Calix
Simplify. Innovate. Grow.

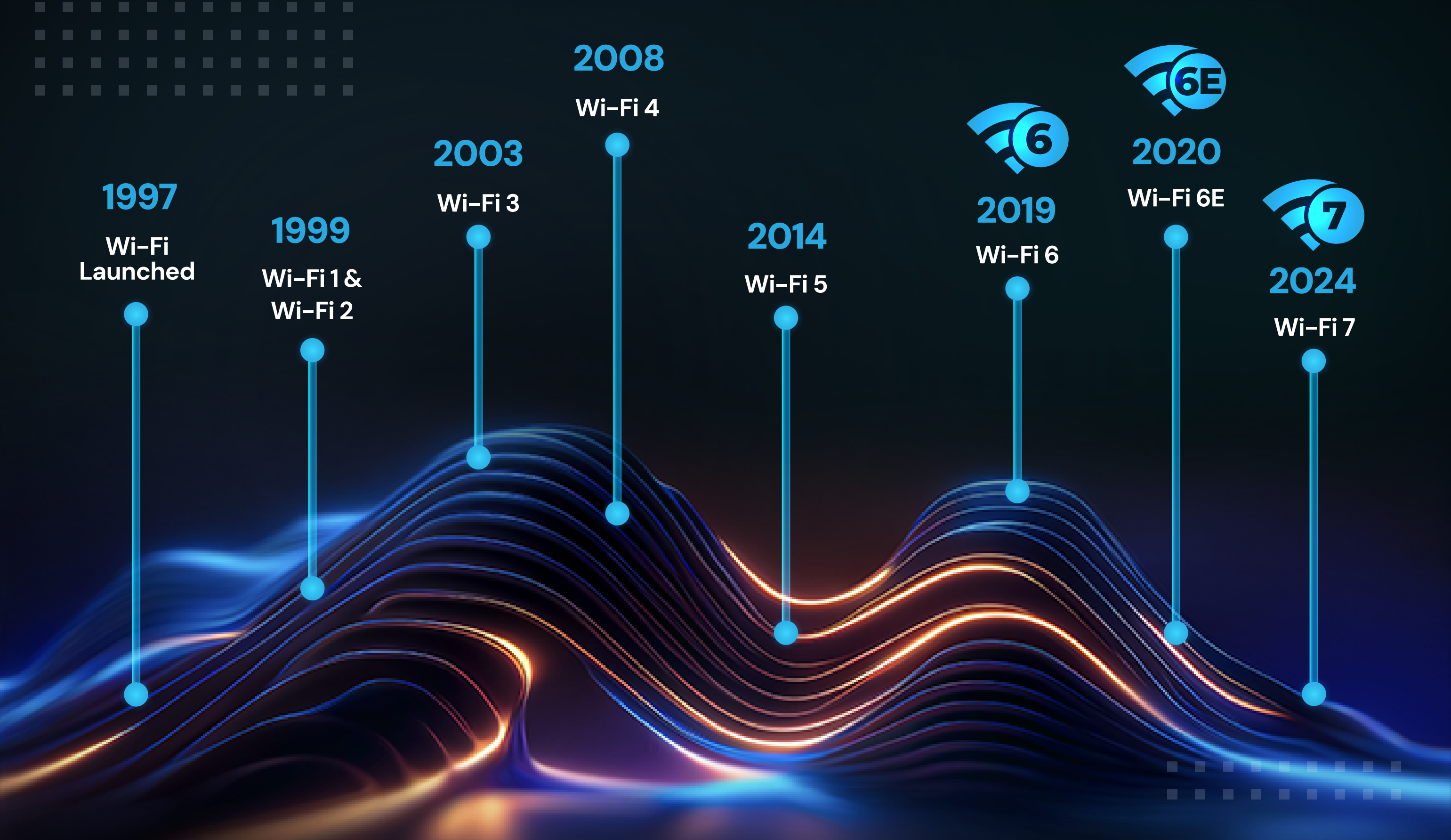
Unlimited Subscriber™

The Evolution of Wi-Fi

WI-FI STANDARDS

When you connect to a Wi-Fi signal, the experience can vastly differ based on the Wi-Fi standard. With each generation of Wi-Fi comes new benefits and value over its predecessor, with Wi-Fi 7 promising another significant boost in performance and quality of experience.

