

The Reconstruction OF THE TELECOMMUNICATIONS LANDSCAPE

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STEVE HARRIS IS AN INFLUENTIAL VOICE IN THE U.S. TELECOMS INDUSTRY BRINGING DECADES OF EXPERIENCE INTO SHAPING BROADBAND STRATEGY AND INFRASTRUCTURE DEVELOPMENT. A SEASONED EXECUTIVE, HE HAS PLAYED A PIVOTAL ROLE IN ADVANCING FIBRE DEPLOYMENT AND PUBLIC-PRIVATE PARTNERSHIPS ACROSS THE COUNTRY. IN THIS ARTICLE, HARRIS SHARES HIS INSIGHTS ON THE EVOLVING TELECOMS LANDSCAPE AND WHAT'S NEXT FOR BROADBAND IN AMERICA.



INTRODUCTION

Looking back on my time at Comcast over two decades ago, I recall the transformative strides we made in digitisation. We transitioned our RF communications from analogue 6MHz channels (8MHz in Europe) to digital 6MHz quadrature amplitude modulation (QAM) channels within our hybrid fibre coaxial (HFC) access network. This shift addressed critical capacity challenges in the RF spectrum and laid the foundation for significant advancements in future products and services we offered. At the same time, we also undertook the migration from IPv4 to IPv6 in our core and aggregate networks, a necessary step to tackle the growing scarcity of IPv4 addresses at the time.

These technological changes in the US were pivotal, enabling the introduction of digital voice services (formerly PSTN), standard/high-definition (SD/HD) MPEG-2 video channels, and preparing for DOCSIS channel bonding to expand downstream bandwidth for our high-speed data (HSD) customers. There was also rapid growth of digital subscriber line (DSL) technology at the time, which outpaced DOCSIS cable modem subscriptions, and drove much of these innovations. These investments were not only crucial for maintaining competitiveness but also for anticipating future demands in an evolving and reconstructed telecommunications landscape.

Fast forward to today, and the pace of technological advancement remains unprecedented. The industry faces

ongoing challenges as multi-system operators (MSO), Internet service providers (ISP), fibre-to-the-home (FTTH) providers, and wireless carriers navigate complex investment decisions to keep up with innovation. As we look ahead to 2025 and beyond, networks must continue to evolve to enhance our daily lives. The drive for digitisation and technological progress is as essential now as it was then, ensuring that telecommunications can meet the demands of an increasingly connected world.

AMERICAN AND EUROPEAN TELECOMMUNICATIONS INVESTMENT

Reflecting on investment dynamics, building telecommunications networks in the US remains significantly different and more expensive than in Europe or Latin America. Costs associated with spectrum acquisition, workforce expenses, taxation, permitting, pole access/make-ready processes and mapping are approximately 50% higher in the US, creating substantial barriers to network development¹.

In Europe, however, ISPs benefit from network unbundling regulations that allow operators to offer products and services without owning their infrastructure—a stark contrast to the US model. However, unbundling lowers annual revenue per unit (ARPU) for European operators, fostering competition and providing consumers with more affordable options. US operators are still benefiting from higher ARPUs. Collaborative models such as unbundling and network sharing are

gaining traction globally as a means of reducing capital expenditures (CapEx). Shared infrastructure projects have demonstrated potential savings of up to 40% on CapEx - a strategy that could prove transformative as the industry evolves towards 2030².

In the US, mergers and acquisitions (M&A) continue to reshape our landscape. Recent examples include Charter Communications agreeing to acquire Liberty Broadband and Cable One expanding its investment in Vyve Broadband. AT&T is reportedly in talks to acquire Lumen Technologies' consumer fibre-optic network, while T-Mobile has finalised a joint venture (JV) with Lumos Fibre. M&A is not just unique to the US, as Vodafone and Three have received approval to merge, forming the UK's largest mobile operator. Swisscom has signed a binding agreement to acquire 100% of Vodafone Italia, to name a few. These moves reflect a growing need for operators to scale effectively amidst competitive pressures.

Sustainability is increasingly shaping telecommunication strategies on both sides of the Atlantic, but with notable differences. European operators embed sustainability deeply into their strategies through stricter government regulations and environmental mandates. They are moving towards utility-like models focused on infrastructure sharing and reduced energy consumption—essential steps toward carbon neutrality. In contrast, US operators are still in the early stages of integrating sustainability initiatives. While there is growing emphasis on energy efficiency and environmental, social, governance (ESG) reporting, these efforts remain largely operator-driven rather than mandated by policy. An area in which US operators could learn from European strategies.

From a technology perspective, DOCSIS continues to play a significant role in the US, offering incremental investments with high speeds and reliability over coaxial networks. Distributed access architecture (DAA) enhances flexibility by supporting DOCSIS services alongside FTTH optical networks like passive optical networks (PON) (see figure #1) and emerging technologies such as edge computing and artificial intelligence (AI) operations. Fixed wireless access (FWA) deployments are expanding faster in the US (see figure #2), while renewed interest in satellite connectivity through providers like Amazon and Starlink addresses rural connectivity challenges.



