



# Operations Review

## Fixed-line Business

As a trusted network operator and ICT adviser, HGC is dedicated to providing customers with one-stop solutions via extensive and advanced infrastructure and facilities.

# Fixed-line Business



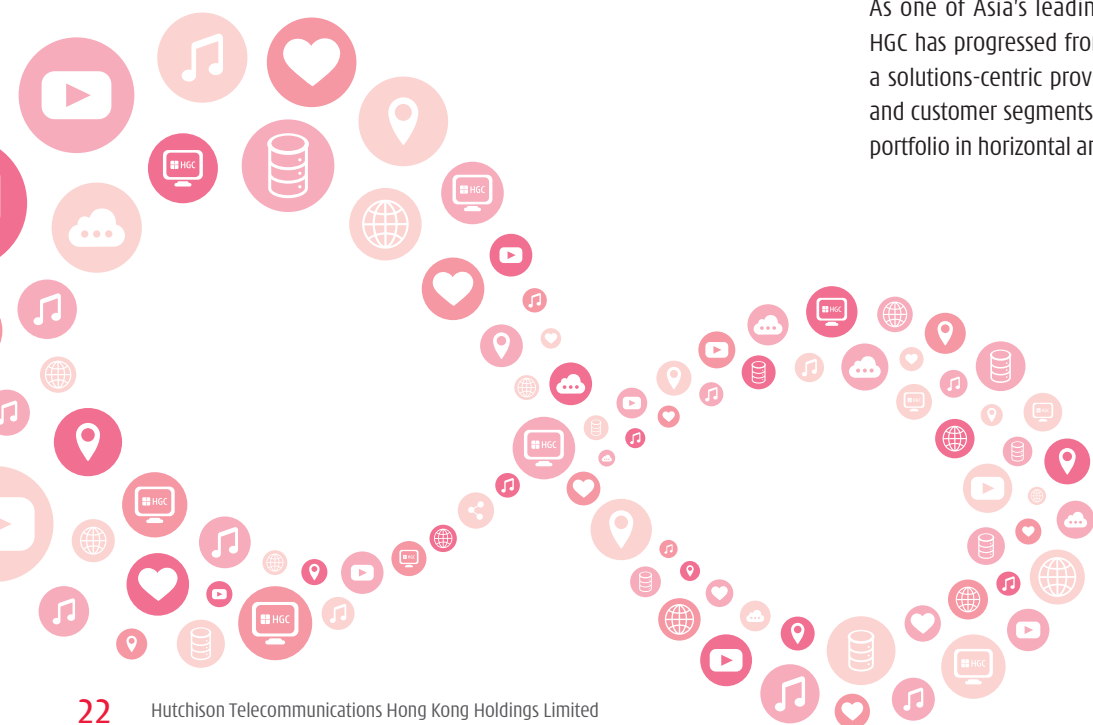
- HGC is one of the largest Wi-Fi service providers in Hong Kong, running more than 25,000 hotspots.

HGC continues to address the needs of international and local carriers, as well as corporate clients and residential customers, via an extensive network extending to more than 1.4 million kilometres of fibre-optic cable cores and 6,000-plus kilometres of ducting. This includes development of ducting infrastructure at the Hong Kong Boundary Crossing Facilities, as part of the Hong Kong-Zhuhai-Macao Bridge Project. Fibre network has now been extended to new railway stations such as the MTR's Express Rail link, South Island Line and Kwun Tong Line Extension.

In addition, FTTH and FTTO services, along with "HGC On Air" Wi-Fi hotspots and data centres, are being made available by a 100G fibre backbone network throughout Hong Kong Island, Kowloon and the New Territories. This enhanced infrastructure now supports more than 25,000 Wi-Fi hotspots - many served by a 1Gbps fibre backhaul facility - making HGC one of the largest-scale Wi-Fi service providers in Hong Kong.

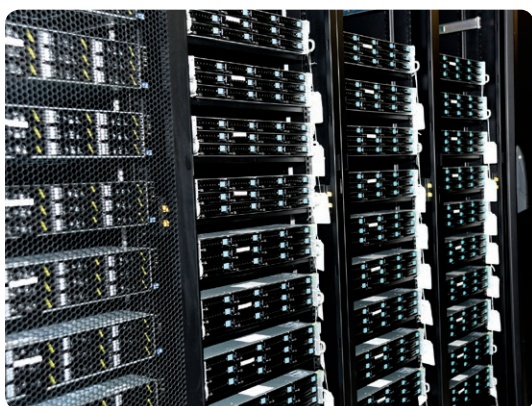
## International and Local Carrier Market

As one of Asia's leading telecommunications players, HGC has progressed from infrastructure-based carrier to a solutions-centric provider expanding into new market and customer segments, while enriching a global service portfolio in horizontal and vertical terms.



From a horizontal perspective, business reach now extends to every continent in the world, with a particular focus in developing countries. In addition, HGC is penetrating into corporate customers in various industries overseas. It is also co-operating with companies within 3 Group to develop enterprise market opportunities using fixed-and-mobile bundling solutions in geographies such as Europe.

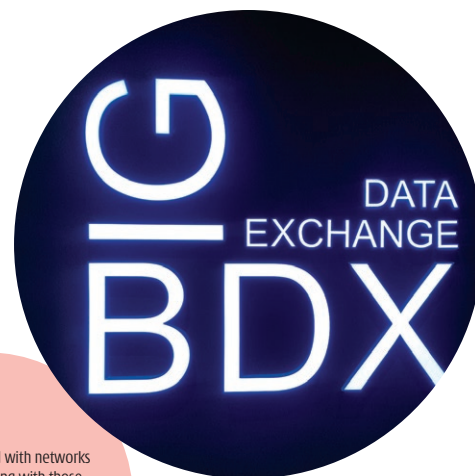
Turning to the vertical aspect, business models that rely on big data and the ability to operate dynamically have prompted HGC to strengthen its capabilities in related areas. These involve private and public cloud computing, cloud connectivity and one-stop solutions with colocation facilities and managed services.



