Introduction: Wi-Fi CERTIFIED 7™

Tony Zeng
2024/06/27

Agenda

- Wi-Fi Alliance®

- Wi-Fi CERTIFIED 7™

- Wi-Fi Alliance Membership

- Wi-Fi® Certification Paths

Wi-Fi Alliance®

WI-FI ALLIANCE VISION:

connecting everyone and everything, everywhere

Our Mission that drive us

Focus area to support our mission

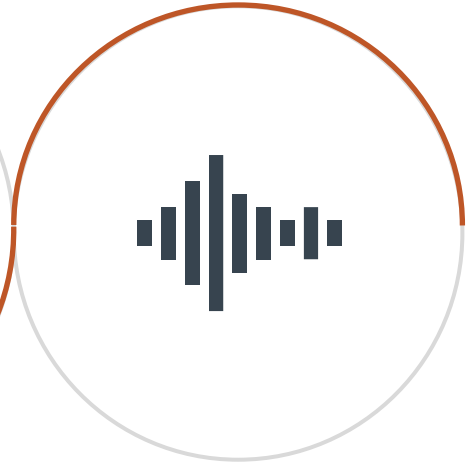Drive next generation technology

Continuously improve quality of service for enhanced user experiences

Ensure consistency, interoperability across devices

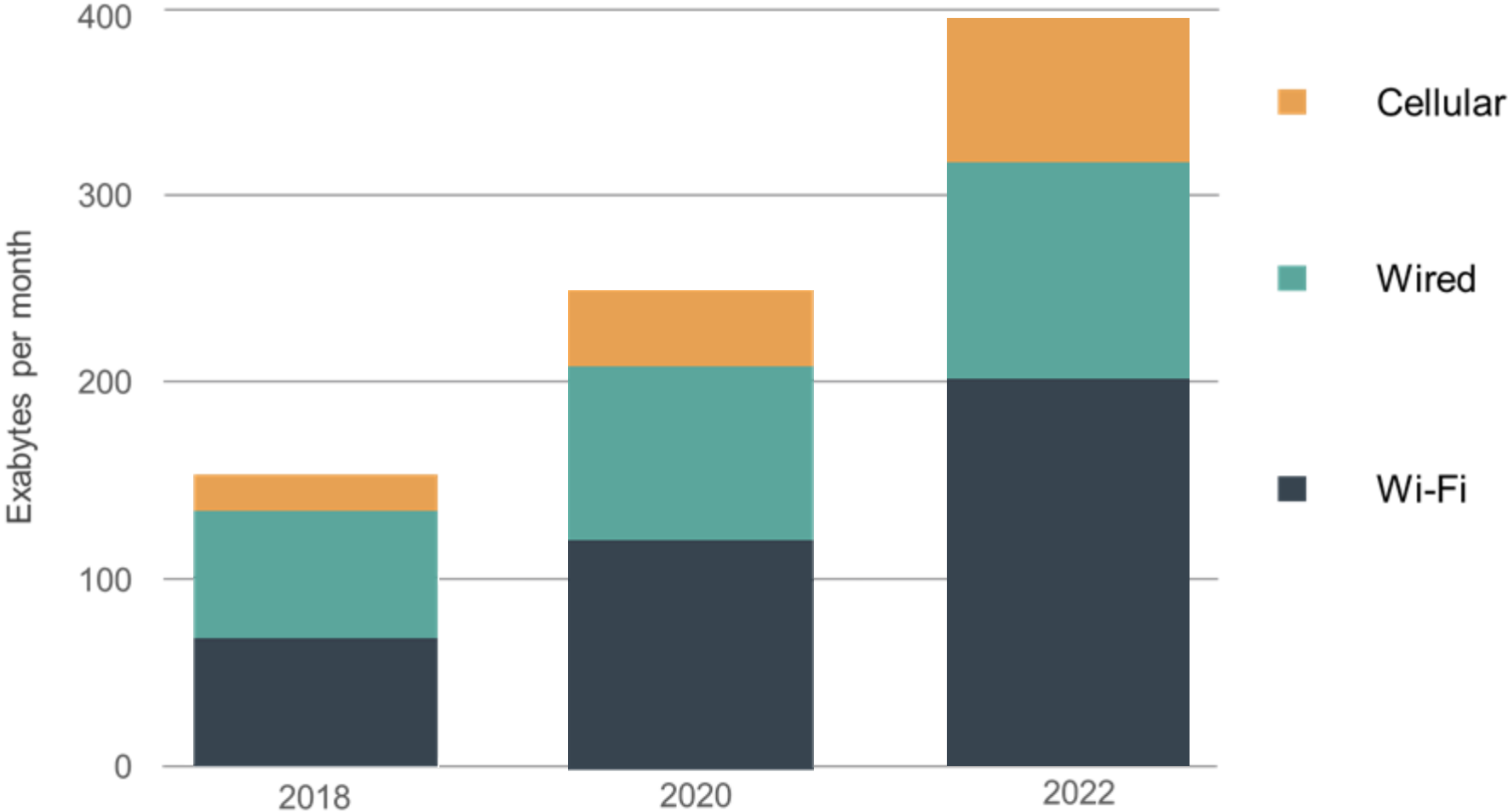Integrate with complementary technologies for seamless connectivity

