



Wi-Fi 7 – unlocking the next level of Wi-Fi performance

Andy Davidson

Sr Dir, Technology Planning
Qualcomm Technologies, Inc.



New use cases bring demand for higher Wi-Fi performance

Extreme speeds

Extreme capacity

Consistent Low Latency



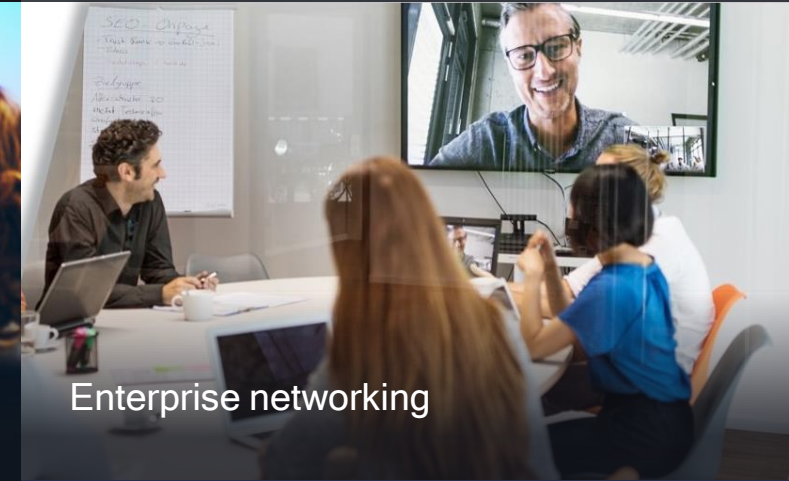
Crowded network



Venue connectivity



Cloud gaming



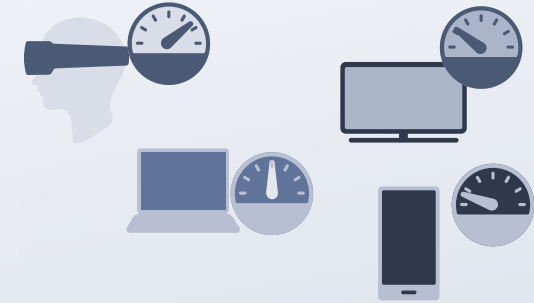
Enterprise networking



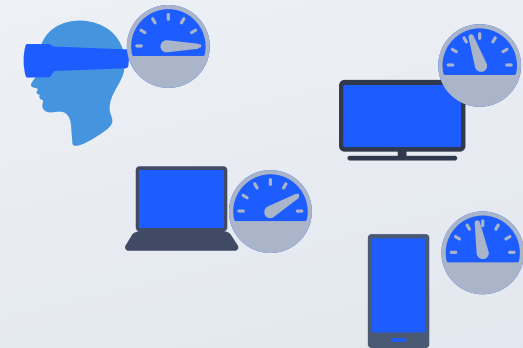
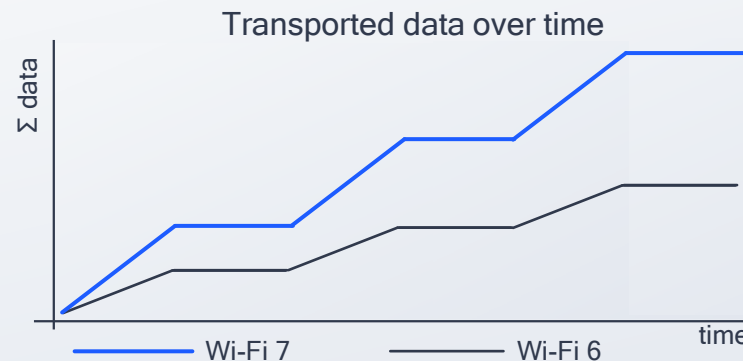
VR



AR/XR

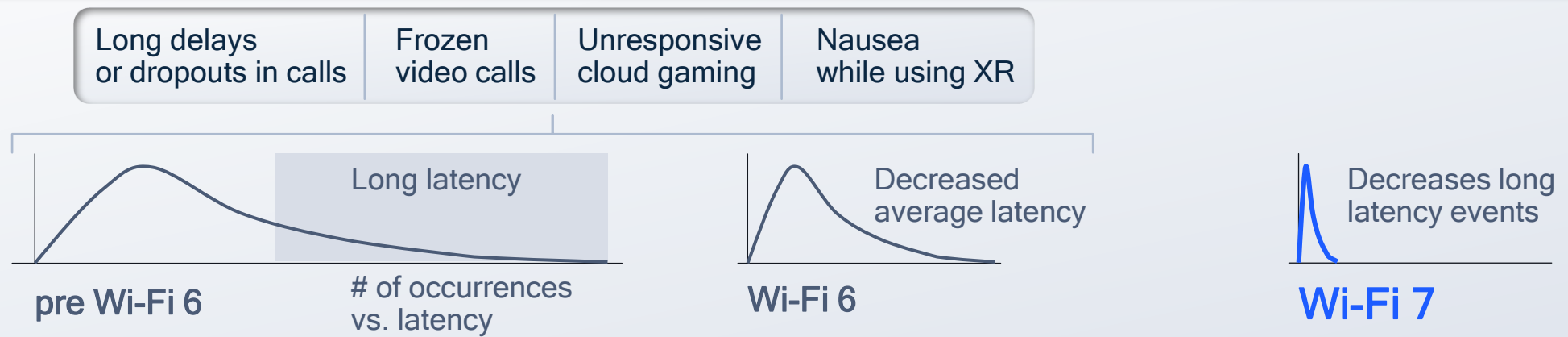
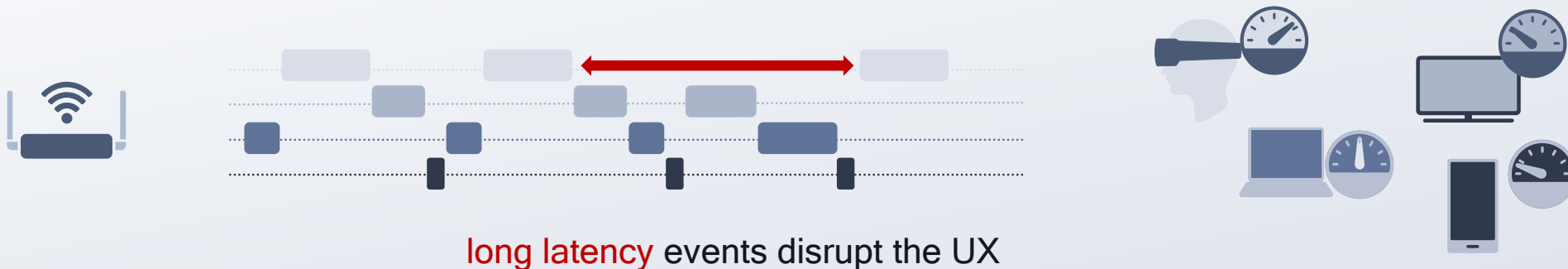


