

CASE STUDY

HGC Deploys Mobile Fronthaul Services in Hong Kong with Infinera Mobile Fronthaul Solutions



CUSTOMER

Hutchison Global Communications (HGC)

CHALLENGE

HGC wanted to lead the market with a new wholesale service offering to provide high-capacity active mobile fronthaul to support continued growth of 3G and 4G services and to enable a smooth transition to 5G services and Cloud-RAN architectures

HGC required an optical WDM mobile fronthaul solution that supports all key CPRI rates with the high performance, scalability and robust capabilities needed to ensure a successful roll-out of the new service

SOLUTION

The XTM Series Mobile Fronthaul Solution, part of Infinera's Intelligent Transport Network portfolio, supports all key CPRI rates, provides ultra-low latency, superior synchronization, low power consumption and high density

RESULTS

By delivering one of the first wholesale mobile fronthaul services to operators in Hong Kong, HGC is helping mobile operators, including its sister company 3 Hong Kong, prepare for LTE-Advanced/4.5G and 5G and enhance the quality of experience for their mobile consumers



HUTCHISON GLOBAL COMMUNICATIONS LIMITED (HGC) is a leading fixed-line operator, IT service provider, carrier's carrier and one of Hong Kong's largest-scale Wi-Fi service providers. HGC empowers local and overseas customers with one-stop international, corporate, data center and residential broadband services. HGC also offers cloud computing and high-speed Wi-Fi services, and is expanding its service portfolio to include mobile fronthaul.

A subsidiary of Hutchison Telecommunications Hong Kong Holdings Limited (HTHKH), HGC owns an extensive fiber optic network throughout Hong Kong, Kowloon and the New Territories to provide all aspects of connectivity, including cross-border routes and submarine landing stations. In addition to providing residential broadband services, HGC offers a comprehensive range of fixed-line telecommunications services to international and local carriers and data center operators in Hong Kong and overseas. The company's success is attributed in part to HGC's commitment to innovative application of the latest technologies.

HGC's Challenge and Opportunity

HGC wanted to provide mobile operators within the Hong Kong region with high-capacity active mobile fronthaul services.

The rapid deployment of 3G and 4G, along with the

unrelenting growth of video, social media and cloud applications accessed via smart phones and tablets, is creating the need for more bandwidth to the cell tower and setting the stage for a move to 5G wireless technology.

In preparing for 5G, cloud radio access networks (C-RANs) have been considered the next step in mobile networks. C-RANs bring economic advantages to HGC's mobile operator customers for today's 2G/3G/4G networks, and help move them toward LTE-Advanced/4.5G and 5G networks, which require advanced cell coordination techniques and efficient spectrum utilization.

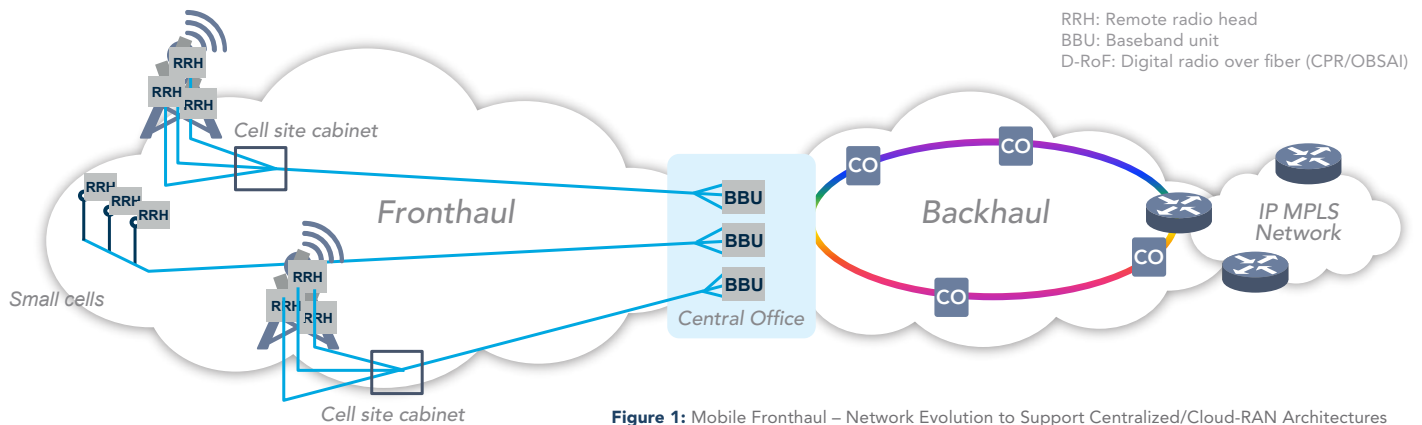
C-RANs will provide HGC's customers with significant economic and operational advantages, including the centralization and virtualization of key network functions.

