

Mobile Data Offload (MDO)

# Efficient Offloading, Enhanced Connectivity

HFCL's Access Solutions Elevating  
User Experience through Mobile Data  
Offloading



# Background

In the rapidly evolving field of mobile telecommunications, the upswing in the demand for data services, fueled by the widespread embrace of smartphones and data-intensive applications, results in network congestion. Licensed spectrum, the backbone of mobile connectivity, is a finite and expensive resource. The spectrum scarcity is particularly pronounced in markets with high data consumption, such as India. The escalating costs associated with acquiring and maintaining licensed spectrum, coupled with the strain on network infrastructure from expanding data-savvy user bases, have prompted the exploration of innovative solutions.

Mobile Data Offloading (MDO) comes into play as a strategic response to these challenges. It involves redirecting data traffic from congested licensed spectrum to available unlicensed spectrum, such as Wi-Fi networks and since unlicensed band spectrum is free around the world, Telecom Service Providers (TSPs) save on spectrum costs and are able to accommodate more customers and users in the same licensed spectrum. In addition, the cost of deploying a Wi-Fi hotspot is a fraction of deploying a 4G base station (or eNodeB) - in fact, it costs much less than even deploying a small cell or a femtocell. Essentially, the savings that TSPs enjoy are three-fold – spectrum costs, deployment costs and reduced customer complaints.

This not only alleviates network congestion but also optimizes the use of available resources, leading to improved network performance and a better user experience. Thus, the need for Mobile Data Offloading is paramount in the face of growing data demands, network congestion, and the challenge of optimizing the utilization of licensed spectrum. By strategically shifting data traffic, MDO offers a solution that ensures a smoother, more cost-effective, and efficient mobile connectivity experience for users and providers alike.

**In 2023, India held the world's second-largest internet user base, totaling over 1.2 billion. Out of this, 1.05 billion accessed the internet using mobile phones. Projections indicate this number will exceed 1.2 billion by 2050.<sup>1</sup>**

**In 2022, the average monthly mobile data usage per smartphone worldwide was 15.93 gigabytes, rising from 12.18 gigabytes in the prior year. Projections suggest this will climb to 20 gigabytes in 2023 and a substantial 47 gigabytes by 2028.<sup>2</sup>**



# Overview

At HFCL, we are proud of our game-changing strides in Mobile Data Offloading (MDO). Our focus on innovative and customer-centric solutions has empowered telecom service providers (TSPs) with cost-effective and seamlessly integrated MDO applications. Our deployed solutions have reduced operational costs while significantly enhancing user experiences. We are dedicated to scaling these achievements globally, positioning HFCL as a prominent player in reshaping telecom networks worldwide.

**Shashank Sejwal**  
Assistant General Manager

In the current landscape, telecom service providers are increasingly recognizing the potential of Wi-Fi as an effective means to alleviate congestion in their cellular networks, ultimately enhancing the overall network experience for their customers. This strategic shift not only offers improved network quality but also grants TSPs the flexibility to boost bandwidth and capacity in high-demand areas, presenting a practical and cost-effective solution. In essence, they are acknowledging the importance of supplementing their existing networks with complementary technologies, and Wi-Fi has emerged as a ubiquitous and indispensable choice in this evolving paradigm.

According to recent data usage reports from Ericsson, the average monthly mobile data usage per smartphone is anticipated to surge to 56 GB globally, a substantial increase from the 21 GB recorded at the close of 2023.

The growing demand for continuous connectivity on the go from mobile users is addressed by mobile data offloading, a solution that efficiently redistributes data traffic. By intelligently redirecting traffic to alternative networks, it not only alleviates congestion on cellular networks but also optimizes spectrum usage, resulting in a more dependable and faster data connection. Furthermore, mobile data offloading serves as a space and power-efficient strategy, relieving network strain without requiring extensive infrastructure upgrades and thereby enhancing overall network efficiency.