Overlapping traffic limits devices' channel access opportunities



Higher speed devices transfer more data in each opportunity

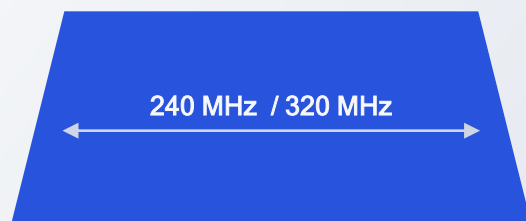
Faster connections deliver required throughput
even in congested networks



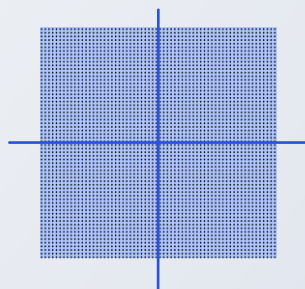
Wi-Fi 7 meets stricter application latency requirements

Faster connections

Wider Channel Bandwidth



4k QAM



Adaptive connections

Interference Puncturing

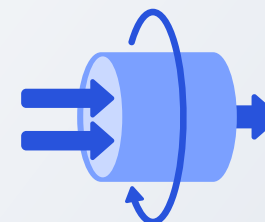


Multi-RU OFDMA

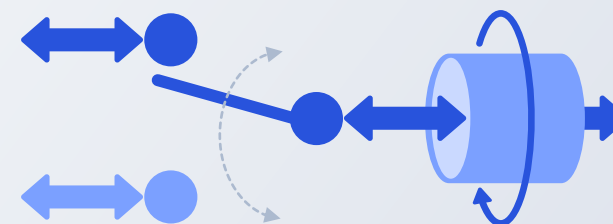


Multiple connections

Simultaneous Multi-Link



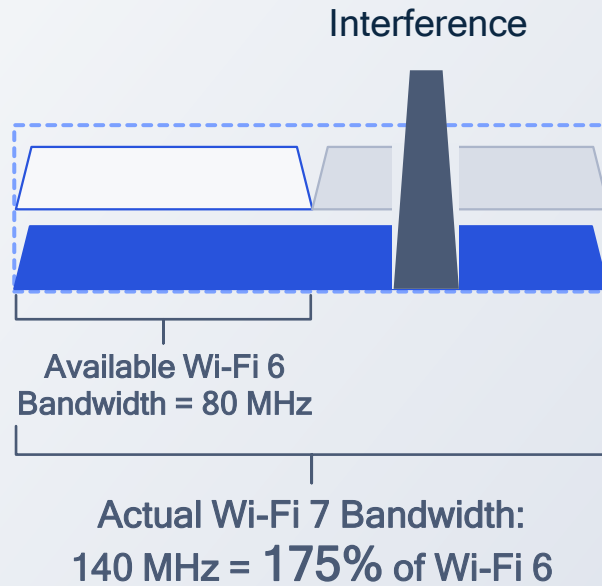
Alternating Multi-Link



Wi-Fi 7 brings conventional improvements
and innovative enhancements

Adaptive Interference Puncturing

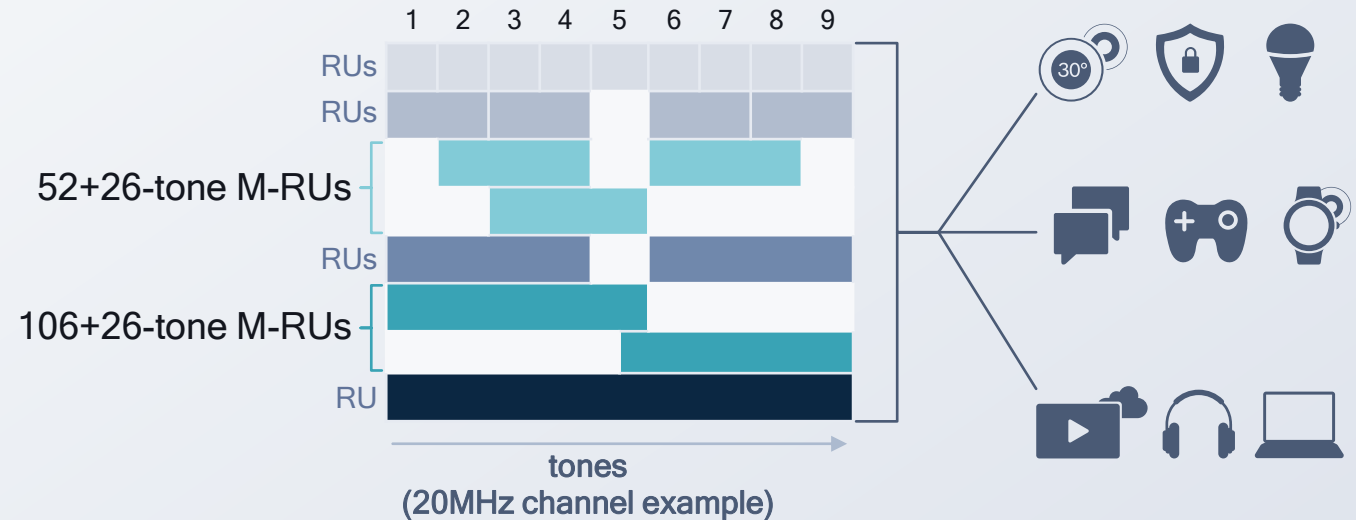
Create a wider channel around the interference rather than a narrower channel that avoids it



