Extremely High Throughput, and Coolness!

Meet your RUCKUS Team

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Wi-Fi 7 Updates*

*At least as they exist today, subject to change.

September 2023

Chris Ruozzo
Systems Engineer – OH KY

Branden Shaulis
Systems Engineer – Midwest

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Wi-Fi 7 Enhancements

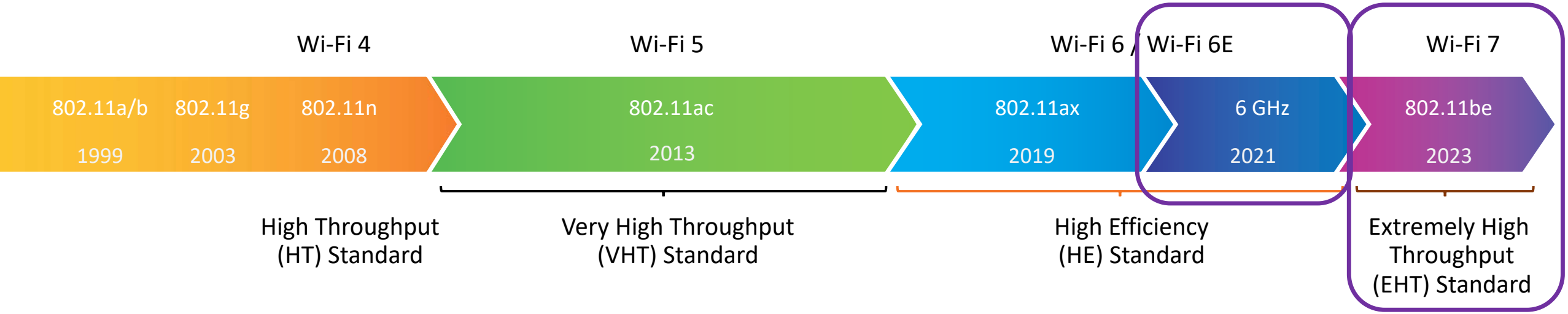
Evolving from speed to capacity and predictability

Wi-Fi First Gen — The first 10 billion devices

Wi-Fi Next Gen — The next 20 billion devices

Peak data rates, aggregate throughput
Under ideal conditions

Network efficiency and capacity
Under real-world conditions
Improve average & worst-case performance



Wi-Fi 6 vs. Wi-Fi 6E vs. Wi-Fi 7 Comparison

Attribute	Wi-Fi 6	Wi-Fi 6E	Wi-Fi 7
Specification Status	September 2020*	January 2021	Draft 2.0 (May 2022) Final (Mar 2024?)
Freq Bands supported	2.4, 5 GHz	2.4, 5, 6 GHz	
Maximum Spatial Streams	8x8		16x16
Highest Modulation	1024 QAM		4096 QAM
Maximum Channel Width	160 MHz		320 MHz
Max PHY Rate	9.6 Gbps		46.1 Gbps
Potential CPE Throughput (4x4) – Good Put	4.4 Gbps		9.6 Gbps

Wi-Fi 7 and Beyond

Standard	Marketing Term	Released	Ratified
802.11a	Wi-Fi 2*	Jan 2000	1999
802.11b	Wi-Fi 1*	Jun 1999	1999
802.11g	Wi-Fi 3*	Jan 2003	June 2003
802.11n	Wi-Fi 4	Mar 2008	Oct 2009
802.11ac	Wi-Fi 5	May 2012	Dec 2013
802.11ax	Wi-Fi 6	Sep 2019	Sep 2020
802.11be	Wi-Fi 7	Q4 2023	2024*
802.11bn	Wi-Fi 8	2027/2028*	2028/2029*
802.11 *tbd*	Wi-Fi 9	2031/2032*	2032/2033*

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New use cases and requirements

Low latency, affected by:

