22-Jan-11

IEEE 802 Wireless Summary – Amendments under Development

- **802.11ac** – *Very High Throughput 6 GHz* – operation in existing 2.4 and 5 GHz bands, but in wider channels (10, 40, 80, 80+80 and 160 MHz channels); sophisticated beamforming; SU and MU-MIMO (single user and multi-user MIMO)

- **802.11ad** – *Very High Throughput 60 GHz* – > 6 Gbps data rate in 1.88 GHz wide channel in the 60 GHz unlicensed band; OFDM, SC (single carrier) and low power SC modulations supported

- **802.11af** – *TV Whitespace* – operation in the TV Band recently opened by the FCC for unlicensed services; effort focuses on rebanding, including 5 and 10 MHz channels and protocol for communicating with the FCC data base

- **802.11ah** – *Sub 1 GHz* – long-range (1 mile), likely at the expense of throughput; PAR (project authorization report) approved 4-oct-10, ratification expected mid-2013; initial proposals being presented; proposals include HCCA (**H**CF [Hybrid Coordinator Function] **C**ontrolled **C**hannel **A**ccess, i.e. scheduled access) instead of traditional contention-based CSMA/CA; initially targeting 900 MHz unlicensed band, but may also be relevant to 802.11af

- **802.11aa** – *Video Transport Streams* – prioritizing of video streams through LAN bridges, including APs and Ethernet bridges; collaborating with the 802.1AVB group working on layer 2 bridge prioritization

- **802.11ae** – *QoS Management* – prioritization of management frames

- **802.11s** – *Mesh Networking* – scheduled to be ratified in June of 2011

- **802.11u** – *Interworking with External Networks* – focuses on making Wi-Fi services carrier grade with E-911 capabilities and access to service provider database allowing billing; scheduled for ratification in February 2011

- **802.11v** – *Wireless Network Management* – incorporates management features, sleep modes for power management, geolocation and other features; scheduled for ratification in February 2011

- **802.11z** – *Direct Link Setup (DLS)* – operation without the AP to maximize airlink bandwidth for high throughput transmissions such as video streaming; released on 9/30/2010; implemented by 3 major chipset vendors; Wi-Fi Alliance is starting plugfests – initial steps towards certification

- **802.11mb** – *Maintenance* – responsible for integrating new amendments and producing new releases of the standard; next release of 802.11 is expected in the Feb-Mar 2012 timeframe

- **802.18 RR TAG** – *Radio Regulatory Technical Advisory Group* – studying and commenting on the FCC and international spectrum regulations; main focus currently is on 802.11af

- **802.19 TAG** – *Coexistence* – discussing coexistence issues between 802 wireless technologies, including 802.11, 802.16, 802.15, etc.; currently looking at some of the interference to 802.11 by new TDM technologies operating in the 2.4 GHz bands
- **Wi-Fi Alliance** – *liaison report* – WFA now has 385 members; record number of devices being certified; in 2011 expect certification for voice in the enterprise, WNM (wireless network management) and other certifications, including power save for handsets and smart grid applications
- **IETF** – *liaison report* – Mobility EXTensions for IPv6 (mext) group; handover keying (HOKEY); 6 LOWPAN working group related to smart grid; ROLL working group focusing on low power lossy networks; CORE working group security bootstrapping of resource constrained devices; ECRIT (emergency context resolution with internet technologies) – emergency services for devices with no credentials; Geopriv (geographic location and privacy)
- **IEEE 1905.1** – *liaison report* – abstraction layer above MAC (alternate MLME SAP); dynamic routing with end-to-end QoS (neighbor discovery, topology discovery, etc.); works with 1901 (power line), 802.11, 802.3, MOCA; standard to be extendable to other technology; most companies represented in 802.11 are members of 1905.1

Amendment		Task Group	Standards Board Approval
802.11ah	Sub 1 GHz	TGah	July 2013
802.11ad	Very High Throughput 60 GHz	TGad	December 2012
802.11ac	Very High Throughput < 6 GHz	TGac	December 2012
802.11ae	QoS Management	TGae	March 2012
802.11af	TV Whitespace	TGaf	March 2012
802.11aa	Video Transport Streams	TGaa	March 2012
802.12 Release	Maintenance	TGmb	December 2011

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