

Whitepaper

Exploring the potential of Wi-Fi 7

April 2024



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Foreword

In the relentless march of technological progress, the evolution of connectivity services stands out as a uniquely dynamic journey. Wi-Fi has woven itself into the fabric of everyday life for businesses and individuals alike, making its advancements a pivotal focal point.

The economic and social importance of wireless technologies cannot be overstated, and the emergence of Wi-Fi 7 represents the latest milestone in this ongoing narrative. This technology serves as a linchpin, enabling the seamless integration of numerous tools and services that drive modern society forward. Promising faster speeds, enhanced stability, and fortified security, Wi-Fi 7 will propel the industry into a new era of connectivity. With its potential to revolutionise user experiences and unlock new possibilities, Wi-Fi 7 is poised to reshape industries and empower communication service providers.

At the forefront of this technological revolution stands Heights Telecom, poised to empower communication service providers with cutting-edge solutions and unparalleled expertise. Offering industry-leading solutions and support, Heights Telecom enables CSPs to harness the full potential of Wi-Fi 7 and deliver superior internet experiences to their customers.

While its widespread adoption may be on the horizon, the journey towards realising its full potential has only just begun. With unwavering commitment and collaborative efforts, we stand ready to embrace the transformative power of Wi-Fi 7 and usher in a new era of wireless connectivity.

The future is Wi-Fi 7, and together, we embark on this transformative journey.



As Wi-Fi becomes increasingly crucial to the operations of organisations and societies across the globe, it amplifies the need for high-quality products which consistently deliver strong performance and results.

Wi-Fi 7 and the state of the market

As one of the biggest technological advances of the digital age, Wi-Fi has evolved into an indispensable component of everyday life for communities around the world. Used by everyone from individuals and families to governments and other global businesses and organisations, Wi-Fi continues to act as a key contributor to the sustained social and economic growth.

From a financial perspective, Wi-Fi continues to support the development of economies all over the world. According to a study by the Wi-Fi Alliance, the global economic value of Wi-Fi is estimated at \$3.5 trillion USD, which is expected to rise to approximately \$5 trillion by 2025. In line with this, over the last twenty years, the technology has advanced from a 'nice-to-have', to a non-negotiable tool to streamline communication and

improve efficiencies for businesses across the globe.

As Wi-Fi has become increasingly ingrained in society, it has offered continued and substantial benefits to users. Allowing instant communication and the opportunity to access endless online resources at the touch of a button, Wi-Fi has revolutionised the way both individuals and organisations operate. Notably, the technology has been leveraged across almost every sector, including critical functions such as law enforcement, emergency services, and healthcare organisations.

However, as Wi-Fi becomes increasingly crucial to the operations of organisations and societies across the globe, it amplifies the need for high-quality products which consistently deliver strong performance and results.

Introducing Wi-Fi 7

Supporting the need for an improved wireless performance is the introduction of the seventh generation of wireless technology – more



commonly known as, Wi-Fi 7. While following closely in the footsteps of Wi-Fi 6 and Wi-Fi 6E (launched in 2019 and 2020, respectively) Wi-Fi 7 offers a range of new and innovative features which build significantly on the performance of previous wireless technologies.

The need for speed

Increased network speed is one of the key features and primary improvements offered by Wi-Fi 7. This latest iteration of wireless technology provides the faster network speeds that both businesses and consumers have been searching for. Wi-Fi 7 products are expected to have a maximum speed of 46 Gbps, which is approximately, 4.8x the speed of Wi-Fi 6. Whether it's catching up on the latest Netflix series or downloading large files and documents for work, this new, faster Wi-Fi connection will support users across the breadth of their online activities.

A stable connection

In the age of remote work, consumers' home Wi-Fi networks are having to support more devices and network traffic than ever before. As a result, the need for a stable and reliable Wi-Fi connection where end

Wi-Fi 7 products are expected to have a maximum speed of 46 Gbps, which is approximately, 4.8x the speed of Wi-Fi 6.

users can efficiently access all the resources they need, is paramount. As Wi-Fi 7 products operate in a greater bandwidth than previous wireless technologies – doubling the existing bandwidth to 320 MHz – they can allow more devices to be supported across the network.

Enhanced security measures

In an era defined by digital connectivity, cybersecurity now stands up as crucial concern. As connectivity solutions become increasingly ingrained in the fabric of everyday life – particularly amid the growth of 'the smart home' – connected devices will be increasingly at risk. The rise of Wi-Fi 7 looks to address these challenges providing a seamless connection while also fortifying the security infrastructure – offering users peace of mind in an increasingly connected world.