Multi-Resource Unit (M-RU) OFDMA

Multiple RUs can be allocated to the same client

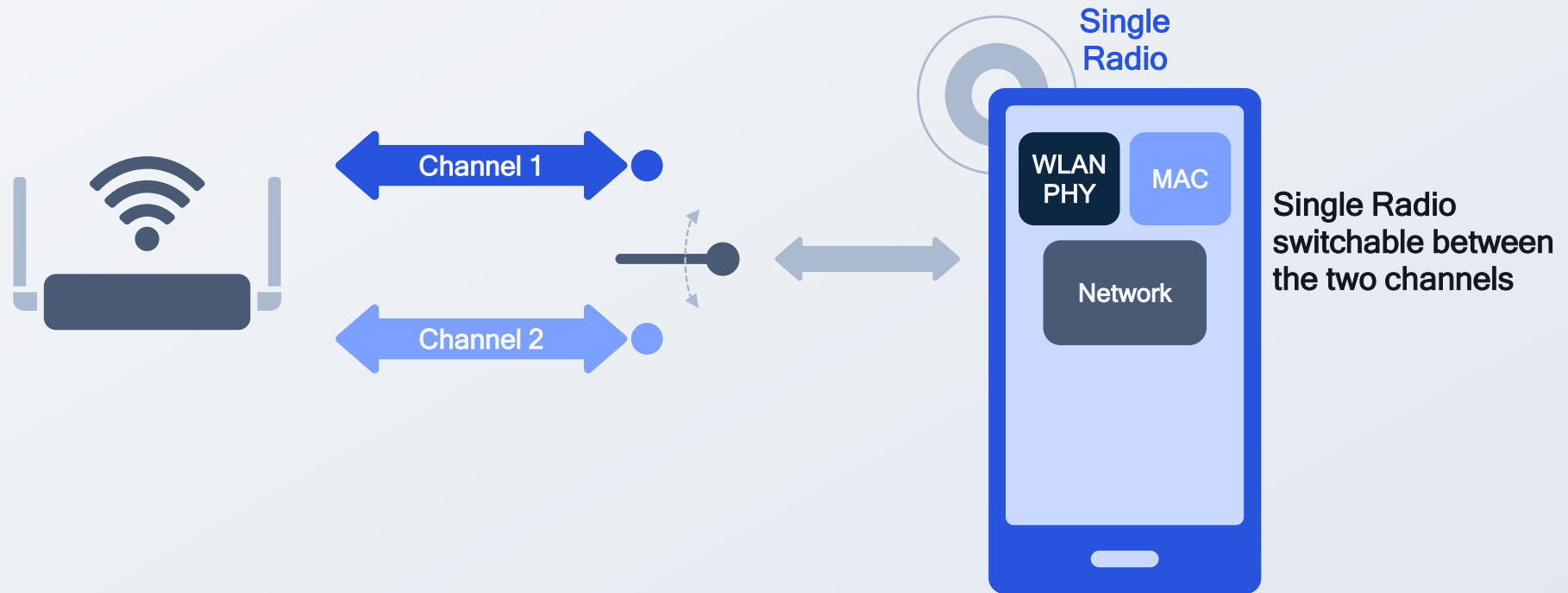
M-RUs increase AP flexibility to assign required throughput at minimum latency to more devices



Adaptive connections enable
higher speed and lower latency

Wi-Fi 7 Single Radio Multi-Link

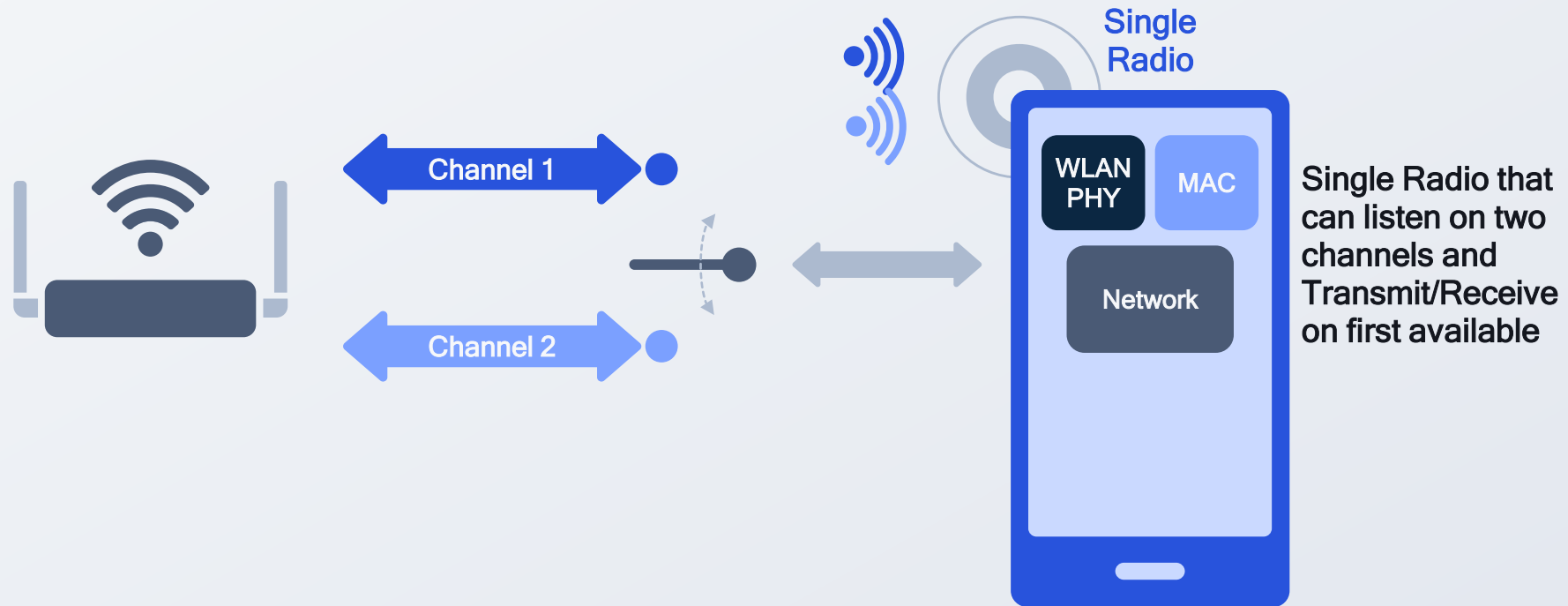
Connect to the AP on two channels, with only one active at a time