Distance

Speed

Media Contention

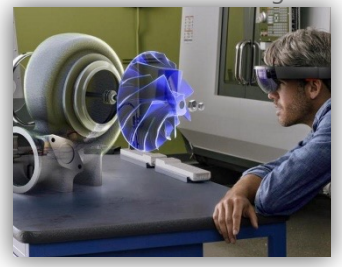
Reliability

High speed

- Extended reality (AR/VR)
- Post pandemic Video Conferencing explosion
- Social Gaming & Esport
- 8K Streaming
- Operational Technology

Remote Research

Collaborative 3D design



Arena gaming

Operational Technology - IoT

Operational Technology - Manufacturing

Major Wi-Fi 7 Enhancements

Extremely High Throughput

Standard	Wi-Fi 6/6E	Wi-Fi 7
Max Speed with 1 Spatial Stream	1.2 Gbps	2.9 Gbps
Max Speed with 2 Spatial Streams	2.5 Gbps	5.8 Gbps
Max Speed with Max # of Spatial Streams	9.6 Gbps	46.4 Gbps

Punctured Transmission

- Increased channel availability
- Better throughput
- Lower latency

Multi-Link Operation

Enhanced Quality of Service

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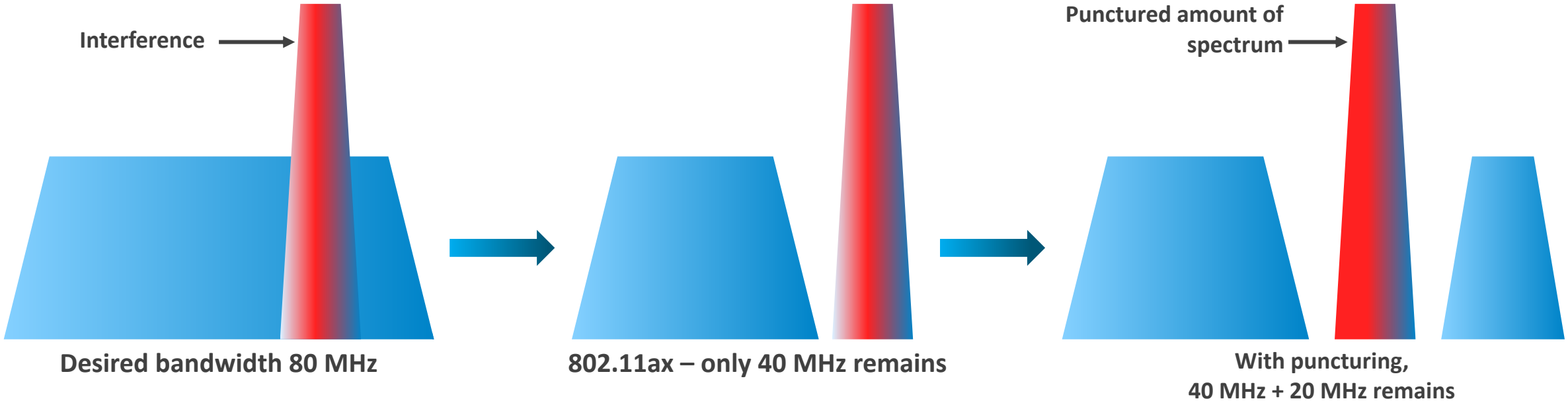

