

3rd Wi-Fi India Summit 2022

Using 6GHz Wi-Fi to Enable PM-WANI

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6GHz - Wi-Fi 6E Complementary Modes of Operations

**LOW POWER INDOOR
(LPI)**
Indoor Only

Worldwide Adoption
30 dBm US/AMERICA
(23 dBm CEPT/EU)

- Residential Multi-AP/mesh networks
- Multiple dwelling unit Single AP networks
- High-density enterprise networks
- Indoor public venues
- Industrial IoT

**VERY LOW POWER
(VLP)**
Indoor and Outdoor

Worldwide Adoption
US Under Consideration
14 dBm AMERICA/EU
(17 dBm for 320MHz)

- Augmented Reality/Virtual Reality/Mixed Reality (AR/VR/XR)
- UHD Video Streaming & Multicasting
- High Speed Tethering/File Sharing
- In-Vehicle Entertainment
- Wi-Fi Hotspot

**CLIENT TO CLIENT
(C2C)**
Indoor Only

EU adoption
US Under Consideration
23/24 dBm Based on LPI

- Indoor Immersive VR
- UHD Video Streaming
- File Sharing/Multicasting
- Wi-Fi Hotspot

**STANDARD POWER
FIXED (SP, AFC)**
Indoor and Outdoor

North America, APAC,
ME Adoption
36 dBm

- Multigigabit per second outdoor coverage (e.g., parks, stadiums, LinkNYC)
- Multigigabit point-to-multipoint rural connectivity
- Low-latency Wi-Fi calls, and next-gen experiences with AR/VR/XR

Using Wi-Fi 6E to enable PM-WANI

- Wi-Fi 6E Low Power Indoor (LPI) and Standard Power (SP) to enable public Wi-Fi
 - To enable indoor and outdoor public Wi-Fi to urban, suburban and rural areas
- Coverage of rural areas through Standard Power Automated Frequency Coordination or equivalent coordination mechanism
 - Protection of incumbent fixed services through AFC
 - Allocation of frequency and max power level for outdoor public hotspots
 - 6GHz In-band back-haul support through manually or AFC enabled coordinated fixed point-to-point devices
- AFC System could be a natural addition to the PM-WANI centralized Wi-Fi Access Network Interface with PDO/PDOA/Central Registry elements
- 6GHz LPI and SP complementary indoor service for urban & suburban offering
 - a. Gigabit service performance for high throughput performance demand of innovative applications of today and tomorrow (AR/VR/XR) plus
 - b. Coverage performance equivalent to that of 5GHz Wi-Fi (Wi-Fi 5 & Wi-Fi 6)

6 GHz - Wi-Fi 6E Products Are Here! (Oct'21)

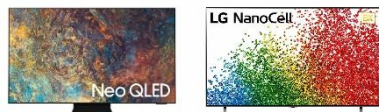
Routers / Access Points (13)

- Asus
 - ROG GT-AXE11000
 - ZenWiFi ET8 (Mesh)
 - ZenWiFi Pro ET12 (Mesh)
- Netgear
 - Nighthawk RAXE500
 - Nighthawk RAXE450
- Linksys
 - Hydra Pro 6E (Mesh)
 - Atlas Max 6E (Mesh)
- TP-Link
 - Archer AX96, AX206
 - Deco X96 (Mesh), X76 (Mesh)
- Aruba
 - AP-635
- Extreme Networks
 - AP4000



Smart TVs (5)

- Samsung
 - Neo QLED 8K
- LG
 - OLED, QNED, NanoCell



Desktop PC MBs (13+)

- MSI
- Gigabyte
- Asus
- Asrock



Smartphones (14)

- Samsung
 - Galaxy S21 Ultra
 - Galaxy Z Fold 3
- Asus
 - ROG Phone 5S
 - ROG Phone 5S Pro
 - ZenFone 8
 - ZenFone 8 Flip
- Xiaomi: Mi Mix 4
- Oppo: Find X3 Pro
- Nubia: RedMagic 6
- ZTE: Axon 30 Ultra
- Motorola: Edge 20
- Google: Pixel 6 / 6 Pro



