Disclaimer

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

The Management Team

Strong in-depth industry knowledge with track record to deliver

Peter Wong
Chief Executive Officer

Jennifer Tan
Chief Operating Officer

Suzanne Cheng
Chief Financial Officer

Andrew Kwok
President, International
& Carrier Business

Daniel Chung
Chief Technology Officer
IT & Mobile

Byron Chiang
Chief Technology Officer
Fixed

Raymond Ho
Corporate & Marketing
Communications Director

Edward Wong
HR & Organisational
Development Director

Wai Ming Ho
HTMCL - CEO

Edmund Yick
General Manager
Enterprise Market

Dennis Wong
General Manager
Corporate Sales, Fixed

YC Lee
Head of Data Centre

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Contents

1) **HTHKH - An Integrated Operator**
   - Global Integrated Telco
   - Well Recognised – Innovation & Services
   - Investment ⇨ Solid Foundation ⇨ Future Growth
   - True Quad-play Operator

2) **Transformation & Opportunities**
   - Business Transformation
   - Growing Markets
   - Potential Value of IoT by 2025
   - Win with Partners

Making **Better**

Hutchison Telecom Hong Kong Holdings
和 記 電 訊 香 港 控 股

HTHKH
An Integrated Operator
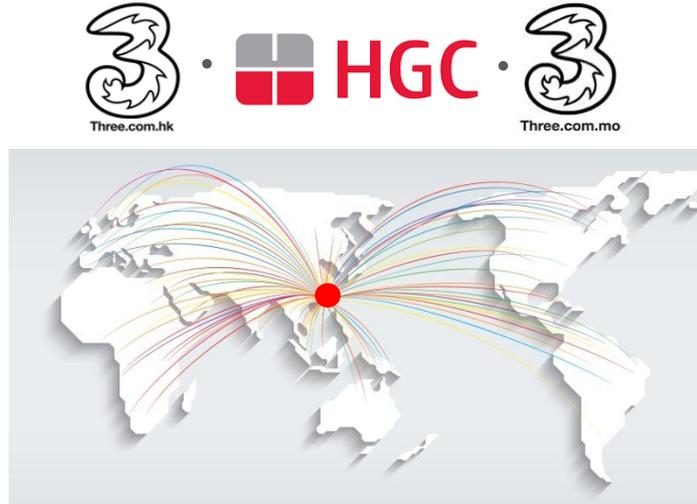
Global Integrated Telco

Group affiliates

3 GLOBAL

UK
Italy
Ireland
Austria
Sweden
Denmark
Indonesia
Vietnam
Sri Lanka
Australia

**Local based
Global scale**

3 · HGC · 3
Three.com.hk   Three.com.mo

21 Global Offices

Mobile alliances

CONEXUS

VNPT   true
docomo   StarHub
kt   FarEastone 遠傳
SMART   indosat ooredoo

Making**Better**

Well Recognised – Innovation & Services

2015 36

2016 1H 20

International Customer Relationship Excellence Award
➤ **Contact Center of the Year**
➤ **People Development Program of the Year**

International Alternative Investment Review Awards
Company of the year for Innovation & Over-the-Top Leadership- Asia

Smiling Enterprise Award
➤ **Outstanding Smiling Enterprise Award**
➤ **Outstanding Smiling Staff Awards**
➤ **Smiling Staff Awards**

Asia Pacific Stevie Awards
➤ **Gold: Award for Innovation in Technology Management, Planning and Implementation**
➤ **Bronze: Award for Innovation in B2B Services**

Mob-Ex Awards
➤ **Silver: Best Mobile Site**
➤ **Bronze: Best App – Creative Design**

Hong Kong ICT Awards
Best Smart HK Gold Award: Big Data Application

Making **Better**

Investment ⇨ Solid Foundation ⇨ Future Growth

Spectrum	**154.4MHz***	900/1800/2100/ 2300/2600 full range
WiFi	**20,000+ Hotspots**	
Fibre Length	**1.43 million Kilometres of Fibre Optic Cable Cores** (enough to circle the earth about 36 times)	
Homepass	**Over 2 millions by 2017**	
Global Offices	**21 Offices**	
Point of Sales	**60+ 3Shops** **320+ Retail Sales Force** **100+ Dealer Outlets**	**345+ Corporate/ Enterprise & Direct Sales** **~300 International Staff**
Major Data Centres	**2 IDCs** **(Tier 3/3+)** **175,000** **Sq ft.**	**1,800+** **Racks**

*40MHz shared through 50/50 JV under Genius Brand Limited

Making**Better**

True Quad-play Operator

Customer Stickiness ⬆

Revenue ⬆

Operating Cost ⬇

Fixed Mobile Convergence

- myTV SUPER - broadband Plan/FMI tailored offer
- Attractive bundle offer - Google Chromecast
- International Business
- Fixed
- Mobile
- Quad -play
- WiFi
- LTE mobile & WiFi bundle Fixed free 100 min WiFi
- Content/ Application
- WhatsApp KKBox myTV SUPER LeSports