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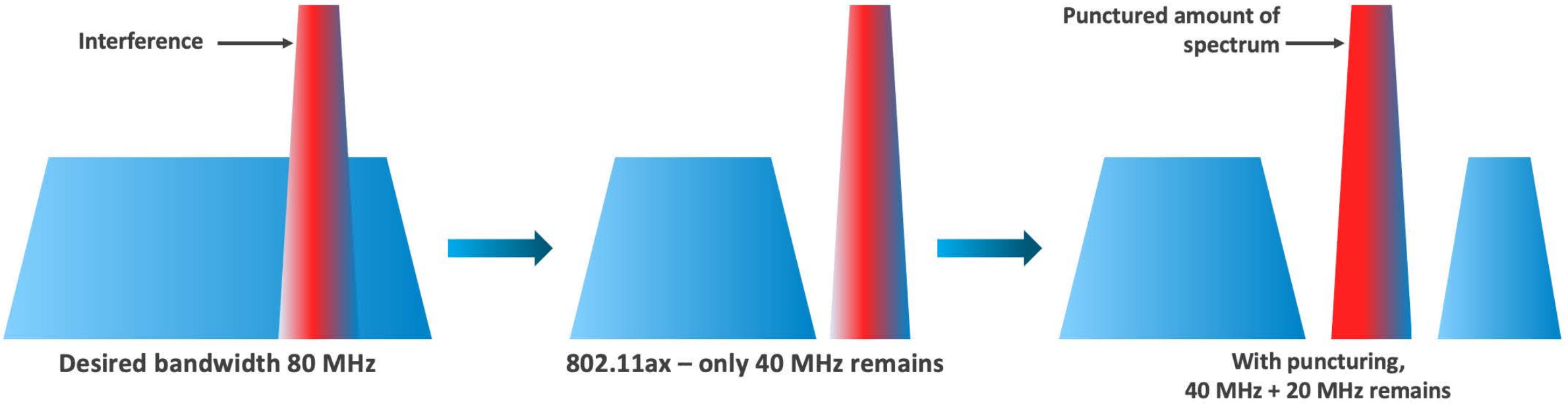

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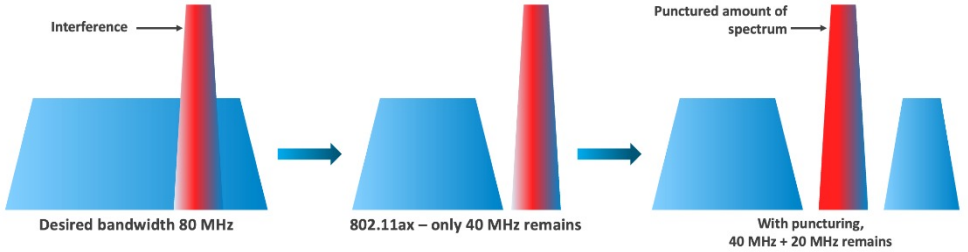

Multi-Link Operation

- Link redundancy (resilience)
- Link aggregation (throughput)
- Link selection (latency)

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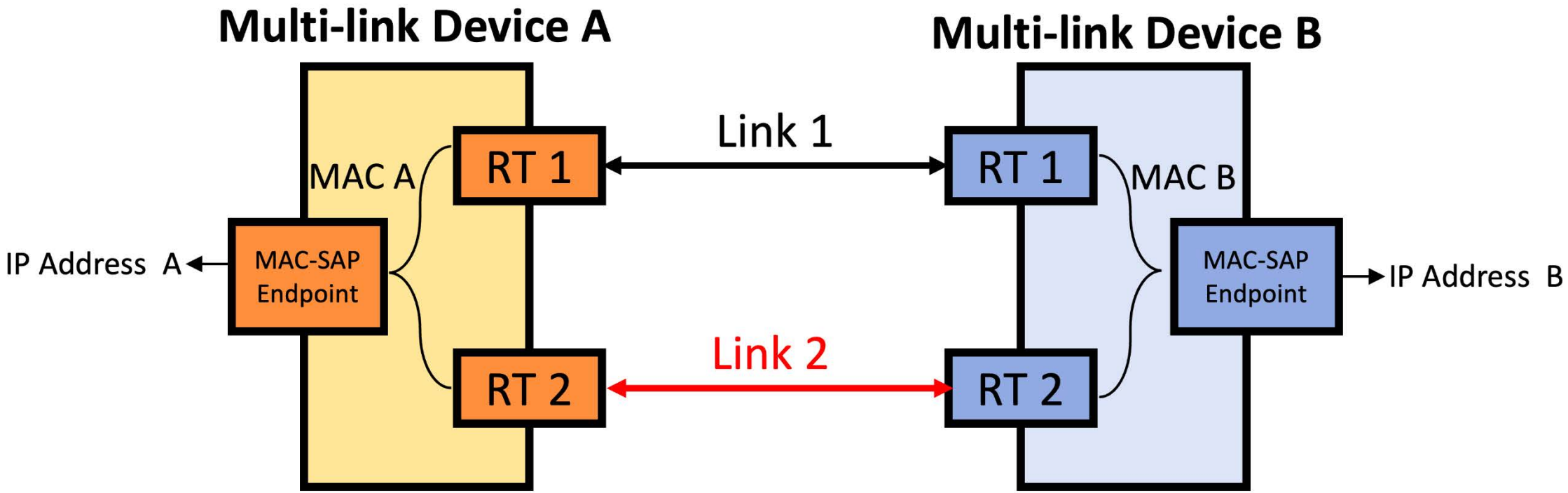