Ensure global spectrum availability, harmonization

Wi-Fi Alliance draws from a number of sources to define and evolve Wi-Fi

Wi-Fi Alliance technologies

IEEE

Trade associations

Other standards bodies

Wi-Fi global IP traffic surpasses other access technologies

Source: Cisco VNI IP Traffic Forecast, 2017-2022

Wi-Fi® ubiquity drives global connectivity

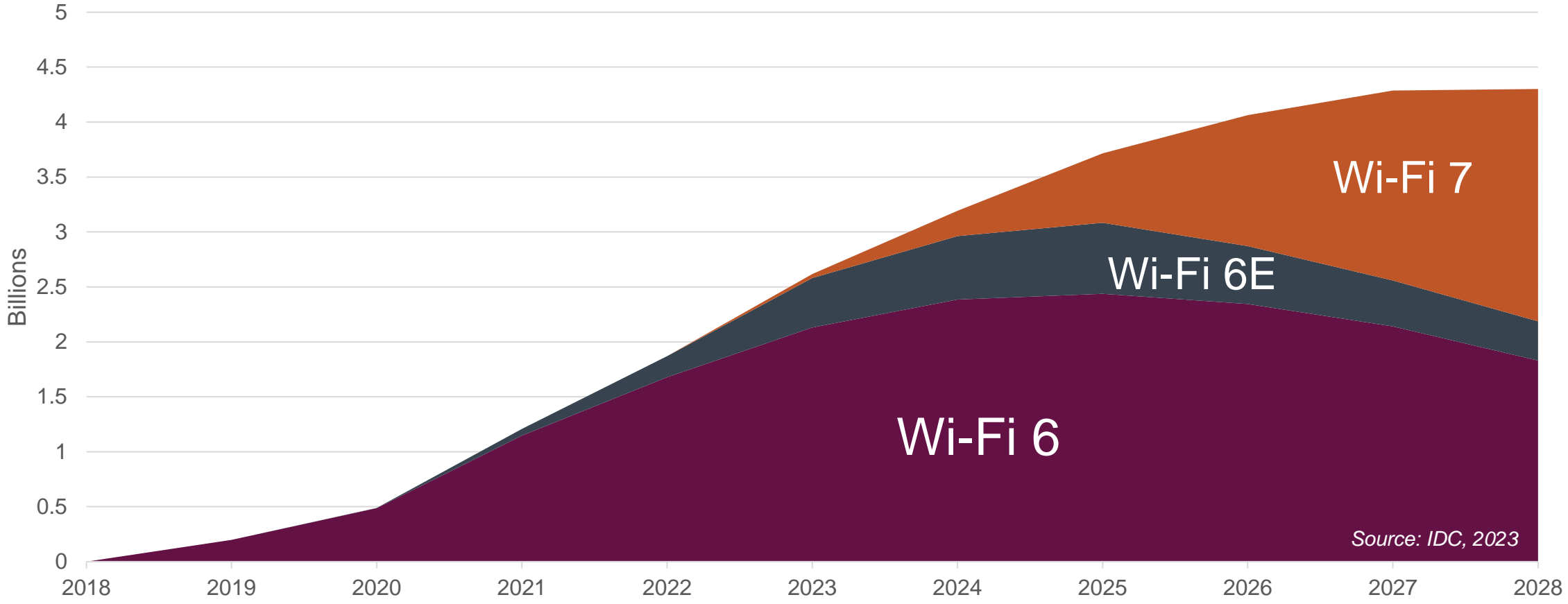| 42 billion	19.5 billion	3.8 billion
Cumulative products	Products in use	New products new year