• A server storage service offered by HGC's BDX has been kept busy meeting rising demand.

Carriers are using HGC's public cloud solution to capitalise on upwardly-spiralling demand in their own markets. HGC offers standard and customised private cloud solutions to meet the needs of corporate customers. It also collaborates with providers to offer public cloud connectivity around the world that satisfies dynamic IT requirements with the utmost flexibility.

BDX is our innovative solution to address the need of OTT players, content and game providers and IT developers.



• The BDX is peered with networks in Hong Kong, along with those run by international carriers, data centres and Internet exchanges around the world.

BDX solutions bundles hardware, software, managed services, premium Internet access and cloud connectivity, as well as server farm design to grant flexibility and efficiency for organisations of all sizes and types.

Meanwhile, HGC is capitalising on rising usage of mobile data and smart devices by tailoring solutions to the requirements of mobile network operators. In addition to serving the 3 Group companies, for example, HGC's Internet Packet Exchange solution meets the end-to-end needs of mobile network operators seeking to exchange all forms of mobile traffic. HGC established group-to-group IPX peering with operators and related mobile network communities in order to help widen coverage and raise service levels above those of traditional IPX offerings.

HGC acts as a voice gateway for 3 Group companies to exchange traffic with other mobile operators. It facilitates all the on-net and off-net traffic exchange to promote quality and efficiency. HGC is also engaged in delivering OTT traffic to the rest of the world while running its own Voice-over-Internet-Protocol application as a VAS to meet changing customer requirements.

HGC now benefits from voice interconnections with more than 400 carriers, along with direct mobile connections to 200-plus mobile operators in some 100 countries and video coverage in 59 nations via 160 carriers.

HGC leads the Hong Kong market as a provider of backhaul services that connect local mobile operators seeking to satisfy an ever-increasing appetite for data among their customers. Such demand has increased sharply with the advent of 4G LTE service, which requires high bandwidth to carry data at markedly higher speeds. Our solution was launch of Gigabit Access Network service, which provides carriers with bandwidth up to 1Gbps per mobile base-station for backhaul purposes. Cell-site expansion of Gigabit Access Network positions HGC ideally for the forthcoming 5G era.

Advances in Dense Wavelength Division Multiplexing technology have enabled HGC to equip mobile operators with cost-effective Dense Wavelength Division Multiplexing multiple 10G connectivity as a "mobile fronthaul" service. The upshot is mobile operators are able to reduce the cost of renting cell-sites, while centralising mobile base-band units at hub sites and distributing remote-radio units via front-haul link of HGC. At the same time, HGC also provides backhaul links to facilitate mobile operators to deploy small cells indoor and outdoor in locations such as food chains and retail shops to enhance further coverage.

### Corporate and Business Market

HGC owns and runs an extensive network that provides financial institutions, government departments, schools, hospitals and other organisations with a variety of solutions.

Segments served include insurance, manufacturing, logistics, engineering and professional services, all of which drove new business opportunities in 2016. Meanwhile, ongoing development of cloud and managed services assisted the process of IT transformation for customer organisations, while creating revenue streams other than from traditional connectivity activities.

HGC's bizCloud offering was upgraded to a premium bizCloud 2.0 version in early 2016, enabling corporations to respond dynamically to ever-changing market conditions by gaining flexible access to computing, storage and network resources. Launch of the one-stop enterprise-grade Cloud Backup Service in July 2016 enables enterprises to backup files, operating systems and applications securely, flexibly and cost-effectively on a Backup-as-a-Service basis.

Collaboration with shopping malls saw deployment of a large-scale Wi-Fi network that now serves millions of shoppers and visitors. The move reinforces HGC's leadership in providing Wi-Fi throughout major shopping clusters via its 1Gbps optical-fibre backhaul infrastructure.

HGC launched FTTO in response to demand from schools for high-speed broadband. This innovative technology delivers fibre services via passive optical components, at speeds up to 1Gbps, while helping to generate loyalty and a long-term relationship with the education community.



- HGC's bizCloud 2.0 cloud solution comes complete with a self-management portal.



- 3Home Broadband serves the residential market with high-speed internet access to facilitate "better living" among users.

## Residential Market

High-speed broadband Internet services continued to be HGC's residential focus and featured FTTH speeds ranging from 100Mbps to 1Gbps. Widespread provision of Gigabit Internet service via FTTH technology is being extended to all major estates and buildings, especially in the high-end residential segment. In fact, HGC established a premium sales team to address top-tier residential customers. At the end of December 2016, HGC's broadband coverage amounted to more than 1.8 million home-passes.

In order to satisfy a growing appetite for infotainment and OTT services, HGC has collaborated with various industry leaders to offer a superior customer experience. In 2016, HGC bundled fixed-line service offerings with a connection device that has resulted in an enriched home entertainment experience for our residential customers. This was taken a step further when HGC collaborated with content leaders to offer TV programmes bundled with drama and sports content as part of a value-for-money package.



- The Group's Watson Centre facility has been accredited with the ISO 50001 energy management standard.



## Data Centre Market

HGCCC owns two data centres, designed to the TIA-942 (Telecommunications Industry Association), tier-3, or higher, standard. HGCGC provides comprehensive redundancy solutions and critical application-hosting solutions that come complete with comprehensive cloud and IT management services for corporate customers.

The Watson Centre data centre has been accredited with ISO 27001 information security management and ISO 50001 energy management certification to facilitate HGCGC's sustainable development in this growing industry.