Switch channel to adapt to network congestion or client concurrency

Wi-Fi 7 Alternating Multi-Link

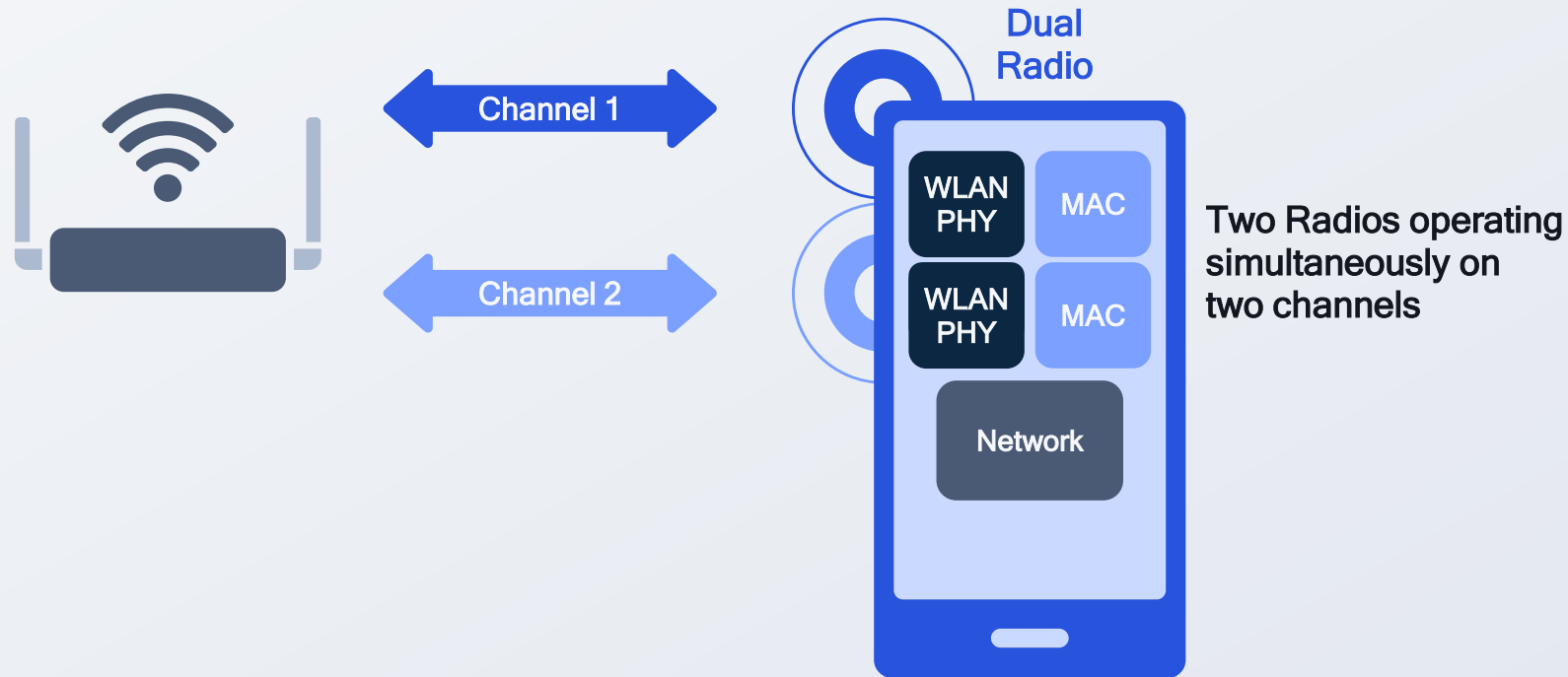
Connect to the AP on two channels, both active but use one at a time