Source: IDC, January 2023

Wi-Fi 6, Wi-Fi 6E, Wi-Fi 7 adoption

Wi-Fi Shipment Forecast

Wi-Fi 7

Wi-Fi 6E

Wi-Fi 6

Source: IDC, 2023

Wi-Fi Alliance® certification and market-enabling programs

Wi-Fi Alliance® programs			
Wi-Fi (MAC/PHY)		**Security**	**Access**
Wi-Fi CERTIFIED 7™	Wi-Fi CERTIFIED WiGig™	Wi-Fi CERTIFIED WPA3™	Wi-Fi CERTIFIED Passpoint®
Wi-Fi CERTIFIED 6®	Wi-Fi CERTIFIED HaLow™	Wi-Fi CERTIFIED WPA2™	Unsynchronized Solution Discovery
Wi-Fi CERTIFIED™ ac		Wi-Fi CERTIFIED Enhanced Open™	Wi-Fi CERTIFIED Easy Connect™
Wi-Fi CERTIFIED™ n		Protected Management Frames	Wi-Fi CERTIFIED Wi-Fi Protected Setup™
Network Management	**Alternative Topologies**	**Applications**	**Performance**
Wi-Fi CERTIFIED Agile Multiband™	Wi-Fi CERTIFIED Wi-Fi Aware™	Wi-Fi CERTIFIED Miracast™	
Wi-Fi CERTIFIED Data Elements™	Wi-Fi CERTIFIED EasyMesh®	Wi-Fi CERTIFIED Location™	Wi-Fi CERTIFIED Voice-Enterprise
Wi-Fi CERTIFIED QoS Management™ and WMM	Wi-Fi CERTIFIED Wi-Fi Direct™		Wi-Fi CERTIFIED Home Design™
Wi-Fi CERTIFIED Optimized Connectivity™	Tunneled Direct Link Setup		Wi-Fi CERTIFIED Data Elements™
Wi-Fi CERTIFIED WMM-Admission Control			Wi-Fi® Device Metrics

https://www.wi-fi.org/certification/programs

Wi-Fi CERTIFIED 7™

Wi-Fi CERTIFIED 7™

Driving the next level of Wi-Fi® performance

- Wi-Fi CERTIFIED 7 enhances Wi-Fi performance in the 2.4 GHz, 5 GHz and 6 GHz based on IEEE 802.11be

- Cutting-edge capabilities to enable innovations that require high throughput, lower latency, and greater reliability across home, enterprise, and industrial environments

- Key applications include AR/VR/XR, immersive 3D training and ultra high-definition video stream

- Key benefit include:
  - Higher throughput
  - Improved support for deterministic latency
  - Enhanced efficiency
  - Increased robustness and reliability
  - Reduced power consumption

Wi-Fi 7 target use cases

Streaming ultra-high definition video

Multi-user AR/VR/XR

Automotive

Hybrid work and rich telepresence

Immersive gaming and entertainment

Emergency Preparedness Communication Services

Industrial Internet of Things

Immersive 3-D training

Video content focus

- Video traffic is the dominant type of traffic in the majority of WLAN deployments