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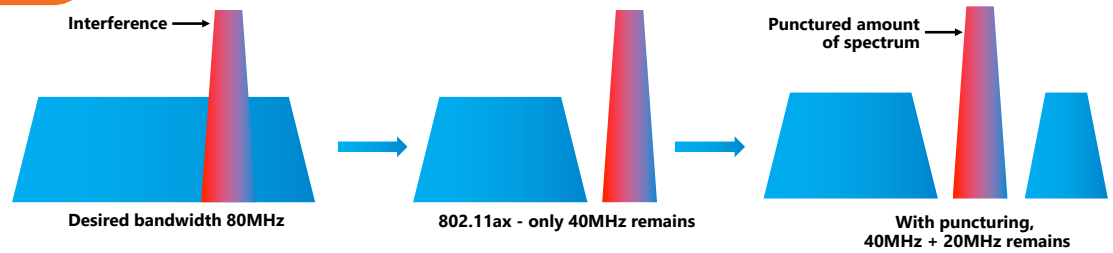

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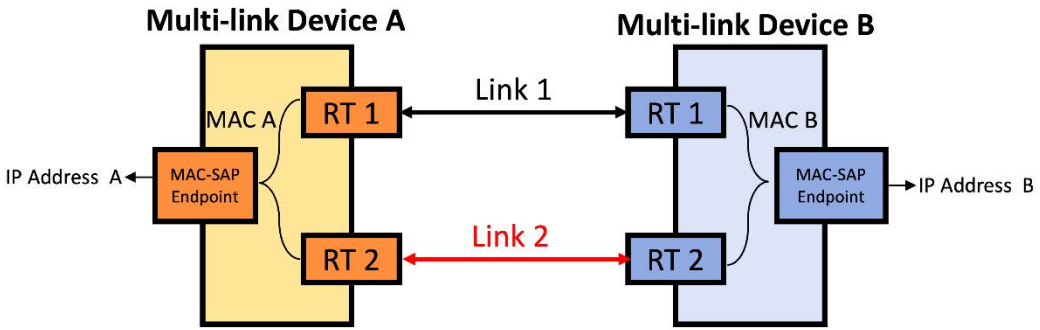