Annual North American FTTH Growth

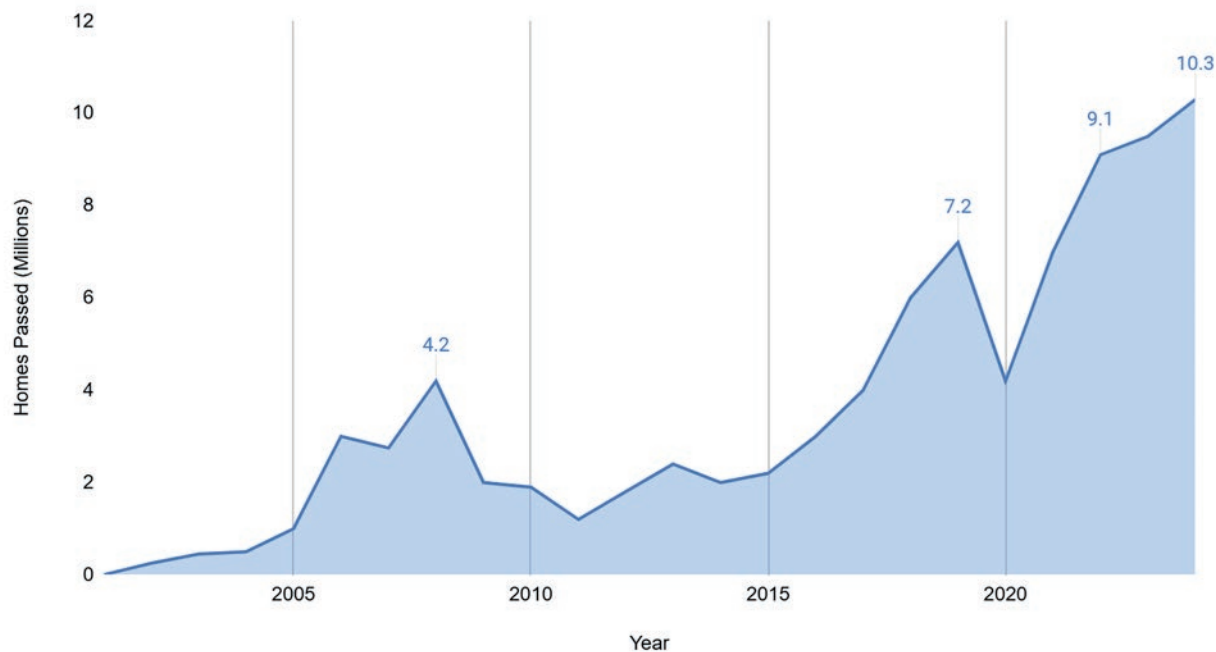


Figure 1: Annual North American FTTH Growth (Marketed), Source: FBA

FUTURE OUTLOOK

As we move towards 2030, telecommunications operators must focus on controlling their CapEx and operational expenditure (OpEx), monetising their investments effectively while leveraging M&A activity to drive value³. In addition to AI, operators are working hard to control the shape of 6G, the next generation of wireless. Operators are expected

to start monetising 6G in 2030, with pre-commercial trials expected in 2028. Further access network investments include virtualised DOCSIS/DAA, software-defined network (SDN) PON and multi-access edge computing (MEC), which will allow the network edge to analyse, process and store data instead of sending it all to the cloud for processing. SDN, virtualisation (e.g. vCMTS) and network orchestration with

AI will enable more automated and agile network operations. A technology many of the US operators are following closely is quantum computing, exponentially faster than current platforms.

The US is heavily investing in data centres, cybersecurity, OpenRAN, big data, network orchestration, converged networks, spectrum, virtualisation, cloud network synergy and related