- Video traffic over WLAN networks is expected to grow at 29% CAGR through 2030 (Cisco: Annual Internet Report, 2020)

- The proliferation of TVs, phones and cameras supporting 8k video (data rate of 20 Gbps) will demand stringent performance and latency requirements beyond Wi-Fi 6

- Applications such as VR/AR/XR and real-time gaming have stringent performance and latency requirements (i.e., <5 ms latency for real-time gaming)

- Satisfying these data rate and low latency requirements will require performance levels that can be best delivered by Wi-Fi 7 in the 6 GHz band

Comparison of Wi-Fi 4, Wi-Fi 5, Wi-Fi 6 and Wi-Fi 7

Parameter	Wi-Fi 4	Wi-Fi 5	Wi-Fi 6	Wi-Fi 7	Benefits of Wi-Fi 7
Bands	2.4 GHz, 5 GHz	5 GHz	2.4 GHz, 5 GHz, 6 GHz	2.4 GHz, 5 GHz, 6 GHz	Designed for 6 GHz from the ground up, increasing capacity and supporting next-generation use cases
Channel Widths	40 MHz, 20 MHz	160 MHz, 80 MHz, 40 MHz, 20 MHz	160 MHz, 80 MHz, 40 MHz, 20 MHz	320 MHz 160 MHz, 80 MHz 40 MHz, 20 MHz	Doubles the size of the widest Wi-Fi 6 channel and makes 160 MHz mandatory to support high-speed use cases
Highest Modulation	64-QAM	256-QAM	1024-QAM	4096-QAM	20% higher transmission rate than Wi-Fi 6's 1024-QAM, enabling higher transmission efficiency for better streaming and low gaming lag
Multi-Link Operation	N	N	N	Y	Over three times higher throughput than Wi-Fi 6
Max Data Rate	600 Mbps	3.5 Gbps	9.6 Gbps	36 Gbps (tri-link MLO)* 23 Gbps (single link)	
Max Spatial Streams	4	4	8	8	Service devices simultaneously and achieve general efficiency
Uplink Channel Access	Enhanced Distributed Channel Access (EDCA)	EDCA	EDCA Trigger access	EDCA Optimized trigger access	More predictable latency with lower overheads

* For 320 MHz in 6 GHz, 160 MHz in 5 GHz, and 20 MHz in 2.4 GHz

Wi-Fi CERTIFIED 7™ key features

320 MHz channels

Multi-link Operation (MLO)

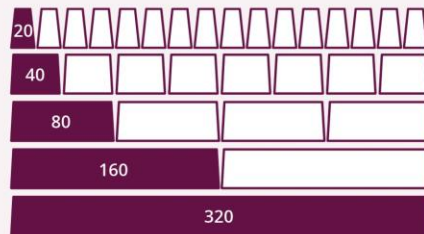Multiple RUs to a single STA

Triggered Uplink Access

Wi-Fi 7™ CERTIFIED

Emergency Preparedness Communication Services

4K QAM

512 Compressed Block Ack

Wi-Fi CERTIFIED 7™ (1/7)

Wi-Fi CERTIFIED 7™ FEATURE SPOTLIGHT

320 MHz Channels

| 20 |
| 40 |
| 80 |
| 160 |
| 320 |

Superwide channels enable multigigabit Wi-Fi device speeds in countries that have opened the 6 GHz band for unlicensed use.

With double the widest channel of Wi-Fi CERTIFIED 6®, 320 MHz channels delivers two times higher throughput.

Wi-Fi CERTIFIED 7™ FEATURE SPOTLIGHT

Multi-Link Operation (MLO)

MLO allows devices to combine different channels across frequency bands together for concurrent transmission and reception of data over multiple links.

MLO allows more efficient load balancing of traffic among links to meet user needs, resulting in increased throughput, lower latency, and improved reliability.