TIMELINE: WI-FI STANDARDS



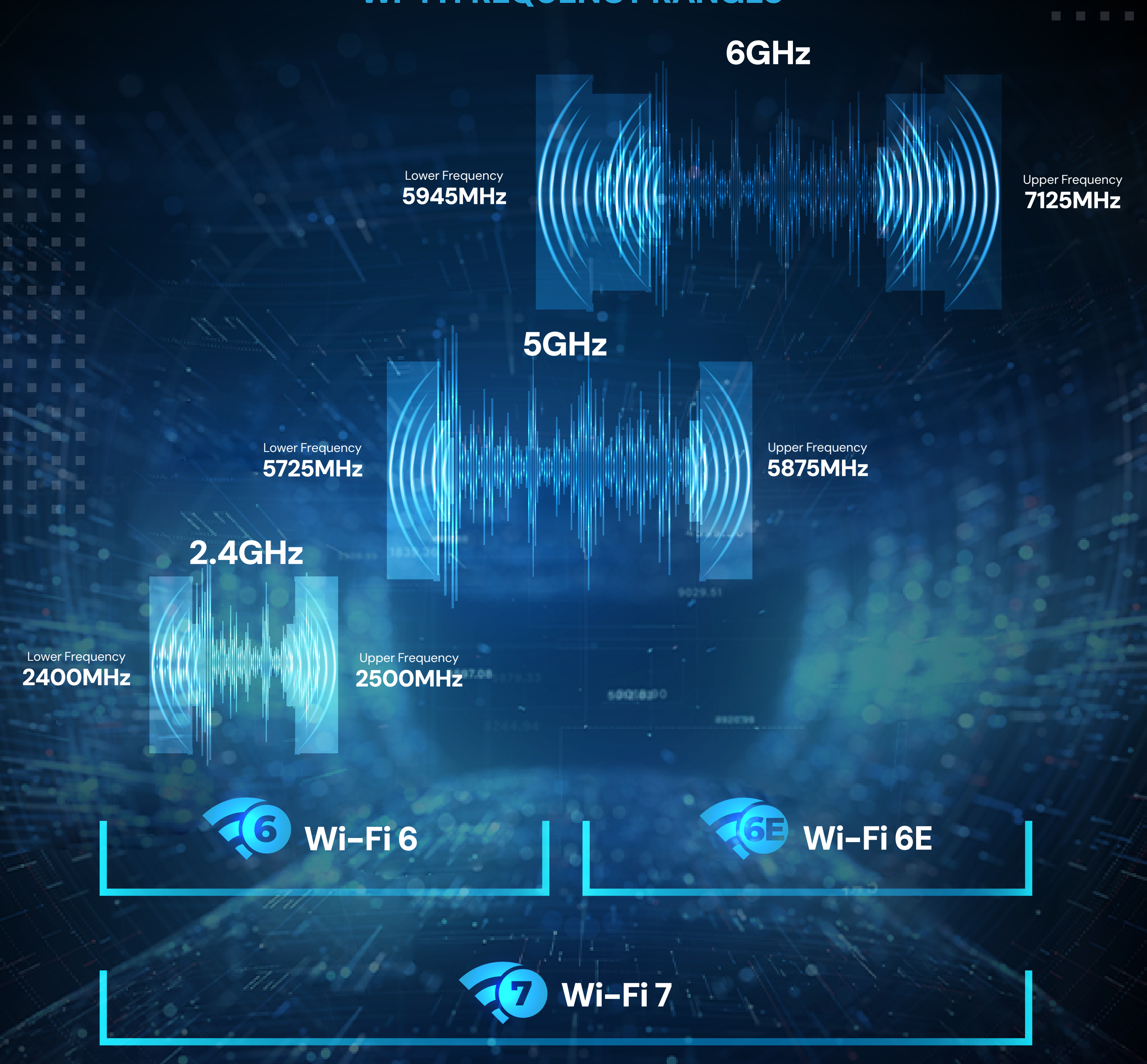
THE DIFFERENCES BETWEEN WI-FI 6, 6E, AND 7

	6	6E	7
IEEE Standard	802.11az		802.11be
Frequency	2.4GHz, 5GHz	6GHz	2.4GHz, 5GHz, 6GHz
Channel Bandwidth	20, 40, 80, 160MHz		Up to 320MHz
Highest Modulation	1024-QAM		4096-QAM
Max # of Spatial Streams	8 x 8		16 x 16
Maximum Speed	9.6Gbps		46.4Gbps
Security	WPA3		

MAXIMUM SPEED

The maximum sustainable throughput of your connection is based on the channel width selected within each frequency.