Reliable low-latency performance

The growth of services such as augmented reality and interactive gaming is driving the need for increasingly robust performance among connectivity services. The emergence of Wi-Fi

7 offers a beacon of opportunity for CSPs. With its low-latency performance, Wi-Fi 7 provides minimised delays and rapid data transmission to create a high-quality connectivity experience.

Growth in the market

But how will Wi-Fi 7 fare among the existing wireless technology solutions? Putting this into context, the Wi-Fi Alliance suggests that Wi-Fi 6 has seen strong adoption since its launch, with expectations that product shipments will surpass 5.2 billion by 2025. While the introduction and development of Wi-Fi 7 certainly doesn't mean the end of Wi-Fi 6 and Wi-Fi 6E, Wi-Fi 7 products will undoubtedly impact the wireless technology landscape.

For example, as many organisations will not have already made the switch to Wi-Fi 6 or Wi-Fi 6E, it's likely that – when they eventually do upgrade their hardware – some will skip it altogether and move forward with the adoption of Wi-Fi 7 technology. As part of its trajectory, the industry should expect to see the Wi-Fi 7 market expand significantly over the coming 12 months.

Wi-Fi 7 is a paradigm shift in wireless connectivity.



Wi-Fi 7 Explained: Unlocking a New Era of Wireless Connectivity

While Wi-Fi 6 continues to roll out, its successor, Wi-Fi 7 (802.11be), is already on the horizon, promising a seismic leap in performance, efficiency, and versatility. For telecom operators, understanding Wi-Fi 7's capabilities is no longer optional – it's a strategic imperative.

Redefining performance: Speed, latency, and beyond

Imagine downloading entire datasets in seconds, experiencing lag-free VR collaboration across continents, or connecting hundreds of IoT devices seamlessly. Wi-Fi 7 makes these visions a reality. What are its key weapons?

Multi-Link Operation (MLO) – The primary benefit

of MLO is a robust backhaul connectivity between the Home Gateways and the Wi-Fi extenders. MLO aggregates the different channels to increase the amount of data which can be transmitted, offering a significantly improved Wi-Fi performance in and around the home,

Low Latency – No more buffering. Wi-Fi 7 slashes latency to near-imperceptible levels, ideal for real-time applications like remote surgery, industrial automation, and AR/VR experiences.

4K Quadrature Amplitude Modulation (QAM) – Compared to Wi-Fi 6' 1024 QAM, 4K QAM packs 20% more data into each signal, translating to dramatically faster speeds.

Spatial streams, and the MU-MIMO advantage Wi-Fi 7 expands upon MU-MIMO (Multi-User MIMO) technology, allowing access points to communicate with multiple devices simultaneously using spatial streams.

This provides:

- Improved Network Efficiency – More devices can receive data concurrently, reducing congestion and boosting overall network throughput.

- Enhanced User Experience – All connected devices experience consistent, high-speed performance, even in densely populated environments.

Connecting smart homes

For smart home ecosystems, Wi-Fi 7 is a game-changer. Its low latency and robust connectivity seamlessly manage the ever-growing number of connected devices, from smart speakers and thermostats to security systems and wearables. Imagine a truly responsive smart home, where devices anticipate your needs and function flawlessly in perfect harmony.

Security tightened

With the growing attack surface in wireless networks, security is paramount. Wi-Fi 7 incorporates the latest WPA3 security protocols, including improved password authentication and stronger encryption, building a robust defence against cyber threats.

Going green and staying connected

Wi-Fi 7 is also improving sustainability credentials. Features like Target Wake Time (TWT) allow devices to sleep more frequently, reducing power consumption while maintaining responsiveness.

Ultimately, this leads to longer battery life for mobile devices, and lower energy bills for organisations.

Unleashing productivity and efficiency with organisational benefits

While Wi-Fi 7 boasts impressive technical feats like Multi-Link Operation and low latency, its true power lies in unlocking organisational benefits. Picture employees collaborating seamlessly through flawless video conferences and file sharing, unhindered by lag. Imagine a future-proofed infrastructure handling the inevitable rise of data-hungry applications and connected devices. This is the reality Wi-Fi 7 delivers, boosting operational efficiency, minimising downtime, and ultimately empowering your workforce to innovate and excel.

Wi-Fi 7 is a paradigm shift in wireless connectivity. Its potential to revolutionise industries, unlock new possibilities, and redefine user experiences is undeniable. In the next sections of this whitepaper, we'll delve deeper into specific applications, implementation considerations.

Stay tuned – the future of wireless is here, and it's powered by Wi-Fi 7.



We're not just a technology provider,
but a strategic partner when
navigating the Wi-Fi 7 landscape.

Why Heights Telecom?

We are powering the Wi-Fi 7 revolution for communication service providers

We've laid bare the transformative potential of Wi-Fi 7, but the question remains: how can CSPs harness its power to deliver a superior, future-proofed internet experience for their customers?