Use first link available to avoid congestion and lower latency

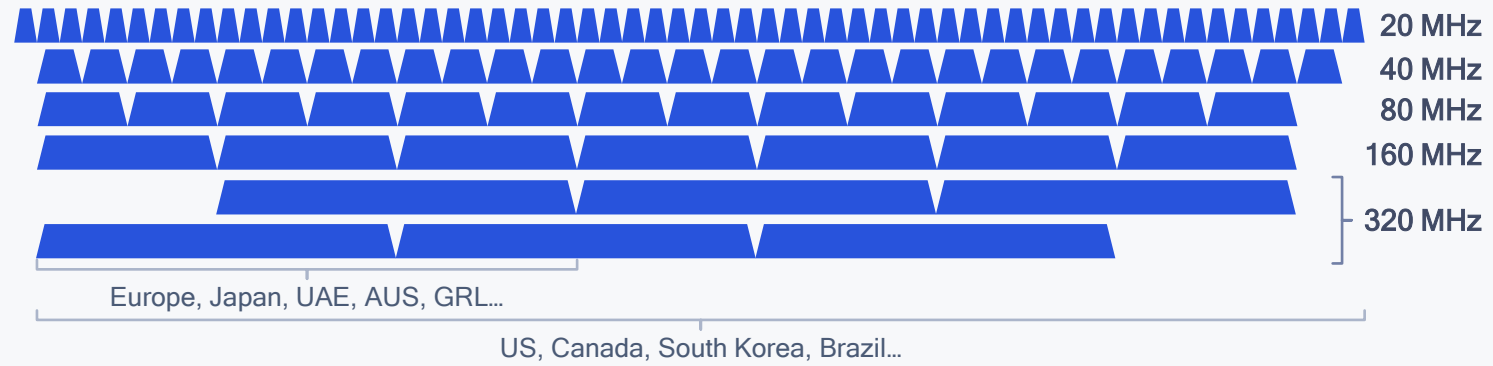
Wi-Fi 7 Simultaneous Multi-Link

Connect to the AP on two channels, use simultaneously enabling maximum throughput

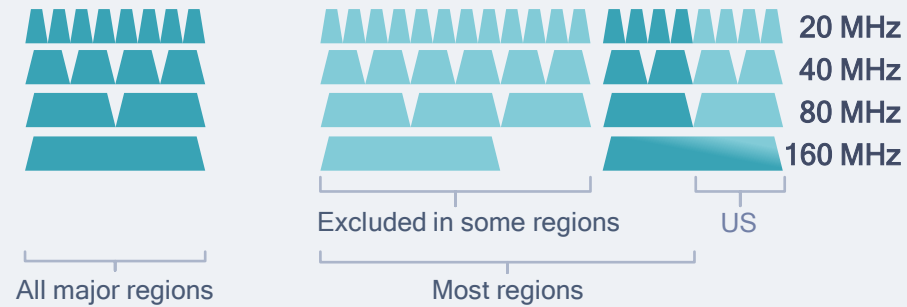


Use both links as available to avoid congestion,
minimize latency and maximize speed

