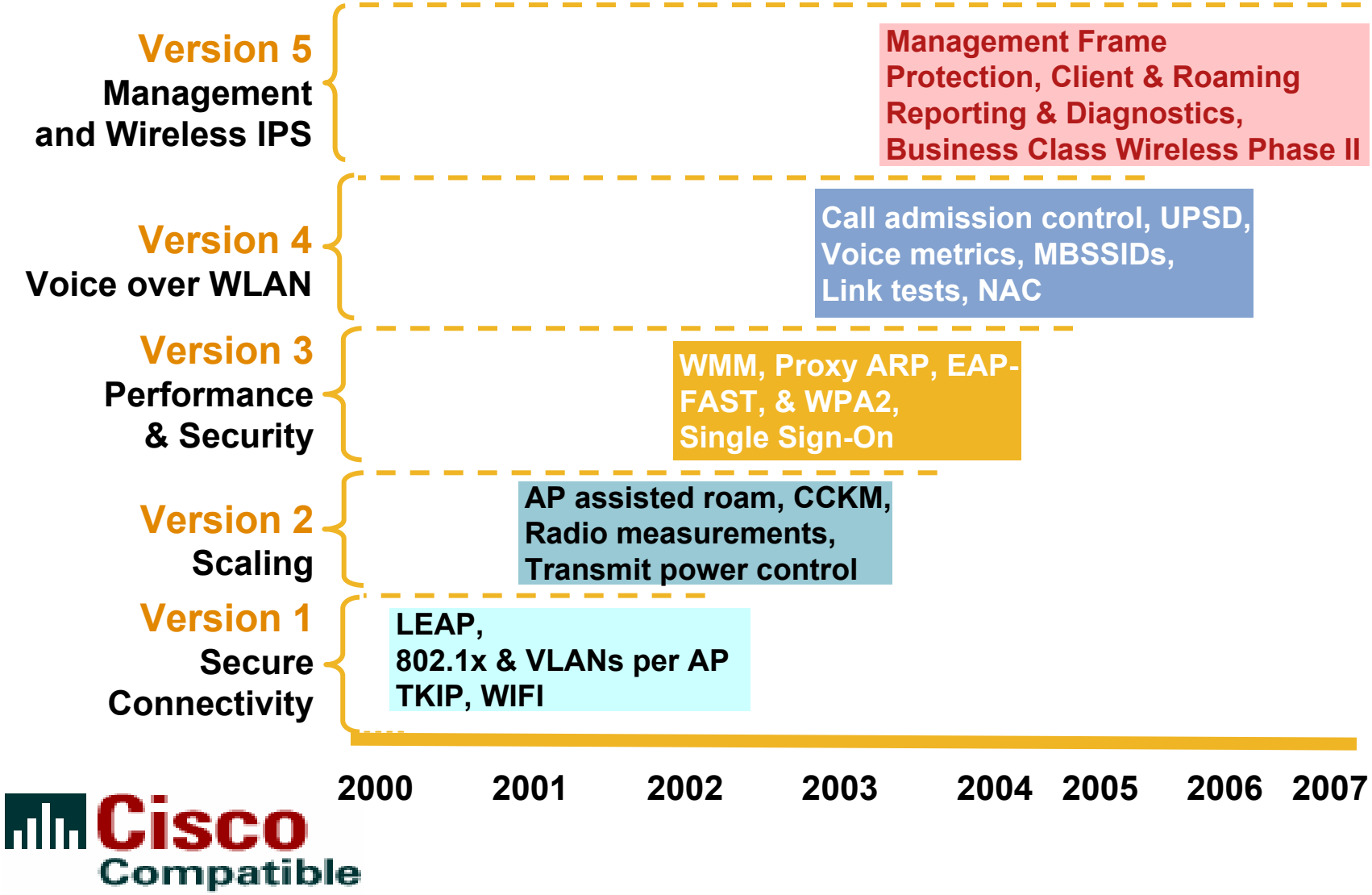


U-APSD

- When WMM is enabled on the AP, the 7921G will use U-APSD (Unscheduled Auto Power Save Delivery) for power save when on call
- U-APSD will help optimize battery life



Cisco Compatible Extensions (CCX) Accelerating Technology Innovation



Cisco Compatible

Cisco 7921G Wireless Phone

- Wi-Fi VoIP Phone
- Support 802.11a/b/g
- Longest Battery Life
  - Standard battery
    - Talk time: 11.5 hrs
    - Standby time: 150 hrs
  - Extended battery
    - Talk time: 15.5 hrs
    - Standby time: 200 hrs
  - Increase is only if the AP supports proxy ARP advertised via CCX IE
- Support Various Security Technology and QoS

7921G Release 1.1

- G.722/Wideband and iLBC

  G722: Improves audio clarity. Utilizes 80 kbps of bandwidth

  iLBC: Enables graceful speech quality degradation in case of packet loss. Utilizes 24 kbps of bandwidth

- EAP-TLS with CCKM
- PEAP (MS-CHAP v2) with CCKM
- Traffic Stream Metrics (CCXv4)
- Traffic Classification (TCLAS)
- Wavelink Avalanche Client
- Site Survey Enhancements
- Local Phone Book and Speed Dials