Making**Better**
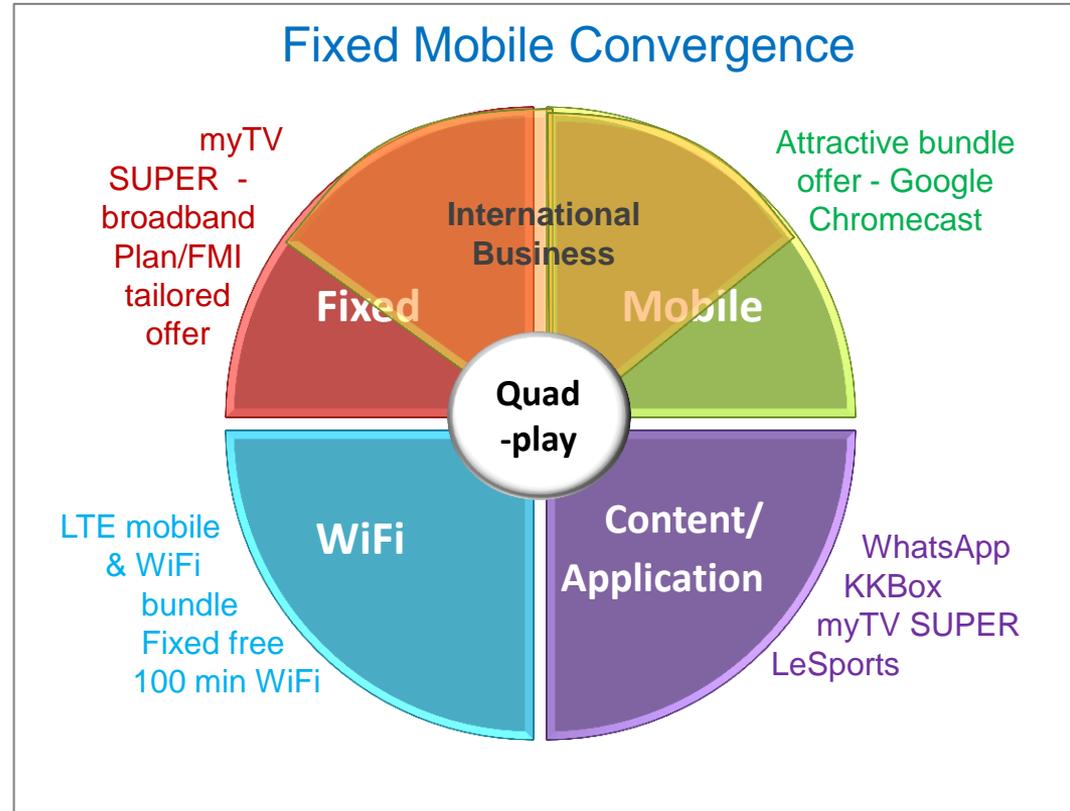
Transformation & Opportunities

Business Transformation

Infrastructure Based (Connectivity)

Limited
Applications

Service
Platforms

Core Network

Fixed Local Fibre ▪ Submarine
Cable ▪ WiFi ▪ Mobile Radio &
Cell Sites
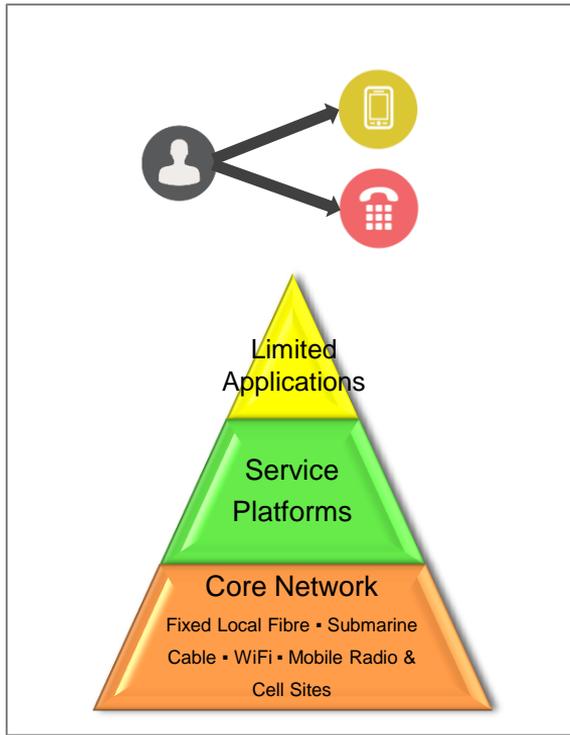
Service/ Customer Experience Based

CONNECT PEOPLE

B2B
communications
E-Commerce

P2P
communications
Mobile Payment

CONNECT DEVICES

TV apps   Music apps   Movie apps   Sports apps

Applications

Open Platform

Integrated IP Networks

Private Network
Public Network IP Transit

Core Network

Making**Better**

Hutchison Telecom Hong Kong Holdings
和 記 電 訊 香 港 控 股
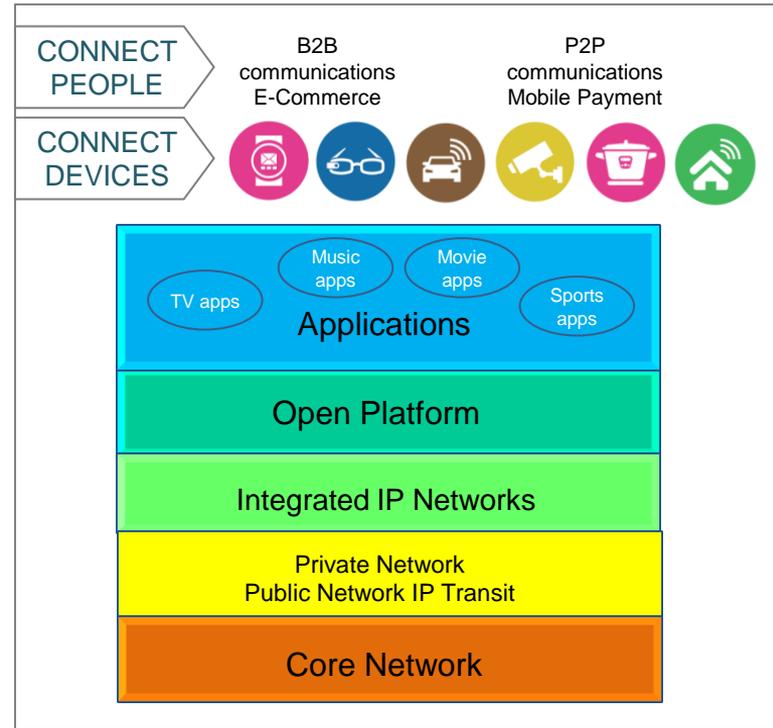
Growing Markets

TRADITIONAL MARKET

Communication Focus :

- Voice
- Data
- Roaming, IDD
- SMS, MMS, IMS

UNTAPPED/ NEW MARKETS

- Convergence Market
- Under-exploited Traveller Business (Apple SIM)
- Carrier Billing (Google, iTune)
- OTT (myTV SUPER, LeSports, KKBox, etc.)
- Mobile Payment (Mobile wallet, P2P, P2B, B2B)
- IoT (B2B, B2C, M2M)
- Big Data
- Advertising

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Win with Partners

Powerful Network

- Fixed Local
- Submarine Cable Capacity
- Mobile Radio & Cell Site Coverage
- WiFi
- Group Affiliates
- Global Alliances

