MEDIATEK

No More Interference: Get faster, more reliable Wi-Fi 7 connectivity with MRU and smart puncturing

Introducing MRU (Multiple Resource Units)

To support the increasing network demands of high-throughput/low-latency use cases and multiple simultaneous users in dense environments, Wi-Fi 7 introduces a new MRU feature in the EHT PHY to enhance interference mitigation and OFDMA (Orthogonal Frequency Division Multiple Access) efficiency.

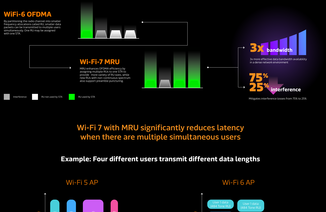
High-throughput/low-latency use cases:

- Wireless VR/headsets
- Video Calls
- Cloud Gaming
- P2P File Transfer

An MRU consists of combinations of RUs:

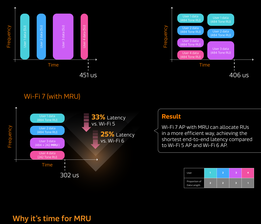
Small-size RUs	26-tone RU 52-tone RU 106-tone RU
Large-size RUs (Large-size RU can only be combined with other large-size RUs)	242-tone RU 484-tone RU 996-tone RU 2x996-tone RU 4x996-tone RU

The next evolution of Wi-Fi reliability



Wi-Fi 7 with MRU significantly reduces latency when there are multiple simultaneous users

Example: Four different users transmit different data lengths



Result

Wi-Fi 7 AP with MRU can allocate RUs to STAs efficiently without leaving the channel idle to cut latency compared to Wi-Fi 5 AP and Wi-Fi 6 AP.

AP		X	X	X
Wi-Fi 5	X			
Wi-Fi 6	X	X		
Wi-Fi 7	X	X	X	

Why it's time for MRU

With multiple users and a rising number of Wi-Fi devices, the 5GHz band is getting more crowded than ever before.

Did you know?

In April 2020, the U.S. Federal Communications Commission (FCC) made the entire 1200 MHz spectrum (5910-7125 MHz) available in the 6GHz band for unlicensed Wi-Fi use to help improve:

- Capacity
- Throughput
- Interference mitigations

MRU supports deployment in 5GHz and 6GHz bands with static puncturing

To help deployment in 5GHz and 6GHz bands, preamble puncturing improves spectral efficiency by puncturing an overlapping portion of the spectrum channel. With static puncturing as defined in Wi-Fi 7, AP controls the punctured pattern for all STAs in the BSS.

But static puncturing may still experience interference

- Interference problems are highly location-dependent.
- STAs in the same BSS may experience interference in different sub-channels.

Evolve beyond static puncturing with smart puncturing from MediaTek

MediaTek has designed a smart puncturing mechanism with more flexible and effective channel puncturing. With smart puncturing from MediaTek, system performance is enhanced significantly in distributed multi-interference scenarios.

How smart puncturing from MediaTek improves throughput efficiency

User Scenario: Dynamic Puncturing for Peer-to-Peer (P2P) Application

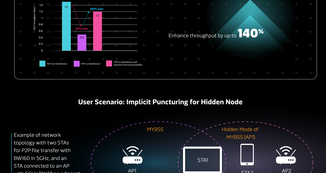
Challenge

Interference problems can become more severe in P2P applications, such as device-to-device file transfer, high-quality Wi-Fi display, AR/VR and more. Static puncturing cannot mitigate the interference problem in the P2P application as the punctured pattern is not selected based on the information from STA.

Solution

Use dynamic puncturing for P2P applications.

Throughput Gain with Dynamic Puncturing for P2P Application



User Scenario: Implicit Puncturing for Hidden Node

	Baseline	w/o implicit puncture	w/ implicit puncture
TCP DL	3.1G	1G	1.9~2.4G (delat = 2.33G)
Bi-Directional UDP	DL/UL 1G/1G	DL/UL 180~400/805~900M	DL/UL 800~850/760~820M

90%~140% gain

100%~370% gain

Challenge

Hidden node is a common problem in Wi-Fi networks that degrades throughput and is highly location-dependent.

Solution

Reinforce dynamic puncturing with intelligent implicit puncturing to learn the Transmission (TX) behavior from peer STA in real-time.

MediaTek Smart Puncturing Result:

90%~140% throughput gain for downlink TCP

100%~370% throughput gain for bi-directional UDP

Get ready for Wi-Fi 7 with the latest in MRU innovation from MediaTek

MediaTek's innovations and product platforms are ready to support next-generation MRU reliability using our just-announced Filogic 880 and Filogic 380 high performance, power-efficient and reliable Wi-Fi solutions.

Prepare for the future with MediaTek Filogic

Whether you are ready to deploy Wi-Fi 6/6E solutions today or are planning for Wi-Fi 7, you can count on Filogic to keep you connected.

Discover MediaTek Filogic

About MediaTek

MediaTek is the world's largest supplier of Wi-Fi solutions and the fourth-largest global fabless semiconductor company, powering more than two billion devices a year. We build chips that are less about connecting people to their devices and more about connecting your devices to what matters.

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