6 GHz
5 GHz
2.4 GHz

Wi-Fi CERTIFIED 7™ (3/7)

Wi-Fi CERTIFIED 7™ FEATURE SPOTLIGHT

Multiple RUs to a single STA

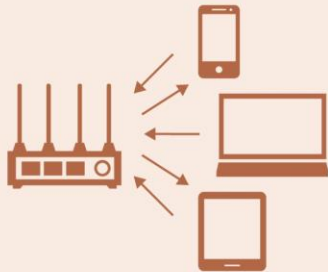| RU1	RU2	RU3
User 1		User 2

Wi-Fi 7 allows multiple resource units (RUs) to be assigned to a single user and can combine RUs for more efficient transmissions.

This improves flexibility for spectrum resource scheduling to further enhance spectrum efficiency.

Wi-Fi CERTIFIED 7™ (4/7)

Wi-Fi CERTIFIED 7™ FEATURE SPOTLIGHT
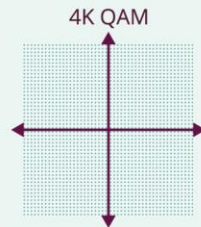
Triggered Uplink Access

Wi-Fi 7 optimizes Wi-Fi 6-defined triggered uplink access scheduling to accommodate uplink latency-sensitive streams.

This optimizes Wi-Fi 6 defined triggered uplink access to accommodate latency sensitive streams and satisfy QoS requirements.

Wi-Fi CERTIFIED 7™ (5/7)

Wi-Fi CERTIFIED 7™ FEATURE SPOTLIGHT

4K QAM

4K QAM

Wi-Fi 7's 4K QAM delivers 20 percent higher transmission rates than Wi-Fi 6's 1024-QAM.

These heightened transmission rates enable greater transmission efficiency to support flawless streaming.

Wi-Fi CERTIFIED 7™ (6/7)

Wi-Fi CERTIFIED 7™ FEATURE SPOTLIGHT

512 Compressed Block Ack

Wi-Fi 7's 512 Compressed block-ack allows the transmitter to aggregate up to 512 MAC protocol data units (MPDUs) in a single frame and allows the receiver to acknowledge up to 512 MPDUs in a single block-ack (BA) frame. This significantly improves efficiency and reduces overhead.

Wi-Fi CERTIFIED 7™ (7/7)

Wi-Fi CERTIFIED 7™ FEATURE SPOTLIGHT

Emergency Preparedness Communication Services

Provides a seamless National Security & Emergency Preparedness (NSEP) service experience to users while maintaining the priority and quality of service in Wi-Fi access networks.

Supports 5G offload to Wi-Fi access to ensure authorized NSEP users can communicate during critical times.

Countries Enabling Wi-Fi in 6GHz

- Website tracker for countries opening 6 GHz spectrum for unlicensed use

- Expanded Economic Value of Wi-Fi study now 29 economies

- Wi-Fi 6E Insights quarterly newsletter – subscribe here

- Published Wi-Fi 6 in China case studies– universities, manufacturing, and citywide deployments