Nokia Intellisync Client

- Full access to enterprise call control features when on 802.11 network
- Certified with Cisco Unified Communications Manager
- SCCP client; available through Solutions Plus
- New features in version 1.1
  - **Support for the new Nokia E51**
  - License enforcement
  - Calling Name Display
  - **Wireless LAN to GSM handoff**
  - On-line services
  - UI Enhancements

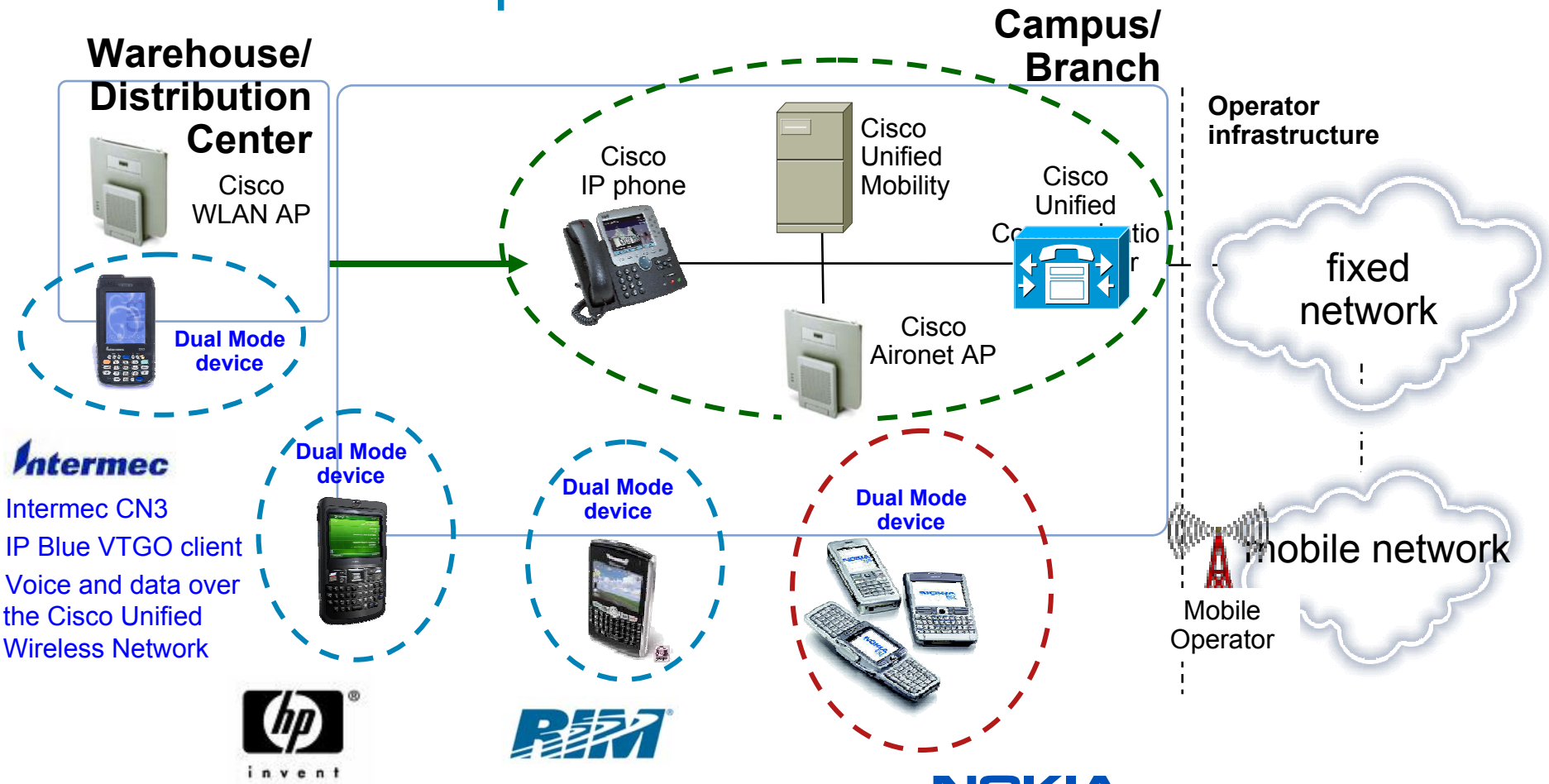
Nokia E61i

Nokia E61

Nokia E51

Nokia E65

Dual Mode Options for Different Mobile Workspaces



- Intermec CN3
- IP Blue VTGO client
- Voice and data over the Cisco Unified Wireless Network

- HP iPAQ 600
- IP Blue VTGO client
- Voice and data over the Cisco Unified Wireless Network

- RIM Blackberry 8820
- Data applications over the Cisco Unified Wireless Network

- Nokia ESeries Devices
- Nokia Intellisync client
- Voice and data over the Cisco Unified Wireless Network

The Cisco Unified Wireless Network VoWLAN Design Guide

- Can be found at:
- http://www.cisco.com/application/pdf/en/us/guest/netsol/ns656/c649/ccmigration_09186a0080923473

Final Q&A