Know our Customers

- Profile Demographic
- Location Info
- Behavioural Data
  - Individual
  - Household
- Time Serial Info

Reach our Customers

- Extensive Retail Network
- Corporate/ Enterprise & Direct sales Force
- Customer Hotline & Service Points
- Digital Forum & Community

Powerful Billing for Customers

- Solid Charging Relations
- Valid Billing Address & Charging Channels
- Credit Health Record

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Mobile Network

Spectrum

ONLY mobile operator in Hong Kong to possess **FULL** set of FDD&TDD spectrum bands portfolio

900MHz (FDD)

1800MHz (FDD)

2300MHz (TDD)

Spectrum Portfolio

2100MHz (FDD)

2600MHz (FDD)

2G
3G
4G (LTE, LTE-A)

5G

Making**Better**
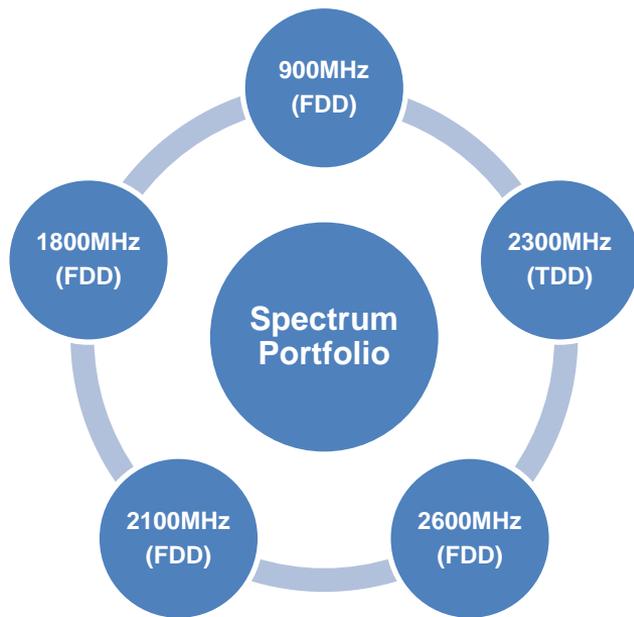
Coverage

Spectrum Refarming

900 MHz
- Ideal for LTE **coverage** enhancement, especially at indoor buildings
- Excellent for improvement of service quality and continuity, such as VoLTE

2100 MHz
- Ideal for LTE **capacity** enhancement
- Pave way for LTE-A 4CC/5CC CA
- Excellent for improvement of service quality & user experience, e.g. video application
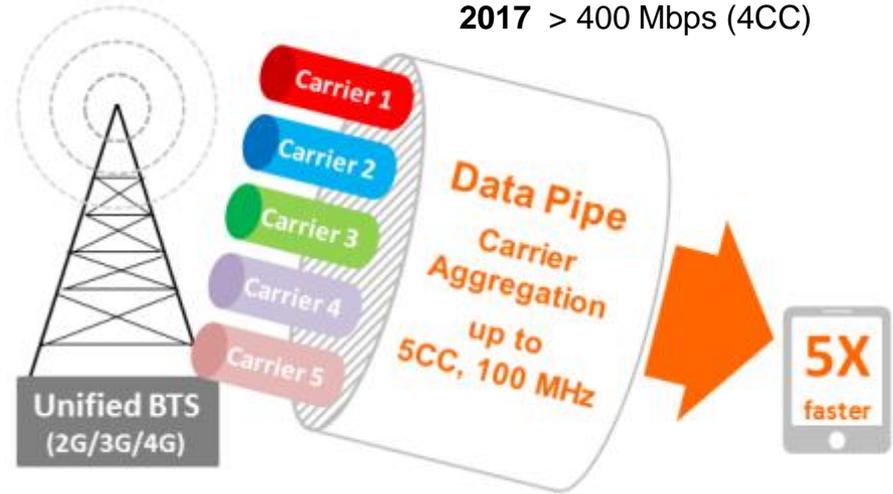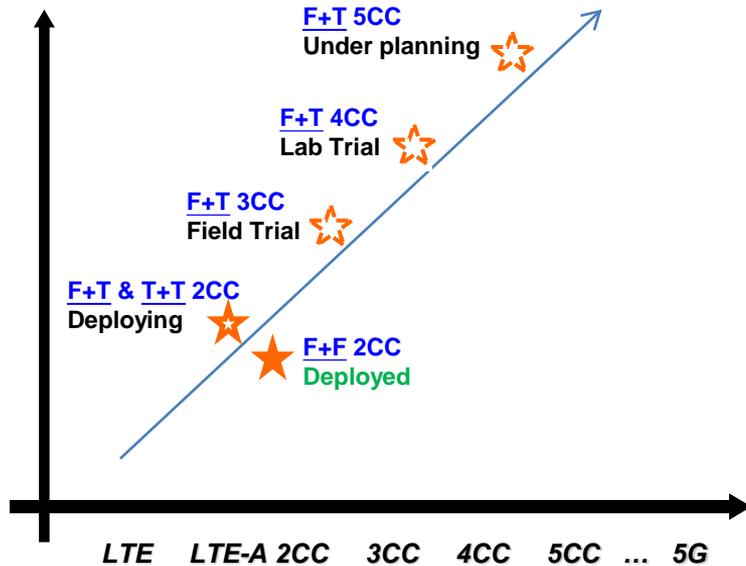
Wi-Fi Service

One of Hong Kong's largest commercial Wi-Fi networks, with more than 20,000 hotspots

Making **Better**

Data Speeds

Data Speed

F+T 5CC
Under planning ☆

F+T 4CC
Lab Trial ☆

F+T 3CC
Field Trial ☆

F+T & T+T 2CC
Deploying ☆

F+F 2CC
Deployed ★

LTE   LTE-A 2CC   3CC   4CC   5CC … 5G

2015 > 200 Mbps (2CC)

2016 > 300 Mbps (3CC)

2017 > 400 Mbps (4CC)

Carrier 1
Carrier 2
Carrier 3
Carrier 4
Carrier 5

Data Pipe
Carrier Aggregation up to 5CC, 100 MHz

Unified BTS
(2G/3G/4G)

5X faster

Carrier Aggregation (CA)

