Wi-Fi 7 (802.11be) Requirements Specification

# 1. Introduction

Wi-Fi 7, also known as IEEE 802.11be, is the next-generation wireless standard designed to provide extremely high throughput, lower latency, and improved reliability.

# 2. Performance Requirements

Wi-Fi 7 must support peak data rates exceeding 30 Gbps, with at least 4x improvement over Wi-Fi 6 in real-world scenarios.

# 3. Latency and Throughput

The system must ensure latency below 5 milliseconds in high-density environments and provide consistent throughput even under interference.

# 4. Channel Width & Frequency Bands

Support for up to 320 MHz wide channels in the 6 GHz band is mandatory. Backward compatibility with 2.4 GHz and 5 GHz bands is required.

# 5. Security Enhancements

Wi-Fi 7 must support WPA3 as a minimum standard and introduce enhanced encryption and authentication mechanisms for IoT devices.

# 6. Backward Compatibility

Devices must be able to interoperate with legacy Wi-Fi 4, 5, and 6 devices, with graceful degradation of features as needed.

# 7. Multi-Link Operation (MLO)

The system should enable simultaneous transmission and reception across multiple frequency bands to improve throughput and reduce latency.

# 8. Target Wake Time (TWT) Enhancements

Improved TWT mechanisms must be implemented for power saving, especially in battery-operated devices.

# 9. Quality of Service (QoS) Requirements

Advanced QoS features should ensure high-priority traffic like video and voice are delivered with minimal jitter and packet loss.

# 10. Power Efficiency Goals

Wi-Fi 7 implementations should demonstrate at least 20% better power efficiency than Wi-Fi 6 under similar usage conditions.