- Wi-Fi 6E in education case study

Legend:
- Adopted 5925-6425 MHz
- Adopted 5925-7125 MHz
- Adopted 5925-6425 MHz, Considering 6425-7125 MHz
- Considering 5925-6425 MHz
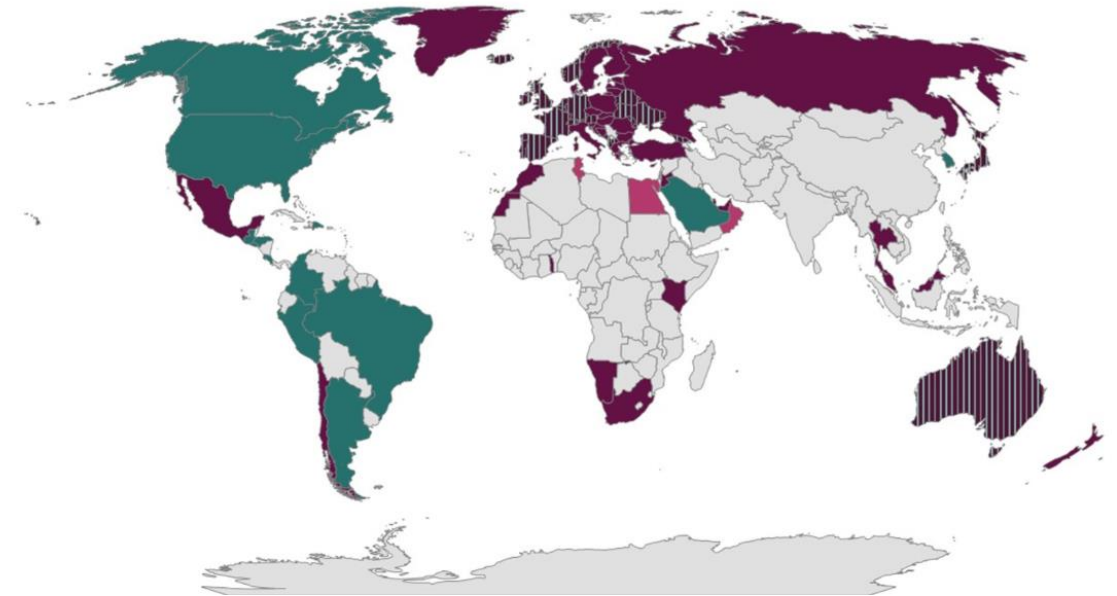
Wi-Fi Alliance Membership

Wi-Fi Alliance membership levels

Contributor Membership

For companies who want to drive the direction of the Wi-Fi industry and develop many Wi-Fi CERTIFIED™ products and use the Wi-Fi CERTIFIED brand

- Develop, test, and certify products
- Use the Wi-Fi CERTIFIED logo and brands for certified devices
- Participate and vote in task groups
- Monitor developing programs
- Extend benefits to affiliate companies
- US $25,000 / year

Implementer Membership

For company who want to implement certified solution in products and use the Wi-Fi CERTIFIED brand

- Implement unmodified Wi-Fi modules to certify devices
- Use the Wi-Fi CERTIFIED logo and brands for certified devices
- Access to all documents such as task group work and more
- US $6,000 / year

Small Business Introductory Membership

Lower introductory rates available for smaller companies who want to experience the benefits of membership as they grow their business