- *3GPP standard defines up to 5 component carriers (CC) in the LTE-Advanced (LTE-A) technology*

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Services

Voice over LTE (VoLTE) and *Voice over Wi-Fi (VoWiFi)*

IMS-based Multi-devices Access

- Incoming calls at phone numbers associated with multi-devices (SIM based and non-SIM based)

- Ringing at multi-devices simultaneously

- Call session handover among multi-devices during the call without interruption

Multi-devices

Living room

Bedroom

Study room

Gym room

Wi-Fi hotspot

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股
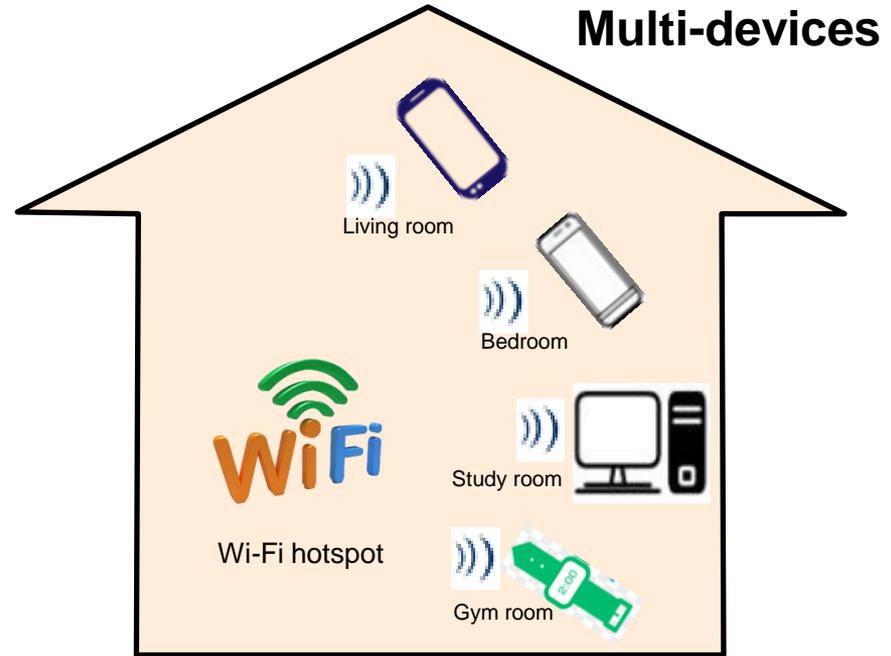
Small Cell

- Fit coverage holes and traffic hotspots (small area but large quantity)

- Flexible installation locations

- Improved effective user quantity, throughput (downlink & uplink), latency and battery consumption

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

# Innovative
Business Opportunities

Big Data - Mobile Operator's Data Monetisation

- Large mobile internet advertisement spending worldwide

- Mobile operator's data becomes extremely valuable for innovative business model

- Various internal and third party data and user cases through a single network integration

Making **Better**

Evolution to 5G

5G – Technical Requirements

- **eMBB:**

  Speed & Capacity

- **Massive IoT:**

  Connections & Energy

- **Critical:**

  Latency & Reliability
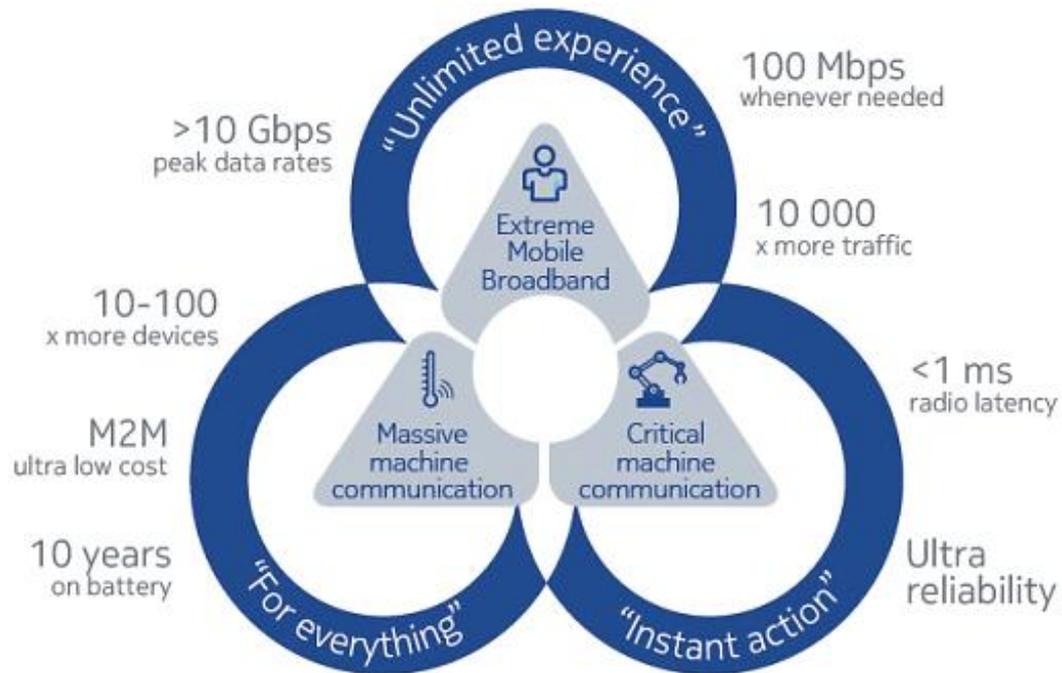
Making **Better**

Contents

1) Fixed Network Infrastructure
- Evolution of Communications
- Network Infrastructure
- IDC
- "hgc on air" Wi-Fi Service

2) Future Development
- Big Data
- IoT
- Business Solutions
- Focus

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Everything Built on the Fibre Layer