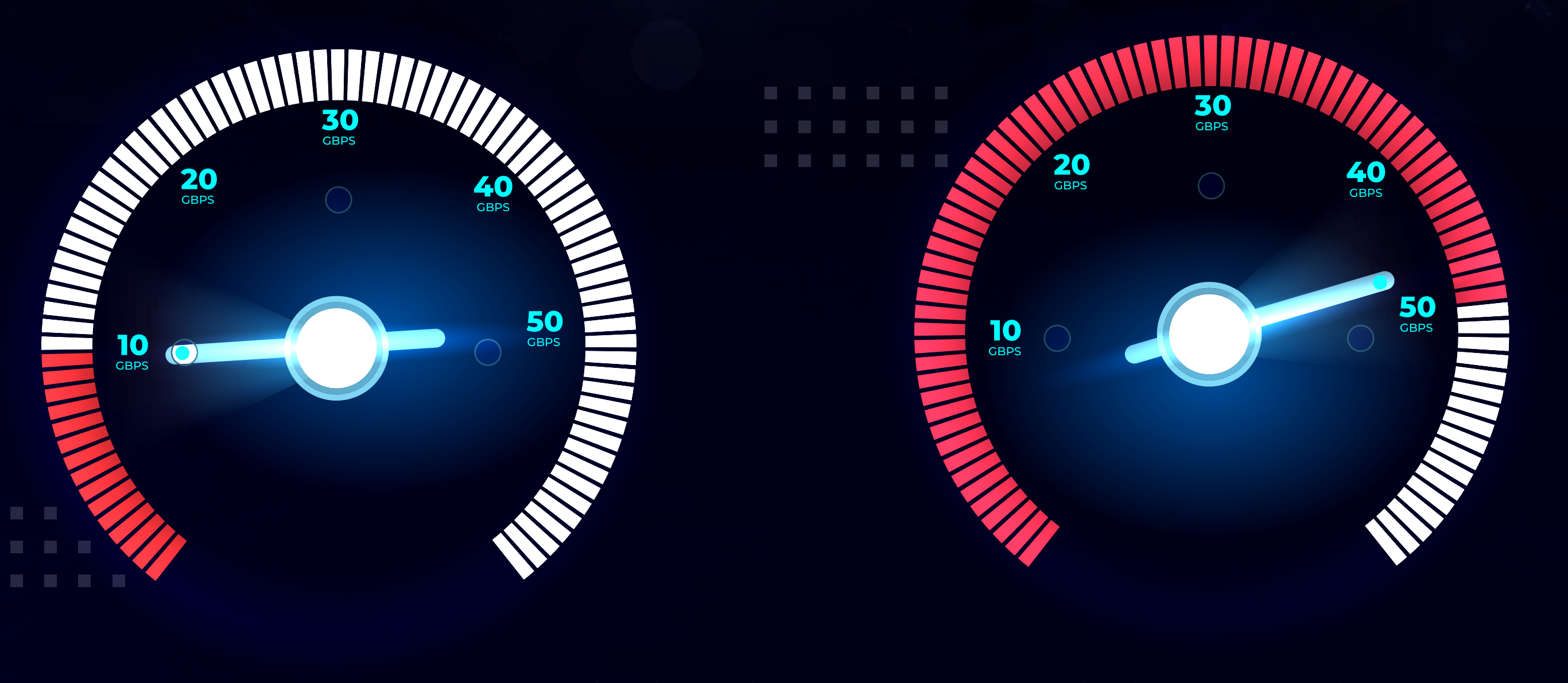
WI-FI FREQUENCY RANGES



Wi-Fi 6 operates only over the 2.4GHz and 5GHz spectrums. Wi-Fi 6E and Wi-Fi 7 pick up the 6GHz spectrum, enabling higher performance and greater concentration of connections across all frequency ranges.