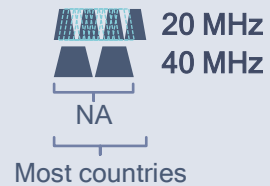
6 GHz¹



5 GHz¹

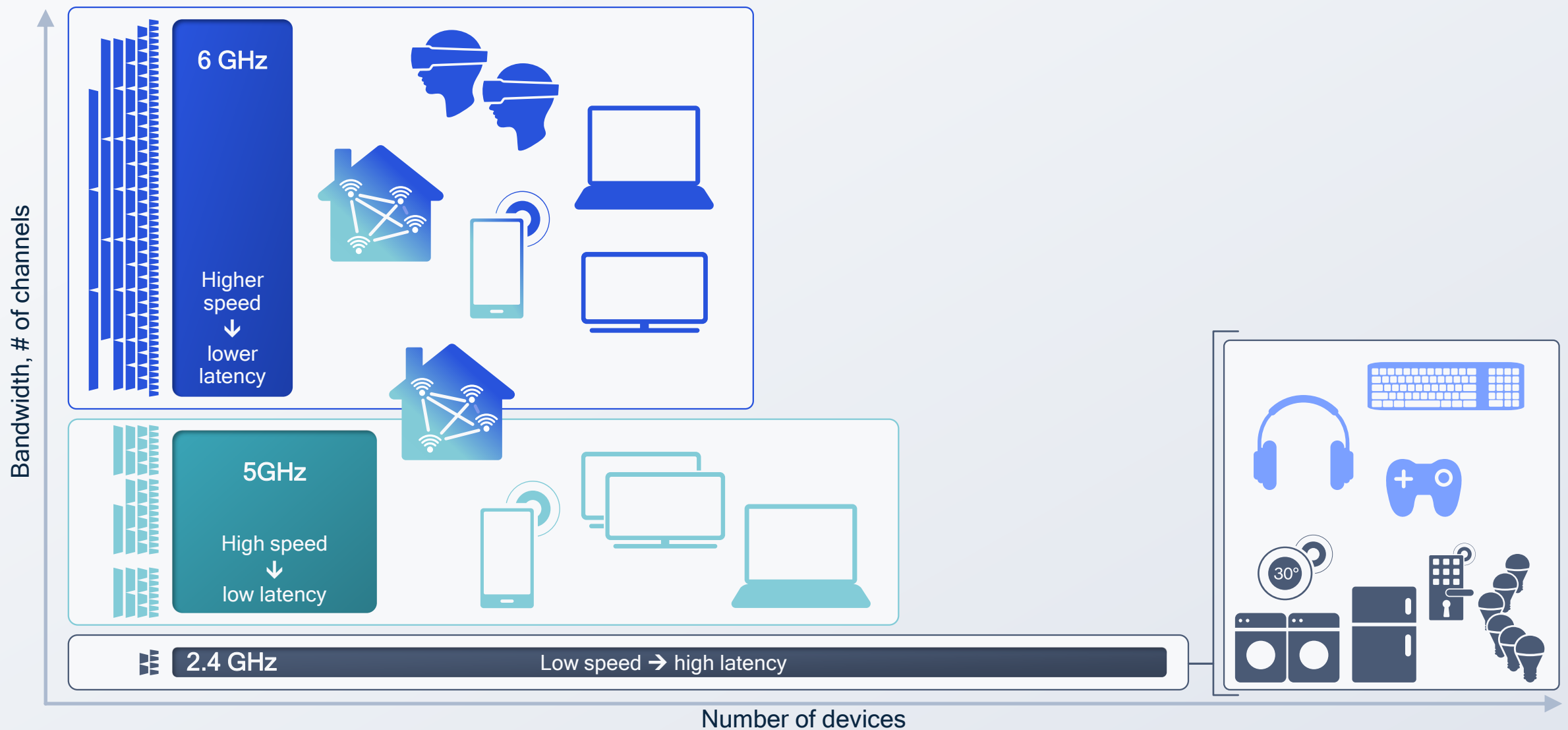


2.4 GHz¹

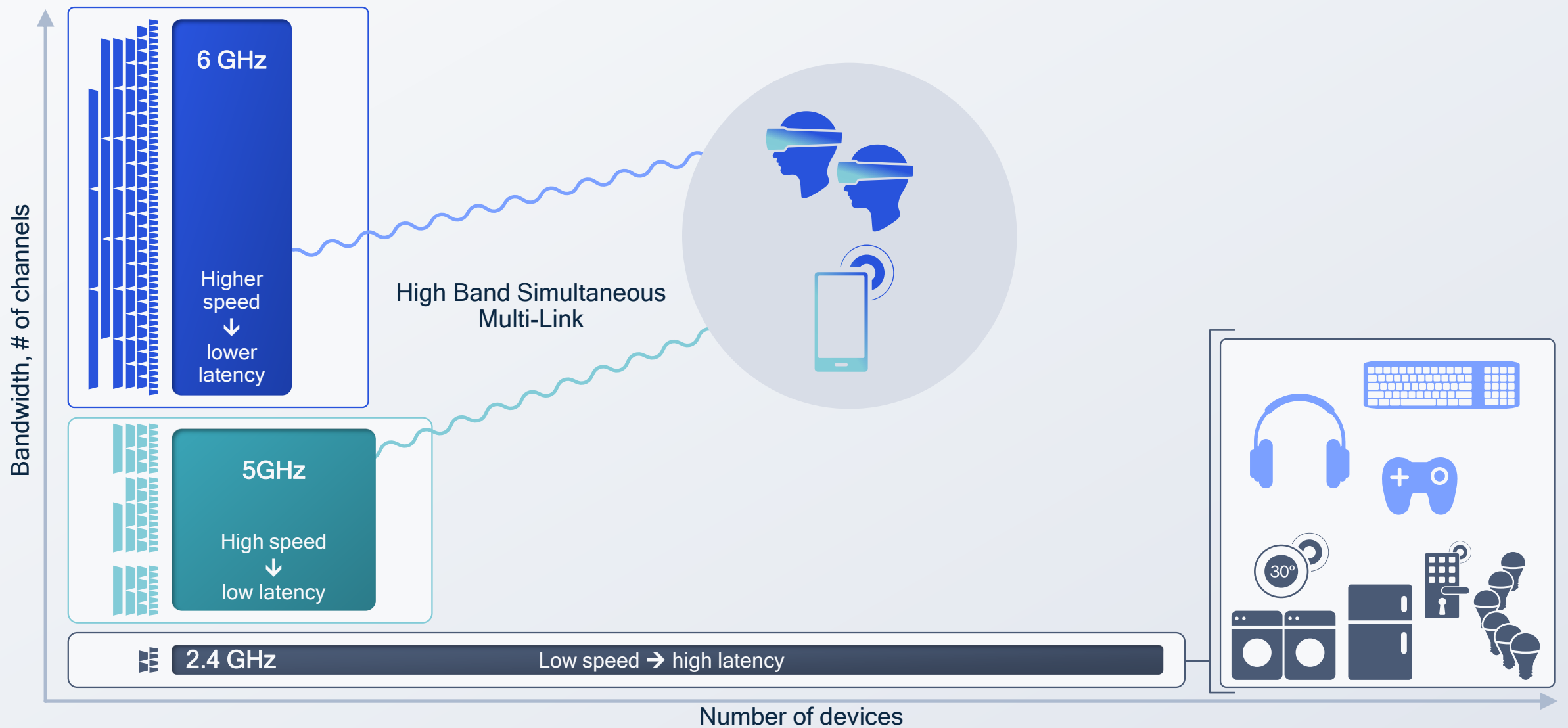


¹Available spectrums are subject to change

Spectrum availability for Wi-Fi varies around the world

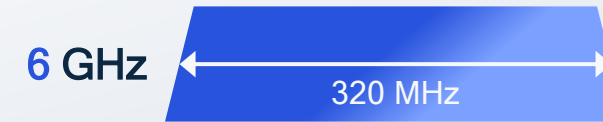
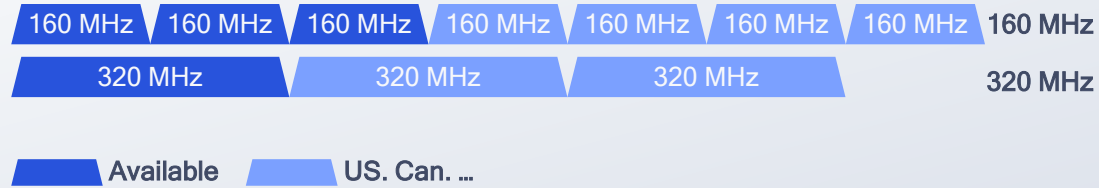


High band connections deliver required service and frees-up the low band for IoT and Bluetooth