- Participant level: similar to Contributor membership; US $7,725 / year
- Implementer level: similar implementer membership US $2,575 / year
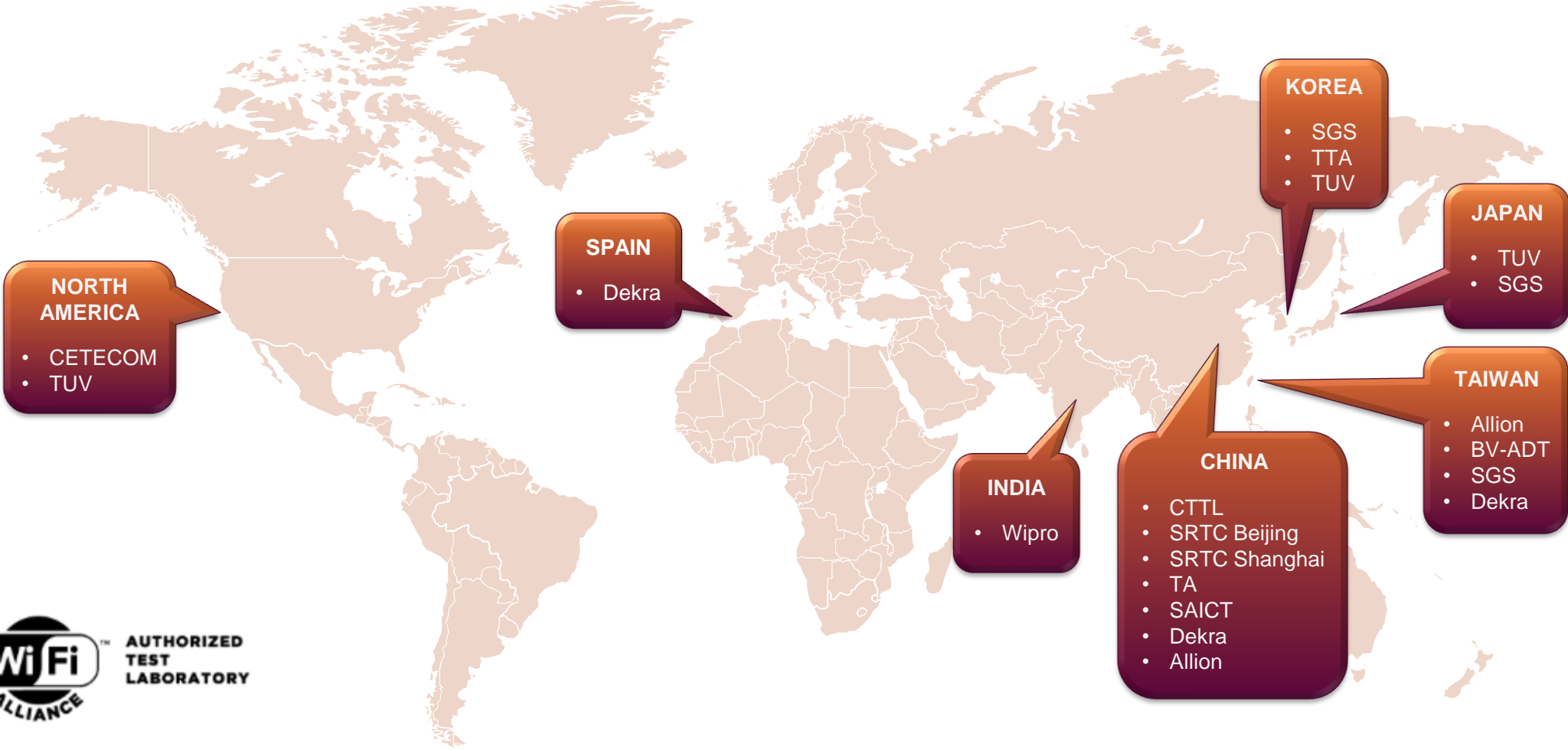
Learn more: membership and membership benefits

Wi-Fi Certification Paths

Wi-Fi certification options

Wi-Fi certification options

	Product candidates	When to use	Where to test
FlexTrack	Highly differentiated products designed from the ground up	Extensive flexibility in Wi-Fi customization and optimization	Completed at an Authorized Test Laboratory (ATL)
QuickTrack	End products are based on a Qualified Solution that has already completed full Wi-Fi functionality testing	Targeted modifications to Wi-Fi components and functionality	Completed at an ATL or member testing site
Derivative	For product portfolios where multiple products use identical Wi-Fi designs	Members apply for certification of derivative products without the testing requirement	None required

Wi-Fi CERTIFIED worldwide network of ATL

KOREA
- SGS
- TTA
- TUV

JAPAN
- TUV
- SGS

SPAIN
- Dekra

NORTH AMERICA
- CETECOM
- TUV

TAIWAN
- Allion
- BV-ADT
- SGS
- Dekra

INDIA
- Wipro

CHINA
- CTTL
- SRTC Beijing
- SRTC Shanghai
- TA
- SAICT
- Dekra
- Allion

Authorized Test Laboratories | Wi-Fi Alliance

Join us to drive the future of Wi-Fi now!

Membership in Wi-Fi Alliance brings together product certification, industry networking, marketing resources, regulatory influence, and an opportunity to **shape the future** of the industry

www.wi-fi.org

tchang@wi-fi.org

+886 2 7728 3291 (Taiwan office)

+886 933 716 191 (Tina's cell phone)

facebook.com/wificertified

@wifialliance

Linkedin.com/company/wi-fi-alliance

@wifialliance官方微博

THANK YOU

Join us to drive the Wi-Fi future

www.wi-fi.org

membership@wi-fi.org

+1 512 498 9434