Global 5G FWA Market

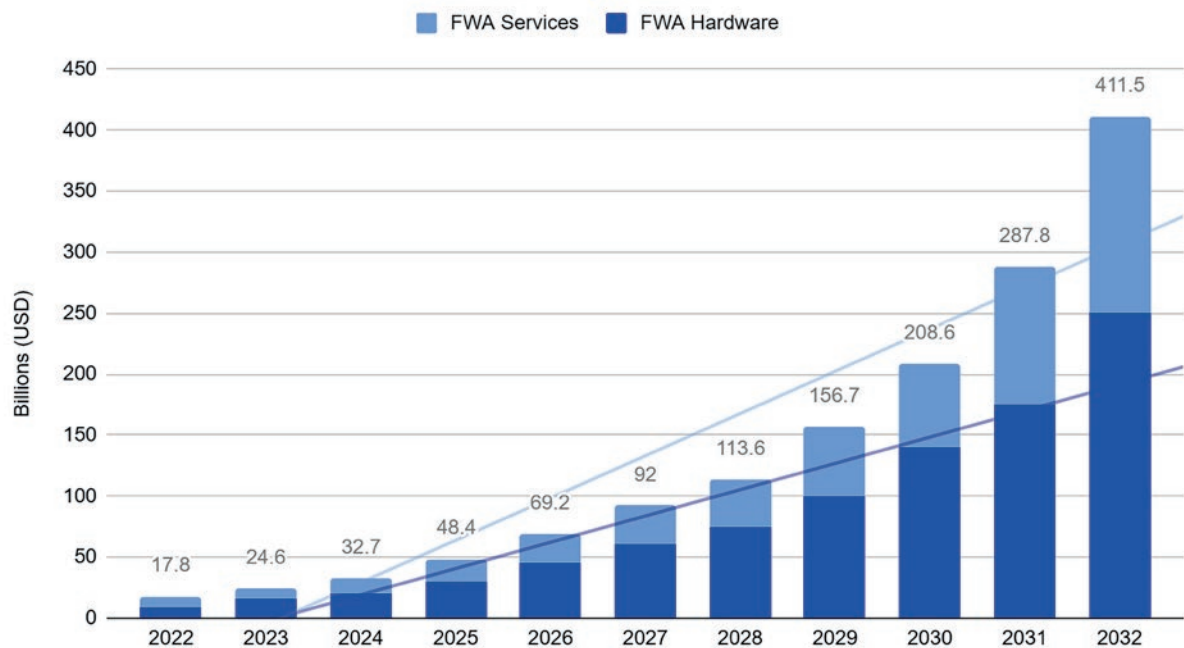


Figure 2: Global 5G FWA Market in USD Billions, Source: Market.us



Figure 3: Investments

infrastructure. The US is the largest energy-efficient data centre market globally, with major investments from the top hyperscalers AWS, Google, Microsoft and Meta⁴. To enhance operator control, predictability and efficiency, the US is also prioritising deterministic networking and segment routing over IPv6 (SRv6). SRv6 is well documented in IETF RFC 8986.

While the US cable operators prioritise network control and efficiency, Europe's investments are more sustainability-driven. Europe emphasises sustainability under the EU Green Deal and Digital Decade policies, with the majority of operators favouring new FTTH deployments for energy efficiency over upgrading legacy systems like HFC or 'fibre deep' architectures. A fibre deep enhances an HFC architecture by moving the optics closer to the residential customer or business; however is not 100% optical. Both US and European telecommunications and Internet operators are investing in the future of photonics, for example: nanophotonics R&D. While still emerging, nanophotonics is a promising fibre-to-chip integration, moving optical technology into routers, switches and eventually right to the edge.

Our industry appears to want to shift into growth mode with generative AI; the European Union has articulated that by 2030, 75% of European enterprises will have taken up cloud computing, big

data and AI services, and more than 90% of European small- and medium-sized enterprises will reach at least a basic level of "digital intensity"⁵. Today, both the US and Europe are investing in AI intelligence tools to improve network reliability, sustainability, and the customer quality of experience (QoE).

Consumers' expectations for a connected world continue to grow alongside emerging technologies such as 4K/8K television, virtual reality (VR) headsets like Apple Vision Pro, and future cyber worlds like the Metaverse or Digital Twins—all requiring robust communication networks.

The telecommunications industry stands at a crossroads where innovation, sustainability, collaboration and strategic investment will define its success over the next decade. Having witnessed decades of transformation - from the early days of DOCSIS to today's cloud-native architectures - I am confident that the industry will continue to reinvent and reconstruct itself.

The road ahead is complex, but the imperative is clear: to build networks that don't just keep pace with change but accelerate it!

STRATEGIC PARTNERSHIP WITH LEARNING ALLIANCE CORPORATION

In a significant development that further expands my commitment to addressing industry challenges, Harris DigiTech has recently partnered with Learning Alliance Corporation, with Steve Harris as their Senior Vice President of Continuing Education Programs. This strategic alliance directly addresses several critical pain points that continue to hamper telecommunications growth: unscalable training models, fragmented credential tracking, contractor mismanagement and the widening skilled labour gap.

Through this partnership, we now offer comprehensive workforce development solutions tailored specifically for telecommunications providers. These include customised content and training programmes built around team-specific

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requirements, Learning Management System (LMS) services that track competencies and career pathways across workforces and Unify CMS—a complete contractor management system ensuring compliance and proper credentialing. Additionally, we provide industry-recognised fibre optic and telecommunications certifications that produce job-ready technicians.

This collaboration represents a natural evolution in addressing the telecommunications industry's pressing need for skilled professionals while offering scalable solutions that reduce operational inefficiencies. As networks continue to grow in complexity, this partnership delivers the educational infrastructure necessary to support sustainable industry advancement.

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 2. HUAWEI Technologies Co., LTD.
 3. <https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/the-future-of-telcos-mapping-the-routes-to-renewed-success#/>

4. Synergy Research, CBRE
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