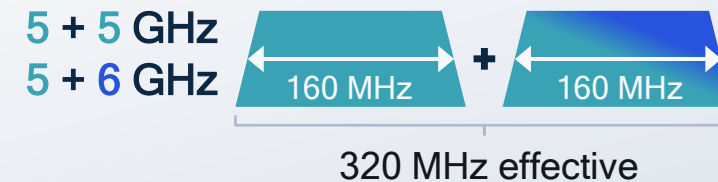


HBS Multi-Link provided multi channel access capabilities

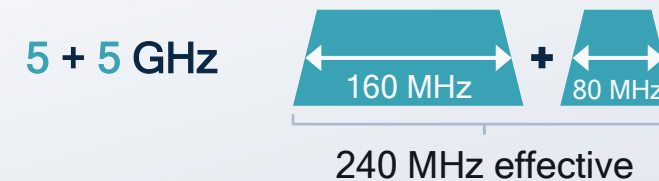
Regions with 6 GHz available



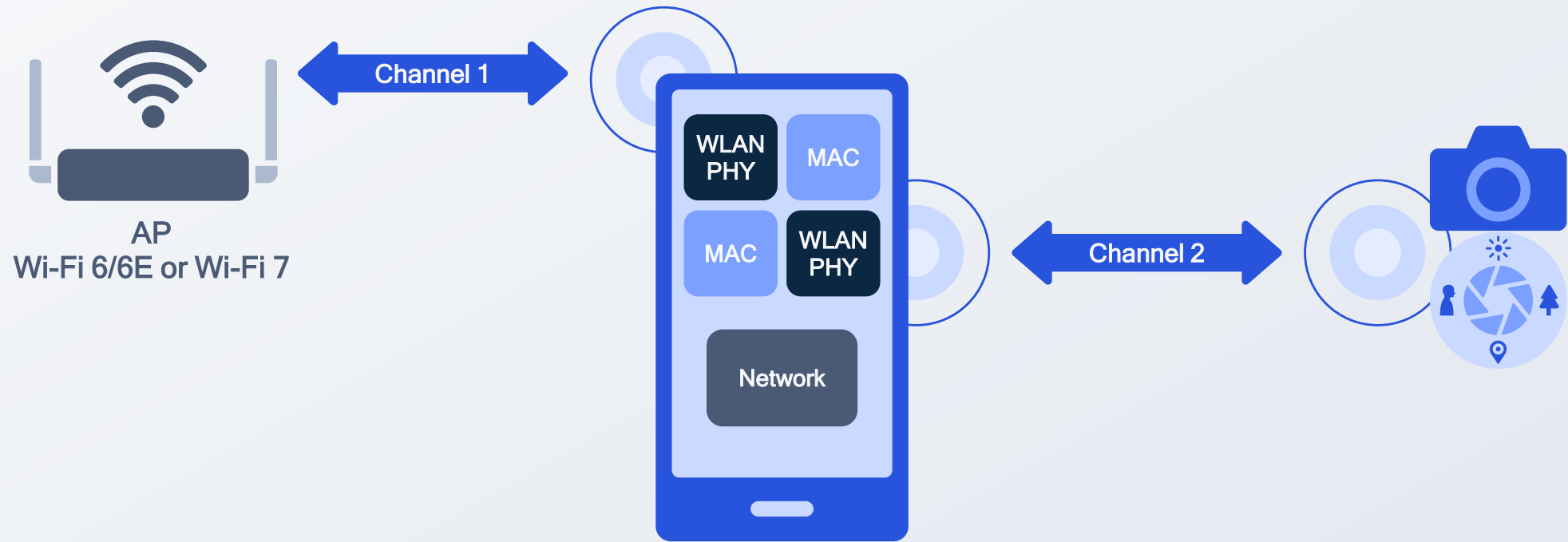
5 GHz Most of the world + US



Regions with one 160 MHz channel @ 5 GHz



Wi-Fi 7 HBS ML offers many paths to
Extremely High Throughput - Globally



HBS Multi-Link enables multiple connections
unlocking advanced use cases



LAB 337



Reminder

Test meeting in the lab.



Grant Card

My Card has a new version of the powerpoint.



Jay.Lee@work.com



Online



Jay Lee

Learn about data in time, space and
addressing, and its current tempo
rations in space and time.