Enter Heights Telecoms. We're not just a technology provider, but a strategic partner when navigating the Wi-Fi 7 landscape.

Taking a holistic approach, beyond the hardware

Raw speed is undoubtedly a cornerstone of Wi-Fi 7, but we understand that true differentiation lies in a well-rounded approach. Our suite of solutions goes further than simply providing the hardware, we offer:

- Customisable Residential Gateways – Built on an open platform, our innovative, stylish Residential Gateways allow CSPs to tailor features and services to suit their specific customer segments and needs. Through Heights Telecom, CSPs can offer a range of packages, from premium solutions leveraging enhanced security protocols, to dedicated bandwidth for gamers. Versatility for all.
- Containerised software architecture – Our implementation of containerised software across all platforms revolutionises application management and development. These tools enable high levels of efficiency by isolating applications from the system while maintaining seamless communication with the external environment. This marks a significant breakthrough in our HomeGateways and Wi-Fi extenders, offering enhanced functionality and adaptability.
- Software-centric Management – We strive to empower CSPs with a robust orchestration system for remote service management and containerised software updates. For CSPs,

this means faster service rollout, simpler maintenance, and the ability to rapidly adapt to evolving customer demands.

- Industry expertise – Our team of seasoned professionals possesses deep knowledge of Wi-Fi 7 technology and the CSP landscape. We have our finger on the pulse, collaborating closely with our partners, providing expert guidance and support throughout every stage of their Wi-Fi 7 journey.

Achieving future-proof profitability

CSPs face the dual challenge of delivering exceptional customer experience while also optimising for profitability. Our solutions address both aspects.

Reducing operational costs – Streamlining network management, minimising maintenance expenses, and freeing up resources for other strategic initiatives – all achievable throughout open platform and software-centric approach.

Enhanced customer value – By offering customisable and feature-rich internet packages, CSPs can attract and retain high-value customers, driving revenue growth and subscriber loyalty.

Future-proofed investments – Investing in Wi-Fi 7 with Heights Telecom positions CSPs as frontrunners in the next generation of connectivity, opening doors to lucrative opportunities in emerging markets and applications.

In essence, we empower CSPs to move beyond simply 'selling Wi-Fi 7'. We equip them with the tools and expertise to build a differentiated, profitable, and future-proof internet business that thrives in the Wi-Fi 7 year.

At Heights Telecom, we are committed to working alongside CSPs as they embrace this transformative technology. By leveraging our cutting-edge solutions and unparalleled expertise, we can unlock a new era of connectivity, together. We believe in partnering for progress.



HT-880BE 10G AE

Wi-Fi 7 Tri-Band

To handle the premium connection that Wi-Fi 7 offers, suppliers will need the highest quality, purpose-built equipment. Already ahead of the Wi-Fi 7 adoption curve is the Heights HT-880BE, the latest tri-band Wi-Fi 7 Gateway delivers transformative, ultra-high connectivity.

This gateway, equipped with Tri-band Wi-Fi 7 architecture (4x4 + 4x4 + 4x4), integrates XGSPON and Active Ethernet technologies. Its cutting-edge and containerised software that sets HT-880BE apart, empowering operators to elevate their services, enhance user experience, reduce churn, and drive revenue growth.

Empowering operators with unparalleled flexibility, this gateway allows businesses and individuals alike to elevate services and enhance user experiences.

The HT-880BE 10G AE offers a tailored VoIP port, ensuring communication and connection is seamlessly integrated.

Key Features

- XGSPON BOSA MODEL
- Containerised SW
- OpenSync
- Tri Band Wi-Fi 7
- Wi-Fi 4x4 + 4x4 + 4x4
- EasyMesh R5
- BLE + Zigbee + Thread
- Matter Supported
- 10G LAN + 4X1G LAN / 4X2.5G LAN (optional)
- Optional SFP 10G Cage
- QUOSA optional

HT 6766BEM 10G AE

Wi-Fi 7 Tri-Band

A powerhouse of connectivity, the Heights HT-6766BEM 10G AE Active Ethernet Gateway boasts a dynamic combination of Tri Band Wi-Fi 7 architecture (2x2 + 4x4 + 4x4), delivering fastest ever performance over both frequency bands. With its 10G Active Ethernet, it offers an ultra-high connectivity solution with containerised software and containerised software within minutes.

The HT-6766BE offers a tailored VoIP port, ensuring communication and connection is seamlessly integrated.