Enhanced Quality of Service

- Time Sensitive Networking (TSN)
- Deterministic Low Latency

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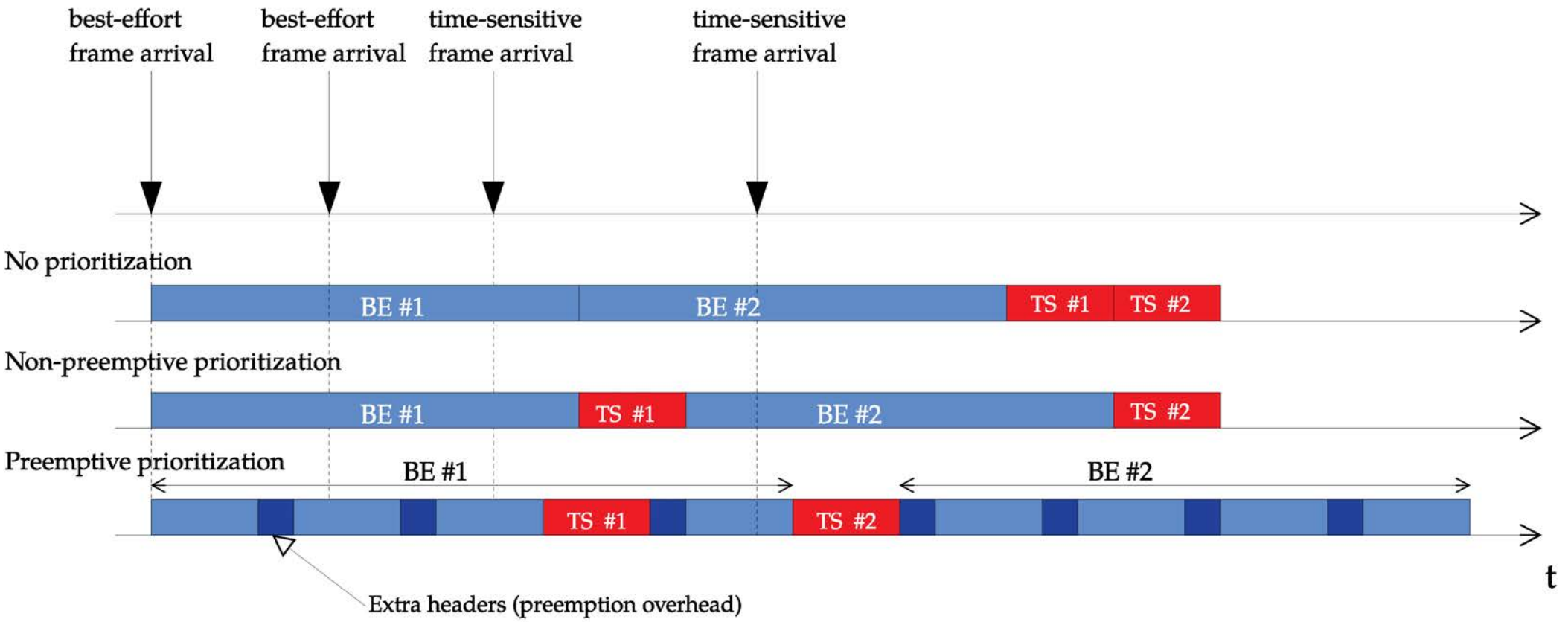

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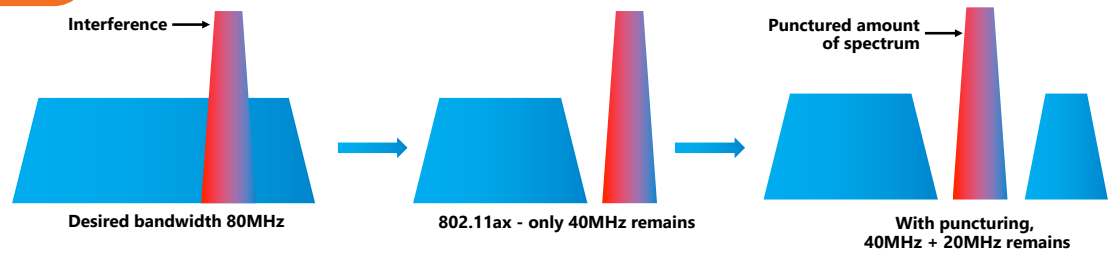

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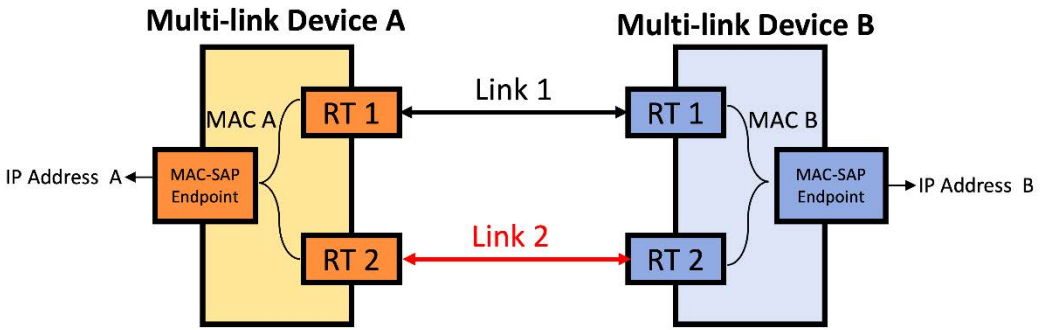

