

## BEYOND OFDM

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Orthogonal Frequency Division Multiplexing (OFDM) is a convenient technique for dealing with delay-spread (frequency-dependent) channels. An essential feature of OFDM is the cyclic prefix: a redundant periodic extension of the message-bearing sinewaves, which for proper functioning must be at least as long as the delay-spread of the channel. If the symbol interval can be made large compared with the cyclic prefix then the potential throughput of OFDM approaches the Shannon limit. Conversely if latency concerns, or a rapidly changing propagation environment, preclude using a long symbol interval then the cyclic prefix can be a major source of inefficiency.

We propose a new technique as an alternative to OFDM in applications where the symbol interval is comparable to the delay-spread. We obviate the need for a cyclic prefix and achieve greater throughput than OFDM. For example in a point-to-point link where the symbol interval is equal to the delay-spread, then OFDM cannot function at all (the cyclic prefix occupies the entire symbol interval), while the new technique can theoretically provide approximately half of the Shannon capacity.