



**Wi-Fi Alliance** ▶



Wi-Fi® is  
**everywhere!**

**WMM™ Power Save  
Overview**



## **WMM™ Power Save Certification began December 5, 2005**



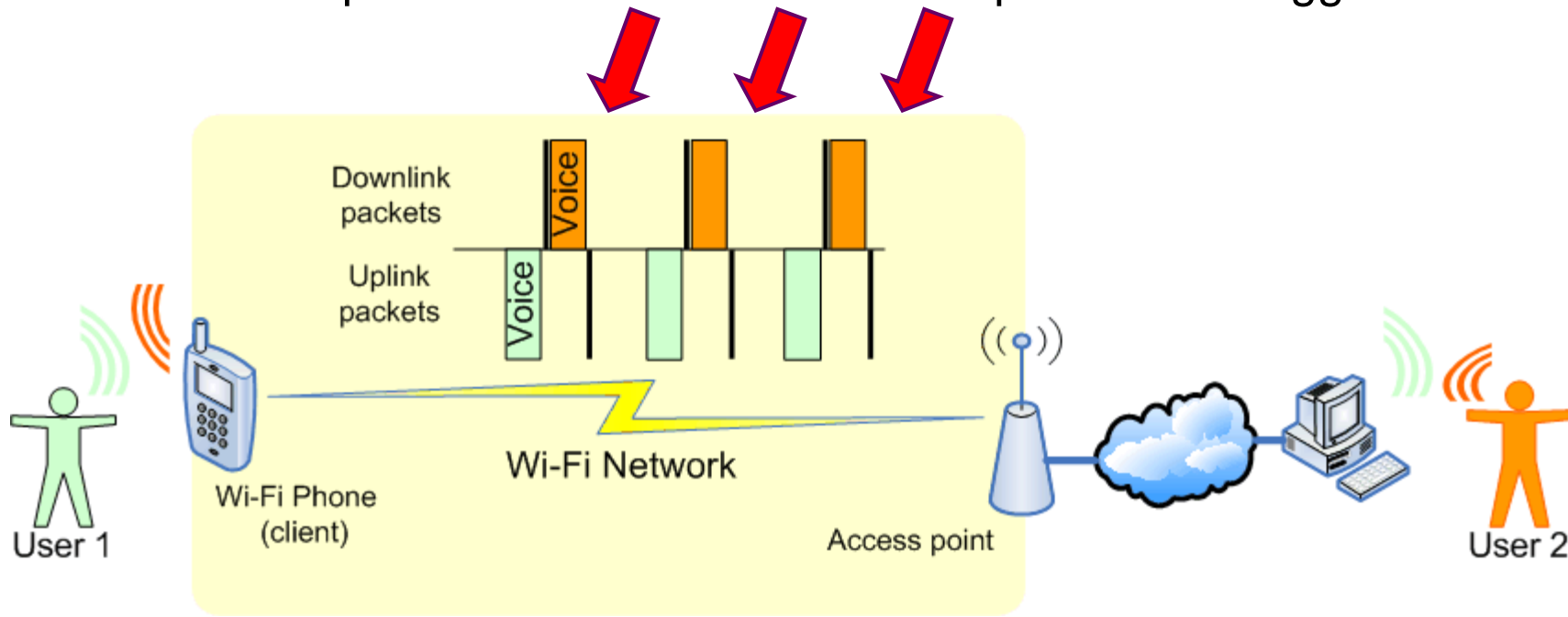
### WMM (Wi-Fi Multimedia) Power Save

- Extends battery life for Wi-Fi devices by increasing efficiency and flexibility of data transmission
  - Data indicates improvements ranging from 15 – 40%
- Uses mechanisms included in IEEE 802.11e standard
- Important milestone and enabler in the growth of Wi-Fi beyond the PC market into
  - Wi-Fi Cellular Convergence products
  - Voice over Wi-Fi applications
  - Consumer Electronics



# ▶ WMM Power Save: How it Works

- Client dozes between packets to save power
  - Application picks time to wake up and transmit uplink trigger for downlink frames
- Access point buffers downlink frames while client dozes
  - Access point waits for client to wake up and send trigger frame





# Features and Benefits of WMM Power Save



Feature	Benefit
<i>Individual applications</i> (instead of the device driver) decide when the client communicates with the access point and how long it can doze	More finely tuned power save mechanism that is customized to individual applications
Uses fewer packets to exchange data	More efficient data transfer than legacy power save = lower power consumption
Coexists with legacy power save devices and networks <ul style="list-style-type: none"><li>– Legacy APs can support WMM Power Save clients (in legacy mode) and vice versa</li><li>– Both AP and client must have WMM Power Save to take advantage of advanced features</li></ul>	Devices work in all Wi-Fi networks, including legacy power save  Easily upgradeable



