Computer Networks.

Assignment - 2

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1. • OFDMA (Orthogonal frequency Division Multiple access):

OFDMA in WiFi 6/6E/7 improves efficiency by dividing a channel into smaller resource units (RUs), allowing multiple devices to transmit or receive data simultaneously. This reduces intra-BSS interference, lowers latency for small packets, and minimizes channel contention and airtime wastage caused by sequential transmissions in older wifi standards.

• BSS coloring:

BSS coloring in wifi 6/6E/7 hepls reduce inter-BSS interference by assigning each network a unique 'color'. Devices use this to differentiate their own BSS from overlapping ones and apply a higher CCA threshold to ignore weak, non-interfering signals from distant networks. This enables better spatial reuse, allowing more networks to transmit simultaneously on the same channel, boosting capacity in dense environments.

2. Latency reduction is absolutely critical in factory automation for several key reasons; few are,

1. Real-time control and synchronization.
2. Closed-loop control systems.
3. Safety systems.
4. Cycle time and throughput.
5. Determinism.
6. Protocol requirements.