HFCL's Access Solutions have played a pivotal role by providing a comprehensive end-to-end solution that facilitates seamless offloading of data traffic. These access solutions, such as Wi-Fi, optimize the utilization of unlicensed spectrum and ensure a smooth transition of data between different network interfaces. Through strategically offloading data traffic, these solutions significantly enhance the overall performance of mobile networks, providing a cost-effective and efficient means to manage increasing data consumption.

**India boasts the highest average data traffic per smartphone globally. Projections indicate a rise from 31GB per month in 2023 to approximately 75GB per month by 2029.<sup>3</sup>**

**During 2018, the total monthly global mobile data traffic hit 19.01 exabytes. Forecasts anticipate a surge to 77.5 exabytes per month by 2022, reflecting a compound annual growth rate of 46 percent.<sup>4</sup>**

# Challenge

The imminent surge in global average monthly mobile data usage, projected to rise to 56 GB per smartphone from the current 21 GB by the end of 2023, presents a formidable challenge. Telecom providers must address this surge while also navigating the task of maximizing the use of licensed spectrum while enhancing customer satisfaction. This involves optimizing resource allocation, minimizing network congestion, and developing effective strategies to ensure a seamless and reliable data experience for customers.

# Solution

HFCL has devised an all-encompassing solution tailored for telecom service providers to overcome the challenges in mobile data offloading. Our solution seamlessly integrates with various industry-standard mobile cores and offers a comprehensive suite of services for Mobile Data Offload (MDO) applications. Central to our offering is the Cloud Network Management System (cNMS), a unified platform combining the functionalities of a controller and EMS. This robust system empowers Telecom Service Providers (TSPs) with centralized control, allowing for streamlined configuration, bulk upgrades, and advanced network diagnostics tools. With AI-based capabilities, it enables remote monitoring and troubleshooting, effectively reducing network maintenance costs. Our suite comprises Wi-Fi 5 and Wi-Fi 6 indoor and outdoor Access Points. Notably, these Access Points are vendor-agnostic, facilitating seamless integration with any global network infrastructure. Managed effortlessly by the cNMS, these Access Points ensure efficient control and management of the entire Wi-Fi network.

HFCL's solutions offer unparalleled flexibility by integrating effortlessly with diverse global networks. Furthermore, these solutions boast built-in functionalities such as automatic transmit power control (ATPC), load balancing, band steering, and automatic channel selection (ACS). These features synergize to ensure optimal utilization of the unlicensed spectrum, thereby optimizing the entire network's performance. Additionally the solution has proven instrumental in enhancing network control and management while reducing operational overheads. Through scalable deployments tailored to specific network requirements, HFCL continues to enable telecom service providers to navigate spectrum constraints and provide superior user experiences.