Making **Better**

Fibre / IP Network Infrastructure

- Over 1,430,000 km of fibre-optic cable cores

- Over 5,990 km of cable ducts

- Currently over 1,820,000 homepass

- ~ 5,000 FTTB non-residential buildings

- Extensive IP network generating massive customer behaviour data

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Commercial Network

- Flat nature

- Optimise for peer-to-peer connectivity

- No major difference between active and backup path

- Requires careful fibre cable network design
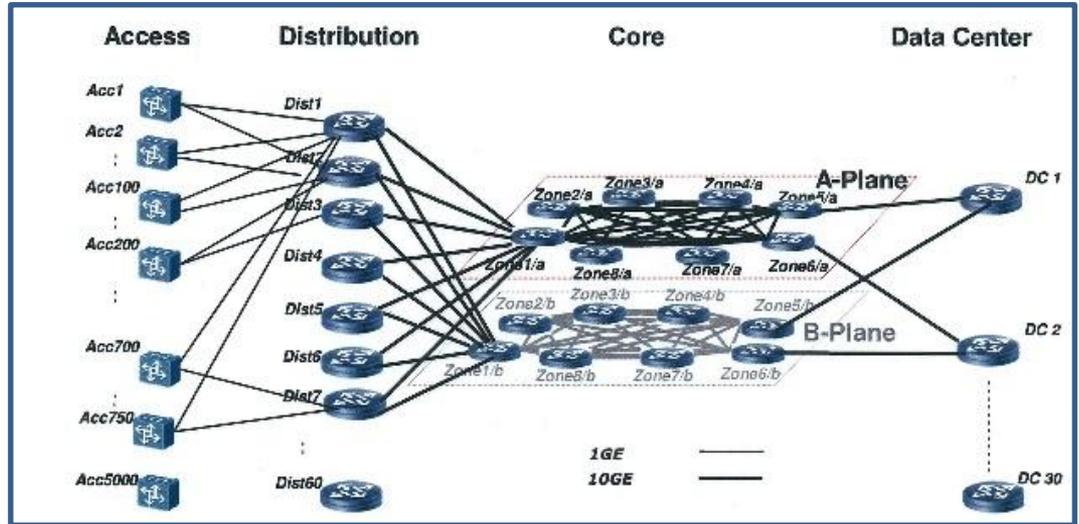
Broadband (ISP) Network

- Hierarchical nature (to internet)

- Optimise for top-to-bottom connectivity

- As more buildings are added, latency increases proportional to log(n)

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

… the risk

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股
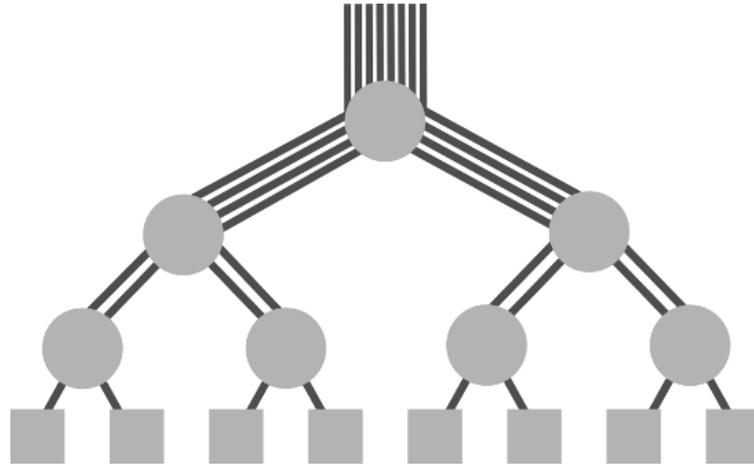
IDC – Extended Network Infrastructure

Only tier III data centre provider to offer:

- Group self-owned property

- Complete power resiliency – supplied by HKE & CLP

- Comprehensive network coverage

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

IDC – Technical Summary

	Cavendish Data Centre	Watson Data Centre
Data Center Tier Classifications	Tier 3+	Tier 3
No. of Cabinets	1,160	710 + 1,000 planned in 2016
IT Power Capacity	5,000kVA	2,000kVA + 3,000kVA planned in 2017
Racks and Cages	600mm or 800mm wide, 45U height and up to 1200mm deep cabinets Private Cage can be custom made	
Raised Floor	600mm	
Electrical	UPS & PDU : 2N Generator : 2N Transformer : 2N	UPS & PDU : 2N Generator : N+1 Transformer : N+1
Mechanical	CRAC : N+20% Chiller : N+1 Cooling Tower : N+1	CRAC : N+20% Chillers : N+1 Cooling Tower : N+1
Telecommunication	Carrier neutral Dual lead-in, dual risers, and dual telecom rooms	
Fire Suppression	FM200 gas suppression system	
Cabling	AC Power under raised floor Telecom copper/fiber run on ceiling level cable basket	

Making**Better**

hgc on air – One of the Largest Wi-Fi Networks in HK

- 20,000+ Wi-Fi hotspots throughout Hong Kong

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Expansion Strategy

- Venues for events

- Hotspots for money transaction

- With useful big data

Festival Walk
Hysan Place
Jimmy's Kitchen
Joy & Joy
Link REIT
Midtown
Olympian City
The Peak Lookout
TMT Plaza