C-RAN involves splitting the two main functions that are traditionally located within the

cell site, and moving one of these to a centralized location deeper in the network. The two functions are the remote radio head (RRH) that remains

"We considered the mobile fronthaul solutions in the market and concluded that the Infinera XTM Series solution best enables HGC to deliver massive bandwidth with low latency, while being adaptive to the evolution of mobile technology. The Infinera team was highly responsive, able to deliver quickly and implement services required by us."

Byron Chiang
Chief Technology Officer
HGC



in the cell site and the base band unit (BBU) that moves to a more centralized location, a “BBU hotel” in a central office location.

In order migrate to this new architecture while also supporting the massive growth of mobile data, HGC needed to deliver a new dense wavelength-division multiplexing (DWDM)-based mobile fronthaul service leveraging fiber all the way to the tower for these mobile operators.

HGC already had a deep fiber access network to support its fiber to the home (FTTH) and fiber to the business (FTTB) services. In fact, HGC operates over 1.45 million kilometers (km) of fiber cores, enough to circle the earth more than 36 times. This fiber footprint proved to be the ideal starting point for HGC’s new mobile fronthaul service offering because many cell tower locations coincide

with FTTH and FTTB services in this highly dense urban region.

HGC needed an ultra-low-latency fronthaul solution that would take advantage of that fiber while meeting the challenging requirements for Common Public Radio Interface (CPRI) transport. Latency is a challenge in mobile fronthaul networks due to the low latency budget of the CPRI protocol and the high proportion of this latency budget that is required for BBU processing. This leaves just a few hundreds of microseconds for transport over the fronthaul network, which equates to about 20 km in a typical fronthaul network. Active fronthaul solutions can consume a significant portion of this latency budget, so HGC required an ultra-low-latency solution to minimize the impact.

In addition to low latency, HGC needed very high-quality transparent synchronization transfer to ensure that the synchronization information from its backhaul service would

be seamlessly passed from the BBU to the RRH in the cell site equipment via its new mobile fronthaul network.

Finally, HGC required a solution with low power consumption and high density to minimize costs associated with power and rack space consumption in the cell sites.

Infinera Selected for HGC Mobile Fronthaul Network

HGC selected Infinera’s XTM Series active Mobile Fronthaul Solution for deployment across its optical network in Hong Kong.

As part of HGC’s selection and verification process, HGC tested what it determined to be the leading mobile fronthaul solutions to ensure that the challenging requirements for CPRI transport could be met in a real network. HGC’s lab evaluation verified that Infinera’s Mobile Fronthaul Solution not only met but exceeded these requirements.

A pioneer in this market, Infinera first trialed mobile fronthaul in

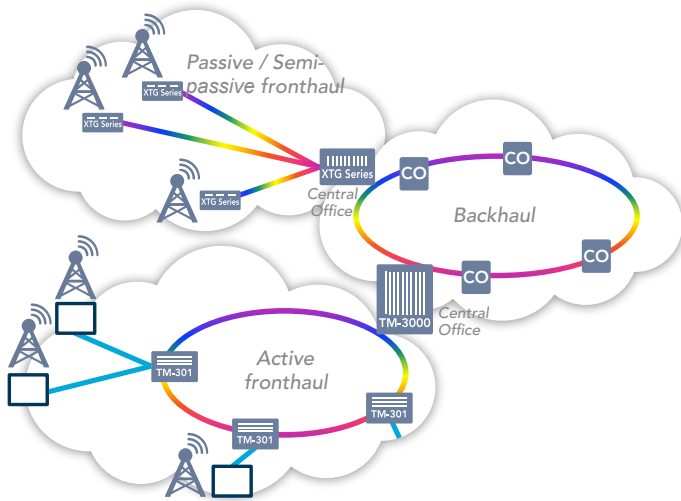


Figure 2: Infinera Offers The Full Range Of Mobile Fronthaul Options

a live operator network in 2013, which was one of the first trials using active WDM technology. Since 2013, Infinera has continually enhanced its mobile fronthaul technology, conducted additional trials and, starting in 2016, executed multiple deployments.

The Infinera XTM Series Mobile Fronthaul Solution supports all of the CPRI and Open Base Station Architecture Initiative (OBSAI) rates up to 12 gigabits per second (Gb/s) to accommodate HGC's initial services in Hong Kong that range from 2.5 Gb/s to 10 Gb/s. The XTM Series Mobile Fronthaul Solution affords industry-leading capabilities in the emerging fronthaul market, including low latency, superior synchronization, low power consumption and high density. In fact, the Infinera solution HGC selected has a latency of

only four nanoseconds, which equates to less than two meters of fiber.