Industrial operation



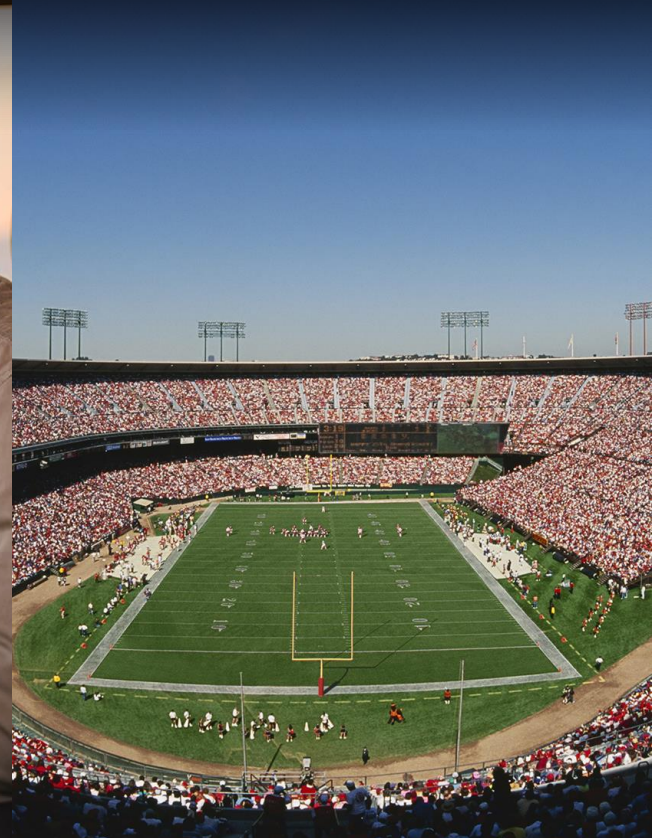
Whole home mesh systems



Wireless ISP



Stadium and outdoor venues



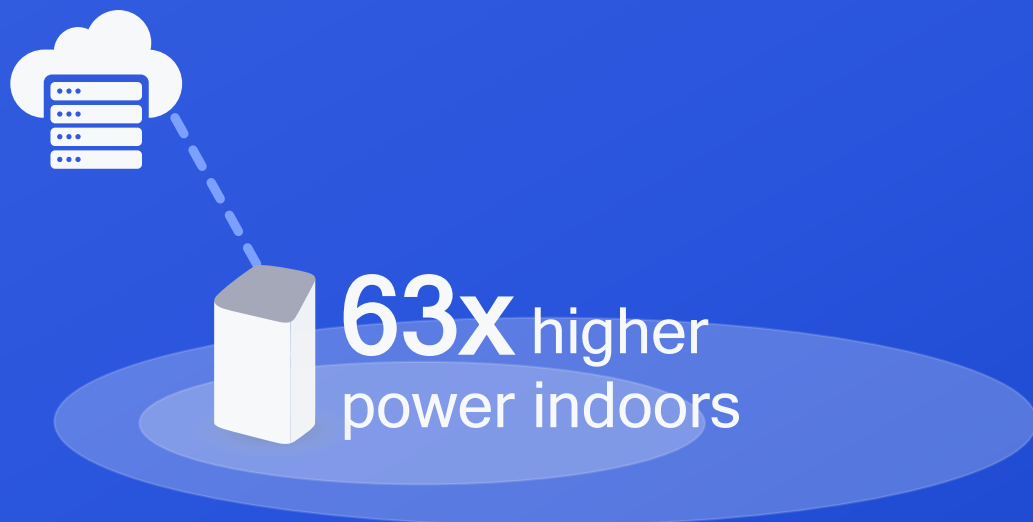
AFC increases performance and enables
new use cases for 6 GHz spectrum

63x higher
power indoors

Outdoor
operations

Weatherized
enclosure

AFC: High-performance and outdoor operation



AFC system requirements



AFC
enabled
device



AFC
cloud



Geolocation



Management



Conditionally approved
for operation by FCC*

Countries evaluating AFC like solutions:

Brazil, Saudi Arabia, Australia,
South Korea, Japan, Europe,...

*FCC conditional approval is to enable standard power for unlicensed devices in the 6 GHz band

Qualcomm Technologies' standards and technology leadership

Inventing breakthrough technologies

\$81+ billion
in cumulative R&D

140,000+
Patents, patent applications



Leveraging 30+ years of cellular and
20+ years of Wi-Fi technology leadership

Leading expertise and long history of world-firsts in prototypes
and technology demonstrations



Driving the evolution of Wi-Fi technology in

- 802.11 working groups through quality contributions and leadership positions in working/task groups
- Wi-Fi Alliance (WFA) through contributions and leadership



+6.5 Billion

Wi-Fi products shipped since 2015²

#1 In global
Wi-Fi
shipments³

Qualcomm Technologies is paving the way
for the future of wireless connectivity

1. Company data as of Q4 FY22; R&D is cumulative expenditures since 1985

2. Internal data

3. ABI Research, Wireless Connectivity Technology Segmentation and Addressable Markets - 3Q 2022 (MD-WCMT-189)

Qualcomm Technologies' Wi-Fi 7 scalable product platforms & turnkey solutions

Qualcomm® FastConnect™ 7800 Mobile Connectivity System full featured Wi-Fi

5.8 Gbps¹
Peak Wireless speed


2ms¹ sustained
latency



Qualcomm® Immersive Home Wi-Fi 7 purpose built for the home


Mesh
Multi-Link




Tri-Band
6 and 10
streams



Qualcomm® Networking Pro Series professional-grade networking, engineered for massive deployments

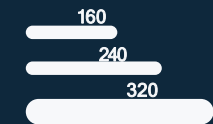
500+
Users¹
User capacity
per channel




Quad-Band
up to 16
streams



Common features



Wider Channels



HBS Multi-link



4k QAM



Adaptive interference
puncturing



Adaptive
Channels



OFDMA

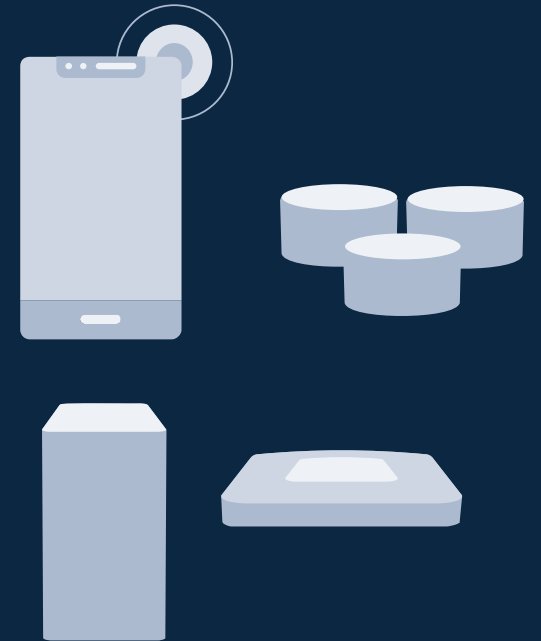


AFC

Wi-Fi 7 market penetration will grow rapidly



Wi-Fi 7 CAGR (2023 - 2027) = 87%



Summary

Wi-Fi 7



Designed to provide faster connections,
consistent lower latency
and improved network robustness

High-Band Simultaneous Multi-Link



Designed to support
wire-like performance

Qualcomm Technologies' AP and client platforms



Hardware and software
optimized turn-key solutions

Wi-Fi 7 – unlocking the next level of Wi-Fi performance

Thank you



Follow us on:     

For more information, visit us at:

qualcomm.com & qualcomm.com/blog

Nothing in these materials is an offer to sell any of the components or devices referenced herein.

©2018-2023 Qualcomm Technologies, Inc. and/or its affiliated companies. All Rights Reserved.

Qualcomm and FastConnect are trademarks or registered trademarks of Qualcomm Incorporated. Other products and brand names may be trademarks or registered trademarks of their respective owners.

References in this presentation to "Qualcomm" may mean Qualcomm Incorporated, Qualcomm Technologies, Inc., and/or other subsidiaries or business units within the Qualcomm corporate structure, as applicable. Qualcomm Incorporated includes our licensing business, QTL, and the vast majority of our patent portfolio. Qualcomm Technologies, Inc., a subsidiary of Qualcomm Incorporated, operates, along with its subsidiaries, substantially all of our engineering, research and development functions, and substantially all of our products and services businesses, including our QCT semiconductor business.