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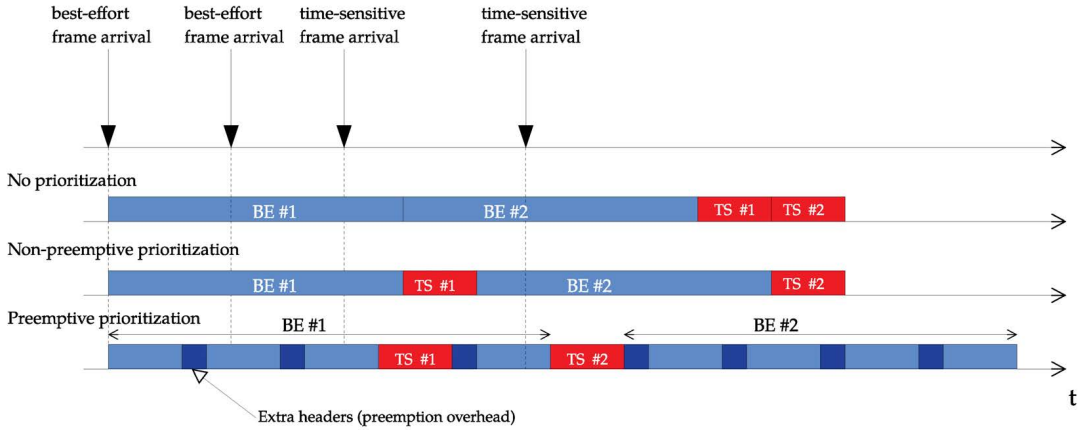


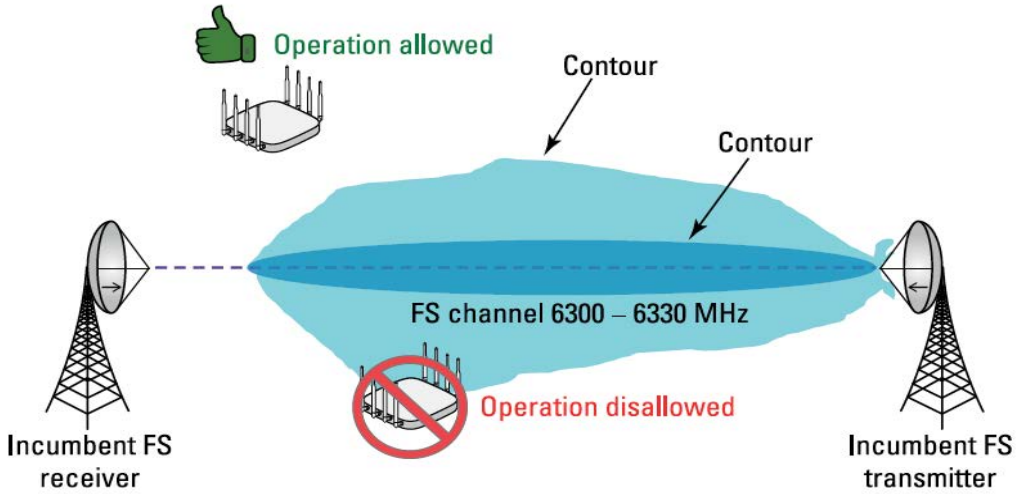
Improved 6 GHz usage

Operating with incumbent services

Standard Power Devices
Low Power Indoor Devices

	Device Class	Operating Band	Max EIRP
U.S	LPI Indoor AP	U-NII-5 to U-NII-8 5.945-7.125GHz	30dBm
	Client connected to LPI AP		24dBm
	Standard Power AP (controlled by AFC)	U-NII-5(5.925-6.425GHz) U-NII-7(6.525-6.875GHz)	36dBm
	Client connected to SP AP		30dBm
	Device Class	Operating Band	Max EIRP
E.U	LPI Indoor AP	U-NII-5 only 5.945-6.425MHz	23dBm
	Client connected to LPI AP		17dBm