With the XTM Series active Mobile Fronthaul Solution, HGC realizes several benefits:

Scalable Fronthaul Services with Clear Service Demarcation

- The transponder-based active option of the Infinera Mobile Fronthaul Solution enables HGC to deliver mobile fronthaul services featuring high bandwidth including up to 12G Option 10 CPRI services
- While the Infinera Mobile Fronthaul Solution also offers passive and semi-passive options, the active option provides HGC with a clear demarcation point to its wholesale fronthaul service

High Performance Network

- The XTM Series active Mobile Fronthaul Solution, with its three sub-options, provides ultra-low latency and superior sync performance enabling a differentiated fronthaul service
- Delay compensation is available in one of the XTM Series active Mobile Fronthaul sub-options enabling protected fronthaul services with constant network latency
- Low Power Design and High Density Design ensure the XTM Series Mobile Fronthaul Solution meets the challenging network deployment requirements

Simplified Optical Network Operations

- The Mobile Fronthaul Solution complements Infinera's Mobile Backhaul Solutions to enable optimizing the network for mobile traffic

- Active WDM also allows for the management of the mobile fronthaul network with advanced functionality, such as performance monitoring

HGC Delivers Innovative New Mobile Fronthaul Service in Hong Kong

By enabling mobile fronthaul services, HGC is helping mobile operators in Hong Kong stay at the forefront of mobile technology and enhance the quality of experience for their mobile consumers. The new mobile fronthaul service utilizes HGC's extensive fiber network and Infinera's active Mobile Fronthaul Solution to provide one of the world's first commercially available high-

"The deployment of the Infinera active Mobile Fronthaul Solution demonstrates HGC leadership deploying the latest mobile technologies. We are now turning up one of the first mobile fronthaul services to mobile operators in Hong Kong, including 3 Hong Kong, our sister company."

Byron Chiang
Chief Technology Officer
HGC

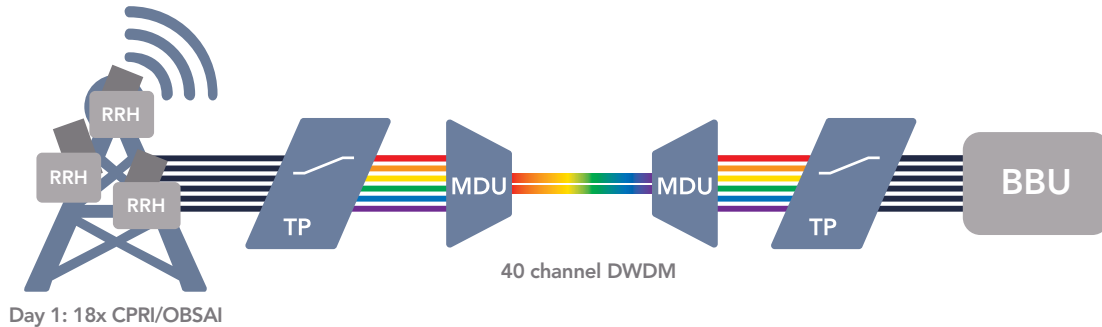


Figure 3: Typical HGC Mobile Fronthaul Link Supporting 18 CPRI/OBSAI Channels On Day One

capacity and ultra-low latency mobile fronthaul services.

The Infinera Intelligent Transport Network with XTM Series active Mobile Fronthaul Solution delivered the following results to HGC:

- With links now live, HGC is turning up one of the world's first commercially available mobile fronthaul services to mobile operators in Hong Kong, including 3 Hong Kong, HGC's sister company
- The new fronthaul architecture prepares HGC and its mobile operator customers not only for growth of 3G and 4G, but also for a smooth transition to Advanced LTE/4.5G services, 5G services and Cloud-RAN architectures

- HGC provides mobile operators with an ultra-low-latency mobile fronthaul service with outstanding synchronization performance, low power consumption, high bandwidth and high density
- HGC now offers wholesale services that support the CPRI v7 specification, including all rates up to 12 Gb/s, with transponders providing a clear demarcation point for the service
- With these services, HGC's operator customers can reduce their operating expenses while improving RAN performance

For more information on how Intelligent Transport Networks can enable network operators to scale network bandwidth, accelerate service innovation and simplifying network operations, [contact us](#).

"We applaud HGC's deployment of the XTM Series for mobile fronthaul, leading what we expect to be global adoption of this technology. With this deployment HGC has transformed its mobile transport architecture and positioned itself and its customers to effectively manage the tremendous growth of mobile data that should continue for the next several years."

Andrew Bond-Webster
Vice President, Regional Sales
APAC, Infinera