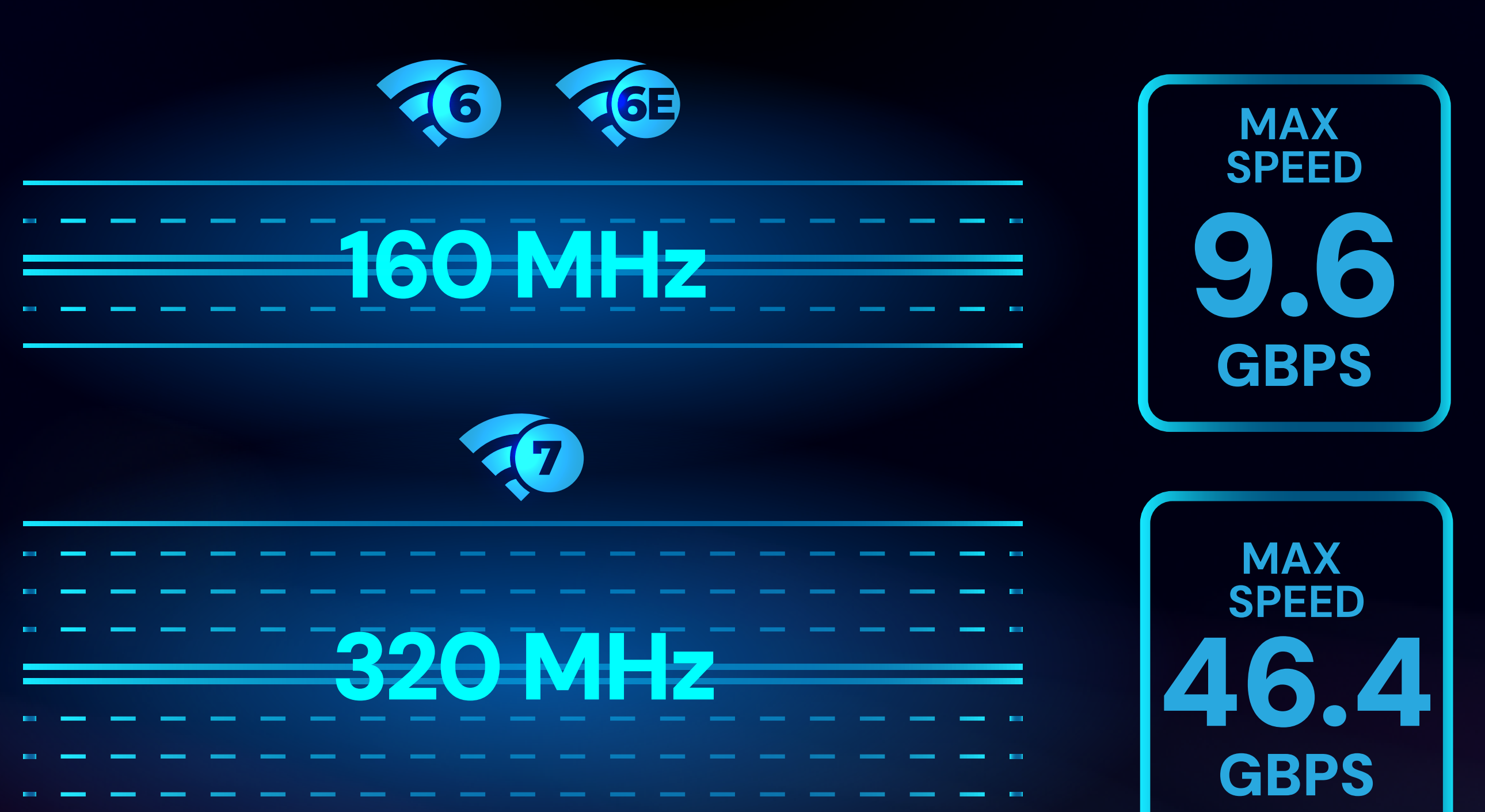
The maximum speed for Wi-Fi 6/6E is 9.6Gbps.

The maximum speed for Wi-Fi 7 is 46.4Gbps. (**Over 4x increase!**)



Are there trade-offs to achieving higher speeds? Wi-Fi connectivity to the device is impacted by distance and structural obstacles. Higher spectrums experience less signal propagation due to material interference. So, the lower the transmitting spectrum, the better the coverage area.