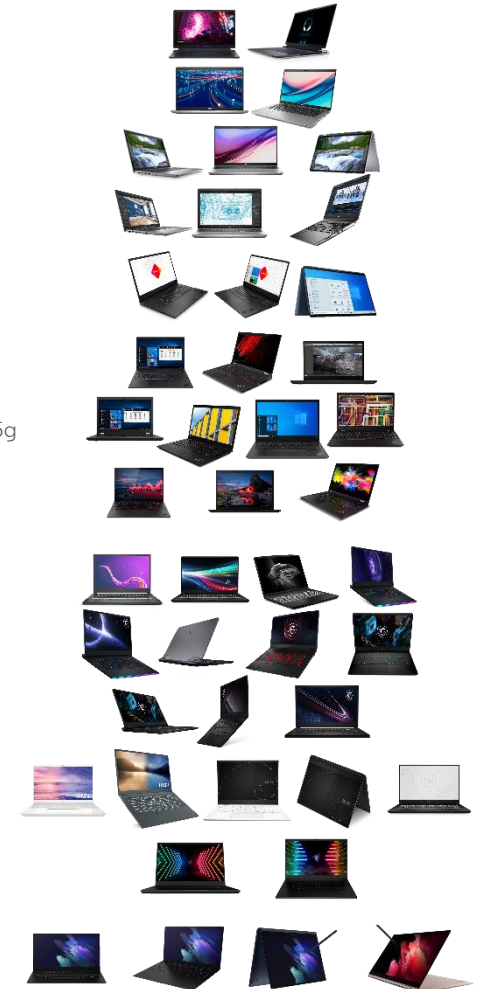
Desktop PCs (13)

- MSI
 - Aegis RS 11
 - Creator P50
 - MAG Codex 5 11
 - MAG Codex X5 11
 - MAG Infinite S3 11
 - MEG Aegis Ti5 11
 - MEG Infinite X 11
 - MPG Trident 3 11
 - MPG Trident AS 11
- Asus
 - ExpertCenter AIO E5
- Intel
 - NUC 11 Extreme
 - NUC 11 Enthusiast



Laptop PCs (61)

- Dell
 - AWX15, X17
 - Latitude 5320, 5420, 5520,
 - Latitude 5421, 5521,
 - Latitude 9420
 - Precision 3560, 3561,
 - Precision 7560, 7760
- HP
 - Omen 16, 17
 - Spectre x360 16 (Evo)
- Lenovo
 - ThinkPad P1, P15, P15s, P17
 - ThinkPad T14, T14s, T15, T15g
 - ThinkPad X1 Extreme, X13
- MSI
 - Creator 15, 17, M16, Z16
 - GE66, 76
 - GL66, 76
 - GP66, 76
 - GS66, 76
 - Prestige 14 (Evo), 15
 - Summit E13 Flip (Evo),
 - Summit E16 Flip (Evo)
 - WE76
 - WS66, 76
- Razer
 - Blade 15 Advanced
 - Blade Pro 17
 - Blade 17
- Samsung
 - Galaxy Book Pro 13, 15
 - Galaxy Book Pro 360 13, 15



Many more to come...

Proposed 6 GHz Technical Framework (LPI¹, VLP², and SP³)

Operating band	5925-7125 MHz		
Device category	Low-Power Access Point	Very Low Power mobile equipment Including C2C	Standard-Power Access Point
Operating location	Indoor only	Indoor & Outdoor	Indoor & Outdoor
Licensing scheme	License-exempt	License-exempt	License-exempt with <u>supervision of AFC System</u> Interference Protection Criteria = -6 dB I/N
Transmit power (e.i.r.p.)	30 dBm	17 dBm	36 dBm

¹**LPI:** Based on comprehensive studies of coexistence between Wi-Fi and incumbent users (FS and FSS) of the 5925-7125 MHz band conducted in the United States; Also adopted by other countries in America including Canada, Brazil, Chile and Peru and being considered by others.

²**VLP:** Based on coexistence studies between Wi-Fi and incumbent conducted by Ofcom UK and ECC and extended to 17 dBm for 320MHz Wi-Fi 7; Also adopted by other countries in Asia, EMEA and Americas. Under consideration by US FCC.

³**Standard Power:** Based on comprehensive studies of coexistence between Wi-Fi and incumbent users (FS and FSS) of the 5925-7125 MHz band conducted in the United States for Indoor and Outdoor operation;

- Also adopted or under considerations by other countries including Canada, Saudi Arabia, S. Korea Mexico and Australia.

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