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Telco Big Data

- With network, subscribers & app data

- Wi-Fi provides excellent data source

- Smartphones create billions of touchpoints

  - Improve user experience within a venue

  - Increase operational efficiency of a venue

  - Monetise location information

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

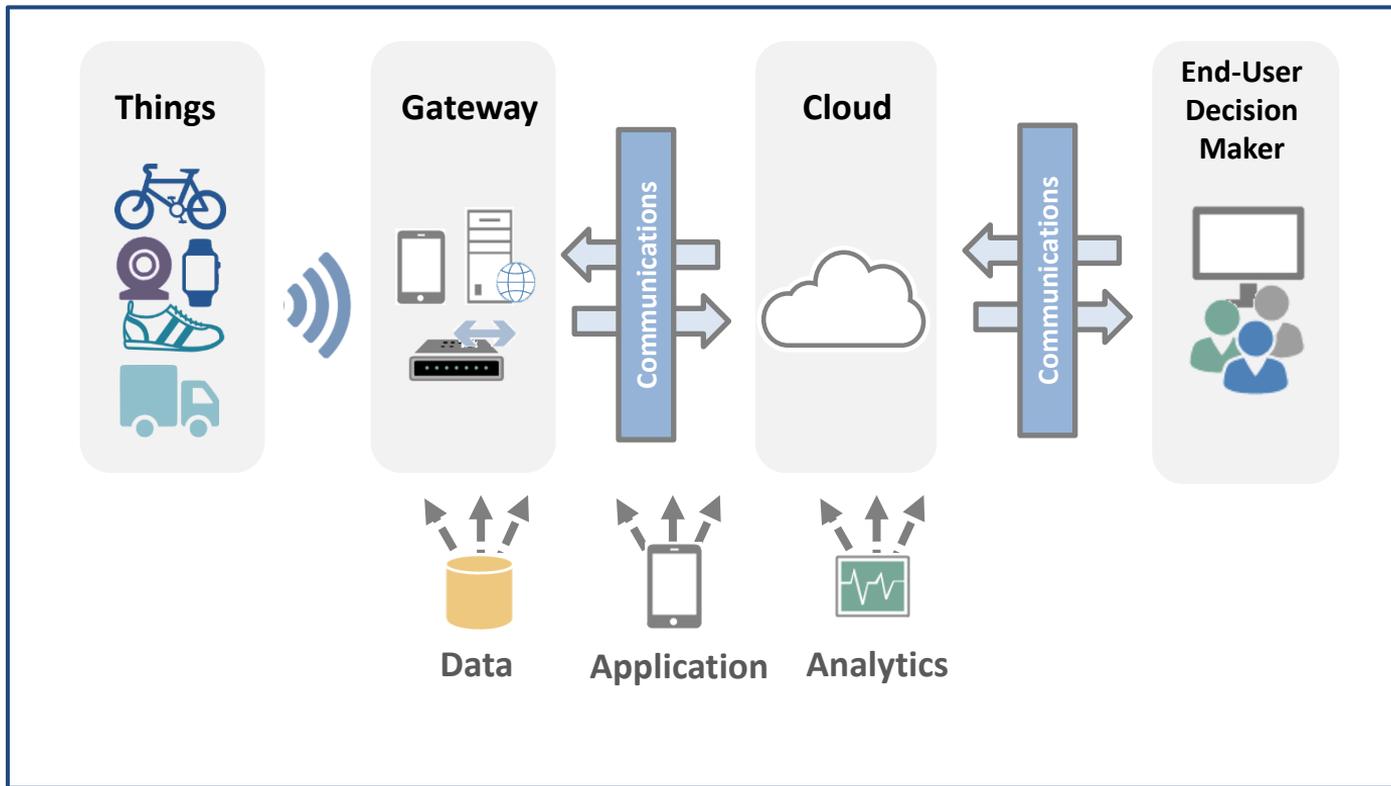# Functional Menu of a Shopping Mall Partner

- Heatmap report

- Number of unique visitors

- User average dwell time

- Repeated visitors percentage

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Cooperation with Smartac

- HGC and Solomedia Asia, a subsidiary of Smartac Group, intend to build "Smart Travel Cloud" in Hong Kong

- Easy use of Wi-Fi networks while abroad

- Solomedia Asia will deploy an O2O big data platform (combining Wi-Fi, bluetooth Beacon, smart interactive screen) to provide visitors with personalised and interactive information

- Initialising 'Internet + Tourist Consumption'

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

IoT – Leveraging Network & Cloud Infrastructure

Things

Gateway

Communications

Cloud

Communications

End-User Decision Maker

Data

Application

Analytics

Focus

- Both Big Data and IoT present new revenue generating opportunities for monetising telco insights we have been sitting on with regard to our customers and the use of our fixed, mobile and Wi-Fi networks

- IoT increase of digital surface present opportunities to HGC extending from the bandwidth business

- AI & robotics technology will be a key component of our omni-channel strategy from both cost/operation optimisation and customer experience improvement perspective

Making **Better**

Andrew Kwok
International and Carrier Business
Director

Contents

1) **Global Expansion & Future Revenue**
   - Hong Kong Carrier Business
   - International Data and Voice Business
   - International Mobile Services

2) **Digital Evolution – Telco Suite Platform**
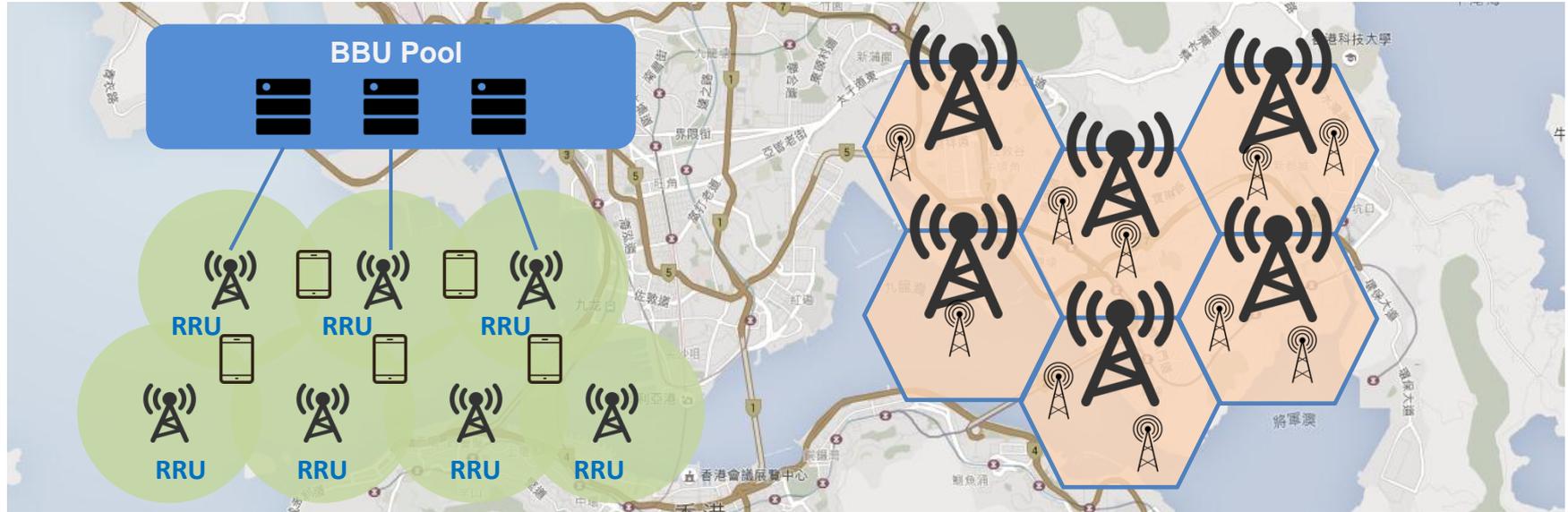
3) **Big Data Exchange (BDX)**