Key Features

- 10G Active Ethernet WAN
- GPON (optional)
- Containerised SW
- OpenSync
- Tri Band Wi-Fi 7
- Wi-Fi 2x2 + 4x4 + 4x4
- EasyMesh R5
- BLE + Zigbee + Thread (optional)
- Matter Supported (optional)
- 10G LAN + 3X1G LAN
- 1x FxS VoIP Port

HT 6766BE 2.5G AE

Wi-Fi 7 Dual-Band

A powerhouse of connectivity, the Heights HT-6766BE 2.5G AE Active Ethernet Gateway boasts a dynamic combination of Dual Band Wi-Fi 7 architecture (2x2 + 4x4), delivering fastest ever performance over both frequency bands. With its 2.5G Active Ethernet, it offers an ultra-high connectivity solution with containerised software and containerised software within minutes.

The HT-6766BE offers a tailored VoIP port, ensuring communication and connection is seamlessly integrated.



Key Features

- 2.5G Active Ethernet WAN
- Containerised SW
- OpenSync
- Dual Band Wi-Fi 7
- Wi-Fi 2x2 + 4x4
- EasyMesh R5
- BLE + Zigbee + Thread (optional)
- Matter Supported (optional)
- 2.5G LAN + 3X1G LAN
- 1x FxS VoIP Port

The ERO1 series
is more than
just a mesh
extender; it's a
gateway to the
future of Wi-Fi

Unleashing the Power of Wi-Fi 7 with the ERO1BE and ERO1BE PRO

Complementing our gateway products, designed to deliver unparalleled security, performance, and management capabilities for your ever-evolving network needs, are the extenders, the ERO1BE and ERO1BE PRO. This is the next step in building a truly seamless wireless ecosystem with the introduction of these devices – powerful mesh extenders poised to unlock the full potential of Wi-Fi 7 and empower businesses of all sizes.

Revolutionising connectivity

The ERO1BE and ERO1BE PRO boast robust Wi-Fi 7 tri-band capabilities, harnessing the power of the 2.4GHz, 5GHz, and the brand-new 6Hz band. This translates to unprecedented capacity, speed, and ultra-low latency, supporting even the most demanding applications. Seamless video conferencing, uninterrupted data transfers, and lag-free gaming – all made possible by the ERO1 series.

Beyond exceptional speed, the ERO1BE series offers versatile functionality. Both models operate as both routers and mesh extenders, providing unmatched flexibility in network deployment. Whether you need to expand existing Wi-Fi coverage or establish a

new network entirely, the ERO1 series adapts to your needs.

Performance

The ERO1BE boasts an impressive maximum wireless signal rate of 6.5Gbps, while the ERO1BE PRO pushes the limits even further with a staggering 12.5 Gbps. This translates to lightning-fast data transfers, supporting even the most bandwidth-hungry applications with ease. Additionally, both models leverage multi-link operations, allowing concurrent use of 5G and 2.4G bands for optimised performance and seamless roaming.

Enterprise-grade security

Security is paramount, and the ERO1 series doesn't compromise. Both models come equipped with NAT for basic firewall support, packet filtering firewall, and password authentication to your gateway, ensuring your network remains secure and protected.

Future-proofing your business

With Wi-Fi 7 being the future of wireless connectivity, the ERO1 series represents a future-proof investment. Designed to seamlessly integrate with existing Wi-Fi 7 devices while maximising the potential of Wi-Fi 7 technology, the ERO1 series ensures your network stays ahead of the curve.

The ERO1 series is more than just a mesh extender; it's a gateway to the future of Wi-Fi. With its unmatched performance, versatile functionality, and enterprise-grade security, the ERO1BE and ERO1BE PRO empower businesses to unlock the full potential of Wi-Fi 7 and thrive in the ever-evolving digital landscape.



Envisioning the Future with Wi-Fi 7

As we move forward, the landscape of connectivity continues to evolve at an unprecedented pace. With the advent of Wi-Fi 7, we stand at the precipice of a transformative era in wireless networking that promises to redefine the way we interact with the digital world.

However, it should be noted that, for the moment, the arrival of Wi-Fi 7 won't mean the disruption of existing wireless technologies on the market.

Though the benefits and improved features of Wi-Fi 7 speak for themselves, there are currently a streamlined amount of consumer devices on the market which can support this technology. With this in mind, we expect that 2024 will be an introductory phase for Wi-Fi 7, where the industry will witness many new products coming to market. It will only

be moving into 2025 and 2026 that the industry will see major adoption and mass deployment.

As we see it, Wi-Fi 7 is very much a future-facing technology, and we expect to see demand grow significantly in the coming years. It's worth noting that existing connectivity solutions on the market – primarily Wi-Fi 6 and Wi-Fi 6E – are by no means ineffective. In fact, for many users, sticking with the existing technology will be the most effective choice for their environment.

And as businesses and the home become increasingly connected, the need for a robust and reliable connectivity solution will be even more paramount to success.

For more information about Heights Telecom's range of pioneering Wi-Fi 7 solutions visit www.heights-t.com

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