Automated Frequency Coordination (AFC)



Federal Communications Commission

Originaly Planned Release Date
December 2022

Currently Planned Release Date
December 2023*

AFC Workflow; *More power to 6GHz*

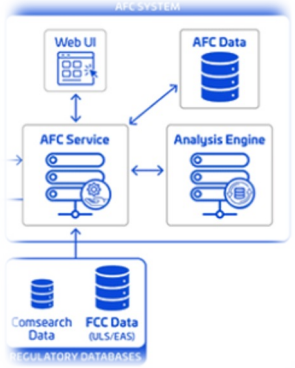
RUCKUS Controller

RUCKUS Cloud™ AFC

AFC Proxy and GeoLocator

4 *RUCKUS AFC Proxy communicates with AFC service*

AFC request/response



Comsearch AFC Service

3 *APs send GPS coordinates, 11mc, location uncertainty, AFC requests…*

5 *Send AFC responses back to the APs*

1 *LPI range and performance*

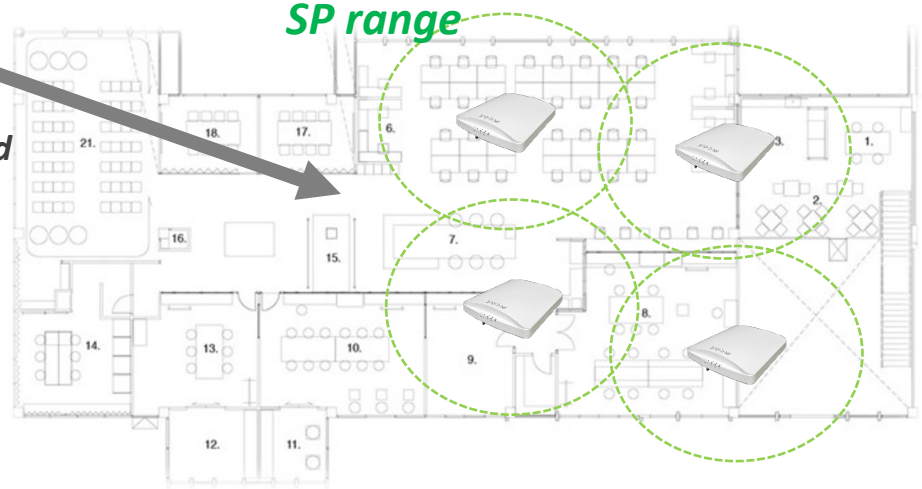
11mc relative distance measurements

2 *External mobile device sets the GPS coordinates for anchor APs.*

RUCKUS 6GHz AP

6 *APs switch to Standard Power 6GHz mode*

SP range

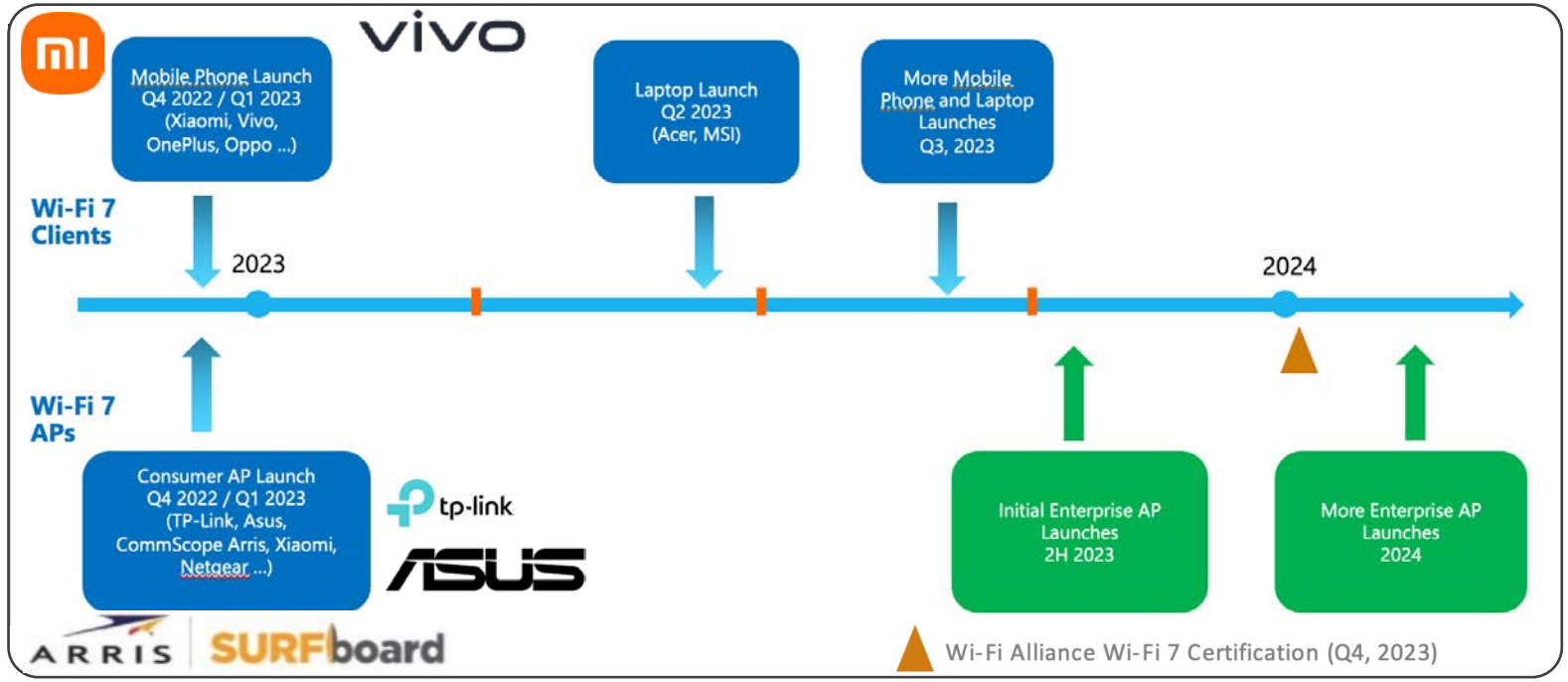