Making **Better**

Hutchison Telecom Hong Kong Holdings
和 記 電 訊 香 港 控 股

Hong Kong
Carrier Business

Business Expansion

Mobile Front-haul

Small Cell
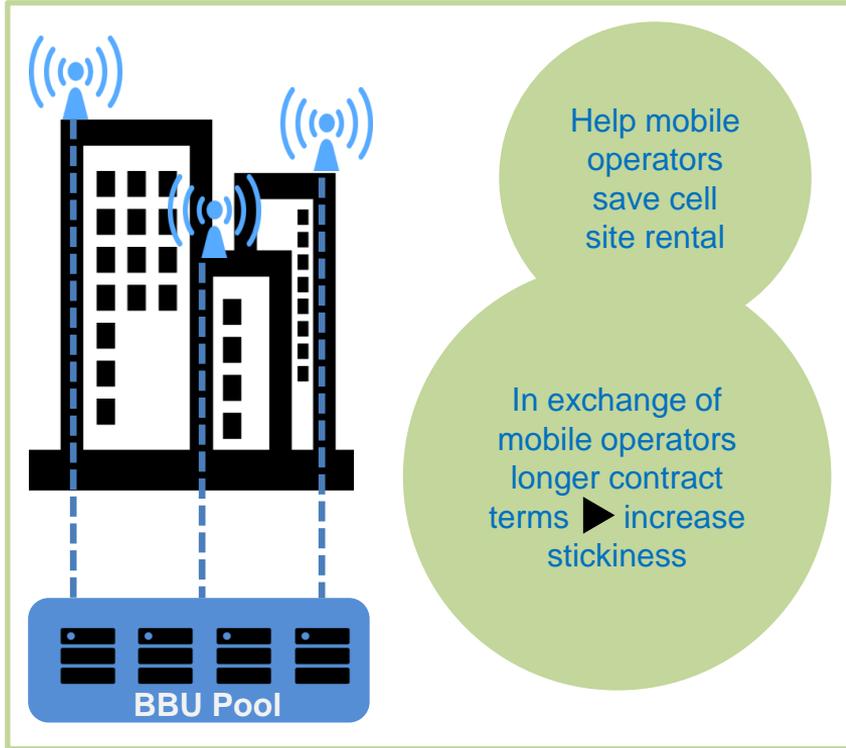
BBU Pool

RRU RRU RRU

RRU RRU RRU RRU

- Save mobile cell site rental & power consumption
- Save CAPEX on cell sites
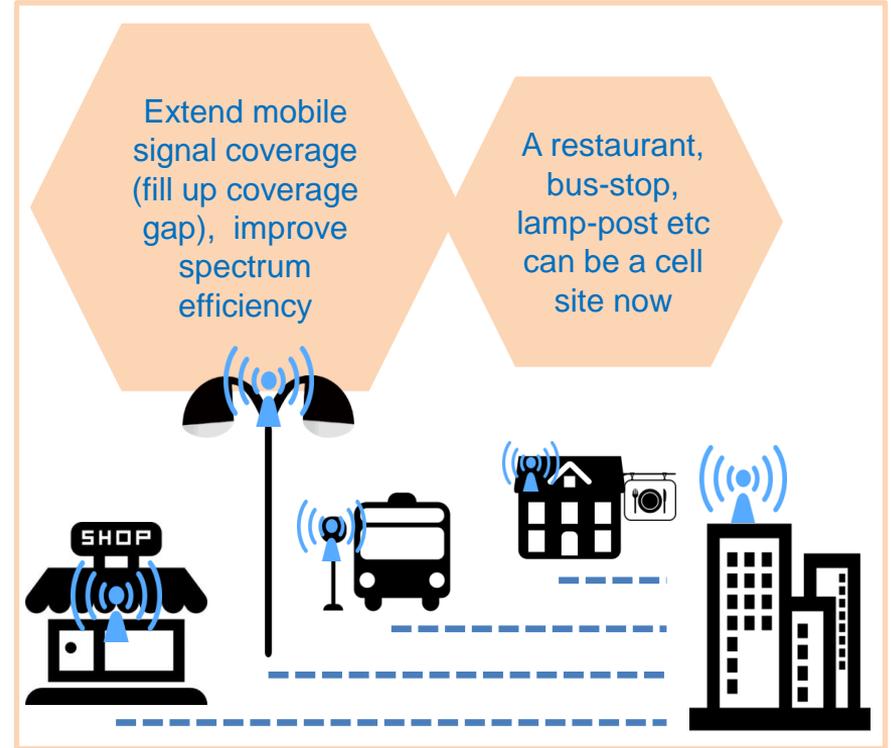- Extend mobile coverage
- Improve spectrum efficiency

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記 電訊 香港 控股

Revenue Stream

Mobile Front-haul

Small Cell

Help mobile operators save cell site rental

In exchange of mobile operators longer contract terms ▶ increase stickiness

BBU Pool

Extend mobile signal coverage (fill up coverage gap), improve spectrum efficiency