## Indoor Wi-Fi

Wi-Fi 5 & Wi-Fi 6 Access Points



## Outdoor Wi-Fi

Wi-Fi 5 & Wi-Fi 6 Access Points



## cNMS

Cloud network management for a single window view of the entire network

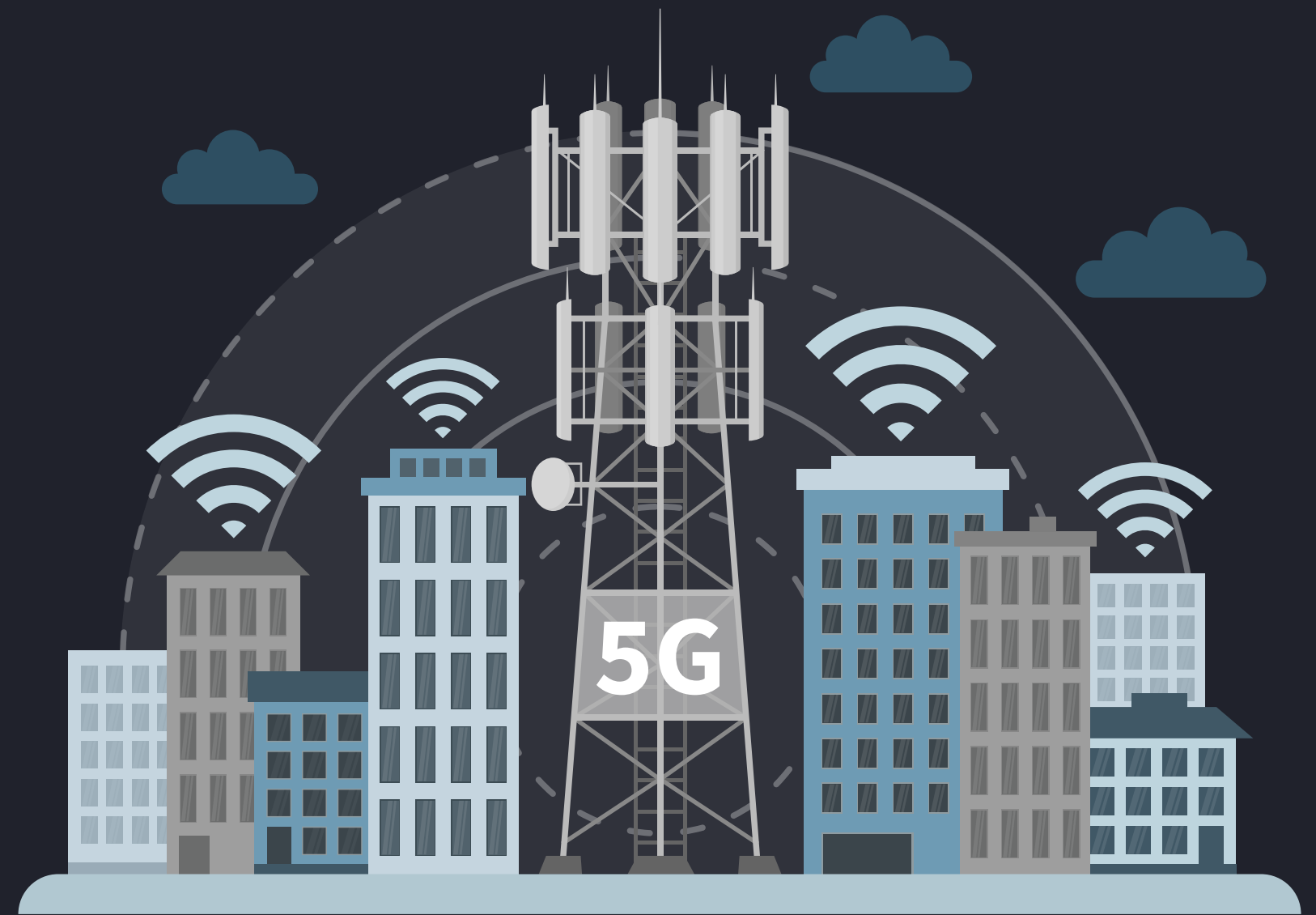


# Result

- 01** Approximately 65% of overall traffic in MDO zones was successfully offloaded to Wi-Fi, significantly reducing the strain on licensed spectrum. This led to enhanced network efficiency and improved service quality for end-users.
- 02** Telecom service providers experienced substantial savings in spectrum costs, as Wi-Fi deployment costs were notably lower than traditional 4G base station deployment expenses. This cost-effectiveness contributed to revenue growth among operators.
- 03** More than 5-6 million unique mobile users were served daily in India.
- 04** Decongested cellular networks and accelerated user data consumption, contributing to revenue growth for operators.

# Conclusion

HFCL's innovative MDO solution redefined spectrum utilization, network efficiency, and user experience for telecom operators. Their commitment to evolving technologies and seamless integration propelled them to the forefront of the telecom industry, revolutionizing mobile data offloading on a global scale.



# References

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