Wi-Fi 7 Ecosystem Timeline

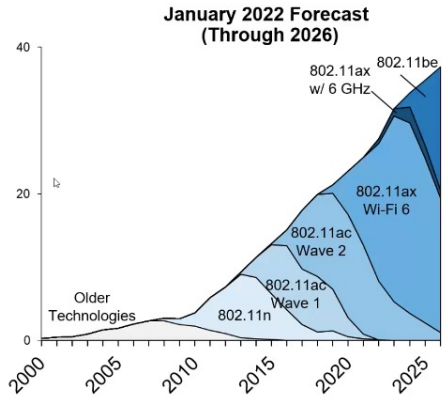
- Clients: Products appear early 2023
- APs: Retail brands appear in 2023
- Enterprise: Expected late 2023

Chipset :

BROADCOM MEDIATEK Qualcomm



Projections :



Dell'Oro Q1'2022 Enterprise WLAN Briefing

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RUCKUS Wi-Fi 7 APs

First Wi-Fi 7 Indoor AP – R770

Public Release Q4 2023

More RUCKUS Wi-Fi 7 Information For Our Customers

RUCKUS Wi-Fi 7 Main Website

https://www.ruckusnetworks.com/solutions/technology/wi-fi-7/

RUCKUS Wi-Fi 7 White Paper

https://www.ruckusnetworks.com/globalassets/digizuite/974720-what-to-know-about-wi-fi-7-wp-117990-en.pdf

RUCKUS Wi-Fi 7 Blog

https://www.ruckusnetworks.com/blog/2023/wifi-7-what-should-you-know/

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Thank You