CHANNEL WIDTH



MODULATION

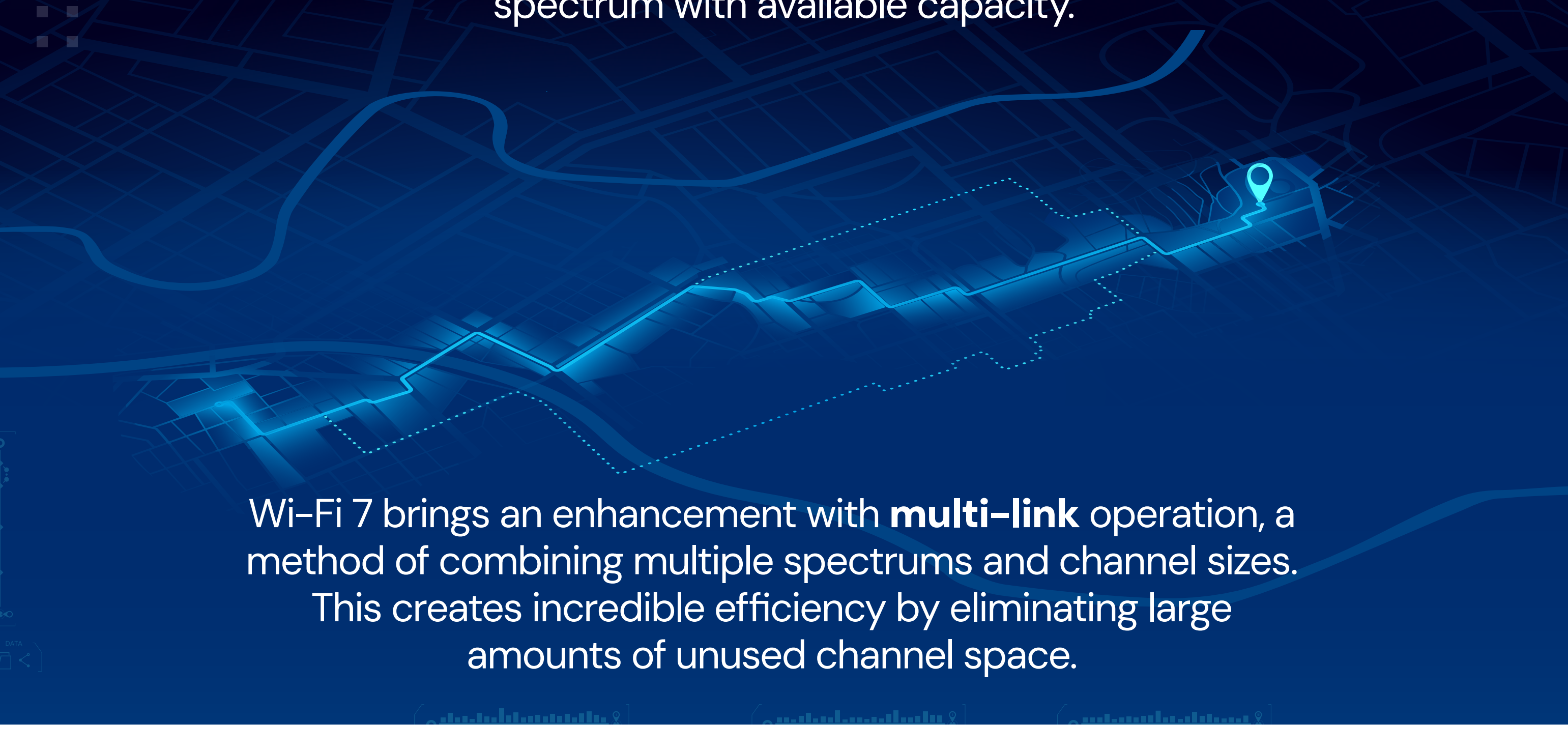
Modulation sends digital information over an analog connection (i.e., wireless) and plays a key role in evolving Wi-Fi standards.

Modulation relates to spectrum efficiency and plays a key role in Wi-Fi performance. Wi-Fi 7 offers twice the bandwidth capacity and four times the compression of Wi-Fi 6/6E due to 4K QAM (quadrature amplitude modulation). Essentially, it enables packing more information in the same space.

It's like seeing an image in low resolution vs high resolution. The more data packed in the space, the higher the throughput.

CONNECTION MANAGEMENT

Frequency shifting has helped alleviate the overloading of a single spectrum by redirecting Wi-Fi connections to a spectrum with available capacity.



Wi-Fi 7 brings an enhancement with **multi-link** operation, a method of combining multiple spectrums and channel sizes. This creates incredible efficiency by eliminating large amounts of unused channel space.

THE CALIX ADVANTAGE

Broadband service providers (BSPs) know that competing on speed alone is the great equalizer and not a sustainable customer retention strategy. That's why Calix provides a complete set of tools to deliver an exceptional end-to-end Wi-Fi experience. The harmonious interaction of Calix's core hardware, edge systems, cloud applications, and subscriber apps enables BSPs to deliver a high-performance and high-availability network while ensuring an outstanding subscriber experience.

ARE YOU READY FOR WI-FI 7?

Learn more

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