## ▶ An Important Milestone in the Evolution of Wi-Fi

- As Wi-Fi moves beyond the PC and into new applications, our programs continue to evolve to keep pace
- Mobile devices and consumer electronics are the fastest growing segments for Wi-Fi technology
  - 55 to 100 M converged phones by 2010 (Senza Fili, IDC)
- Wi-Fi has a proven Quality of Service mechanism
  - WMM is well-known for QoS in Wi-Fi networks and improves the user experience for audio, video and voice applications
  - More than 230 products have received optional WMM certification since September 2004

***WMM Power Save expands on our successful WMM™ program to deliver the power efficiency handheld devices require***

# ▶ Important for Developers, Manufacturers and Carriers



- ***Insist*** on Wi-Fi CERTIFIED

## **Device Manufacturers:**

Use only Wi-Fi  
CERTIFIED™  
WMM Power Save  
reference designs  
to ensure  
interoperability  
*for power savings*

## **Carriers:**

Specify Wi-Fi  
CERTIFIED for  
WMM Power Save  
for all equipment  
on your network

## **Application Developers:**

Correctly adapt  
applications for  
WMM Power Save:  
See white paper at  
[www.wi-fi.org](http://www.wi-fi.org)  
for implementation  
tips, tutorial, and  
case study

# ▶ Wi-Fi CERTIFIED™ for WMM Power Save Test Bed:




- Access points:
  - Atheros AR5002AP-2X Access Point
  - Broadcom Corporation Dual Band AP
  - Cisco AIR-AP1231G-A-K9 with AIR-RM21A-A-K9
  - Marvell Semiconductor 802.11a/b/g WLAN router
- Clients
  - Broadcom Corporation Dual Band Client
  - Conexant ISL39200C WorldRadio
  - Ralink 802.11a/g Mini PCI
  - Winbond Mini PCI 802.11a/b/g WLAN Client



# ▶ Wi-Fi Interoperability Certificate



**Wi-Fi® Interoperability Certificate** **Certification ID: W000000**

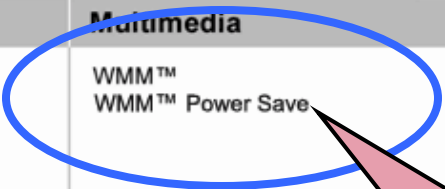
 This certificate represents the capabilities and features that have passed the interoperability testing governed by the Wi-Fi Alliance. Detailed descriptions of these features can be found at [www.wi-fi.org/certificate](http://www.wi-fi.org/certificate)

**Certification Date:** November 23, 2005  
**Category:** Name of Category  
**Company:** Name of Company  
**Product:** Name of Product  
**Model/SKU #:** #####

This product has passed Wi-Fi certification testing for the following standards:

IEEE Standard	Security	Multimedia
802.11a 802.11b 802.11g	WPA™ - Personal WPA™ - Enterprise WPA2™ - Personal WPA2™ - Enterprise	WMM™ WMM™ Power Save

**For more information: [www.wi-fi.org/certificate](http://www.wi-fi.org/certificate)**



WMM Power Save is an optional certification program

## ▶ Summary



- WMM Power Save improves power efficiency in Wi-Fi CERTIFIED™ devices
- WMM Power Save builds on the proven Quality of Service (QoS) offered by the WMM (Wi-Fi Multimedia) Certification Program
- Whitepaper at [www.wi-fi.org](http://www.wi-fi.org) outlines the market potential and details WMM Power Save
  - Application developers should consult for guidance to correctly utilize WMM Power Save
- Certification available now; program is optional





# Wi-Fi Alliance:

Enabling Industry Growth through Product Certification



*At work...*

***Interoperability  
everywhere***



*at home ...*



*on the road ...*

***The best user  
experience***



*even in the air!*

## ▶ Wi-Fi Alliance Overview



- Industry/thought leader and worldwide certification body for WLAN technology
- Driving collaboration within the ecosystem: manufacturers, standard bodies, regulators, service providers, carriers and others
- Non-profit international association of more than 250 member companies and growing ([www.wi-fi.org](http://www.wi-fi.org)); 9 independent authorized test labs in 7 countries
- ***2200 Wi-Fi CERTIFIED products bring interoperability and better user experience to WLAN ecosystem***

