

Introduction to 802.11v

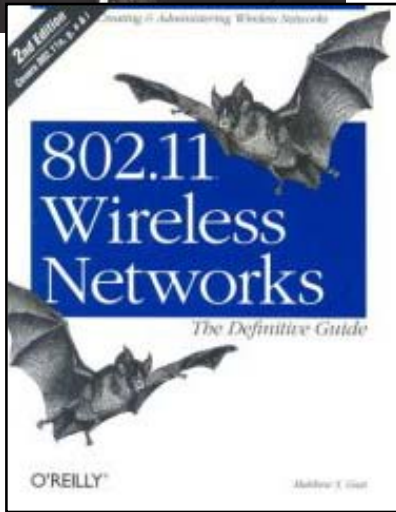
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INTEROP[®]

About Me



- Principal Engineer at Trapeze Networks
 - Product architecture & design
 - Long range planning and evolution of wireless LAN technology
- Chair of Wi-Fi Alliance Wireless Network Management and Security Technical task groups
- Author of 802.11 Wireless Networks: The Definitive Guide (O'Reilly, 2005)
- Founder and board member at the OpenSEA Alliance

Agenda

- IEEE 802.11 TGv (Wireless Network Management)
- TGv Feature Summary
- Example Market Applications

TGv History

- January 2004: Wireless Network Management study group formed
- November 2004: Wireless Networks Management task group formed
 - Purpose: enable better station management, such as monitoring, configuring, updating, and troubleshooting
- September 2005: TG issued CFP
- January/March 2006: work begins on draft
- July 2007: initial letter ballot on draft 1.0
- January 2008: letter ballot on draft 2.0 (63% approval)
- May 2008: letter ballot on draft 3.0 (69% approval)
- Currently anticipating work complete in March 2010

Broad functional categories in 802.11v

- Power saving
- Station management (troubleshooting, diagnostics, & reporting)
- Location
- Timing
- Coexistence

Power Management Features

- WNM (wireless network management) Sleep Mode
 - Further extension to base 802.11 power saving allows for longer power-off times for 802.11 radios
 - Used in conjunction with new Traffic Filtering Service to enable AP to deliver only specified frame types
- Enables “wake on WLAN”
- Proxy ARP
 - AP responds to ARP requests to enable stations to power down for longer periods
- TIM Broadcast
 - Distributes traffic indication map (TIM) so that stations do not need to receive every Beacon frame (~100 ms interval)
- Flexible Broadcast/Multicast service (FBMS)
 - Sends broadcast/multicast frames at highest data rate for the group of receivers; reduces power-on time for radio interfaces
 - Higher data rates improve performance of multicast apps

Station Management Features

- Event reporting
 - Stations can send information on events (e.g. syslog) for troubleshooting purposes
- Diagnostic reporting
 - APs can gather station statistics to improve application performance
- BSS transition management
 - APs direct stations to less loaded APs (load balancing)
 - Reports on transitions for management purposes
- Interference reporting
 - Allows network managers to mitigate effects of localized interference
- Authentication troubleshooting
- Enables large-scale network management (large enterprise, service provider)

New Services

- Multiple BSSID operation
 - Reduces Beacon and Probe traffic to save power and increase airtime utilization efficiency
- Timing synchronization
 - Enables more accurate location capabilities
 - Supports audio synchronization (e.g. Wi-Fi speakers)
- Location format reporting
 - Enables Wi-Fi RFID tags and emergency location for Wi-Fi phones

Sample Applications

- Wake on WLAN
 - Stations wake only for specific frame types
 - Enterprise user puts wireless workstation in sleep mode, then uses remote desktop over VPN from home, causing workstation to wake up
- “Green” wireless office
 - Enhances “wireless office” by reducing power consumption of all devices
 - May include stationary devices (e.g. printers) to save on cabling cost
- Wi-Fi Speakers
 - Accurate timing measurements are required to measure initial offset and drift
 - Requirements: approximately 10 μ s for high-quality stereo sound, lip sync is more forgiving (10-45 ms)
 - Multicast performance is key (FBMS, multicast diagnostics, interference reporting)