A restaurant, bus-stop, lamp-post etc can be a cell site now

SHOP

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

International Data and Voice

International Data and Voice

Widespread footprint in Asia & span the globe

Making **Better**

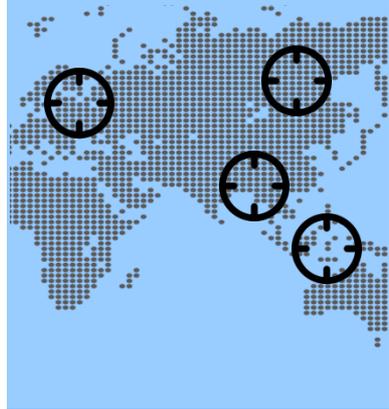Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Global Presence and Expansion
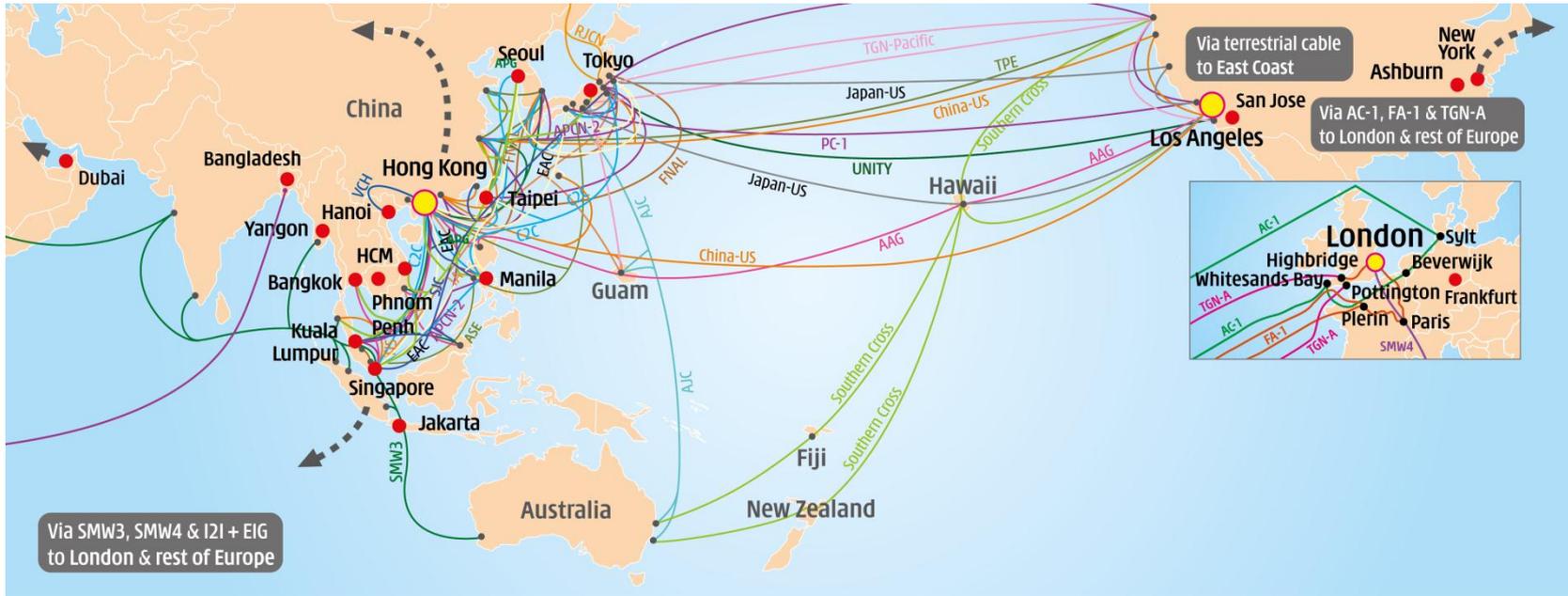
- Group gateway for CKHH's mobile traffic
- Expand corporate solution to Europe
- Evolve voice to IP, apps & application messaging

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Revenue Stream

International Wholesales Data

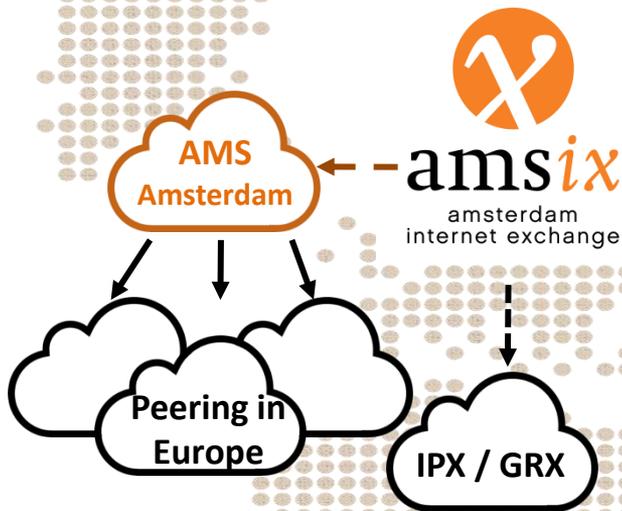| Carrier of carrier specialised in niche markets	Content delivery for mobile & OTT	Cloud connectivity e.g. Amazon	Asia expansion with leading Internet Exchange e.g. AMS-IX

AMS-IX Hong Kong

- **World's largest IX**
- **Independent IX based in Amsterdam**

Asia partnership

AMS Amsterdam

Peering in Europe

IPX / GRX

AMS-IX HK

ISP customer

Peering In Asia
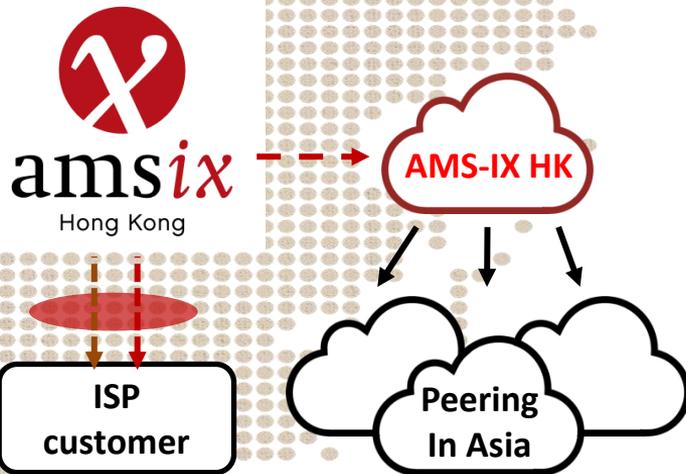
Benefits to HGC
- **Pioneer as global IX in Asia**
- **Strengthen HGC as an international hub**
- **Aggregate OTTs & contents**
- **Add values to pure bandwidth business**

Making**Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Revenue Stream

International Enterprise

ICT solution for OTT & enterprise	**Private cloud solution**	**Big Data Exchange (BDX) for IoT, startups & app developers**

HGC ibizCloud

BIG DATA EXCHANGE BDX

Revenue Stream

International Wholesales Voice / Messaging

Bridging OTT with traditional carriers

A2P SMS authentication

Gateway of CKHH's 11 mobile operations

Making**Better**
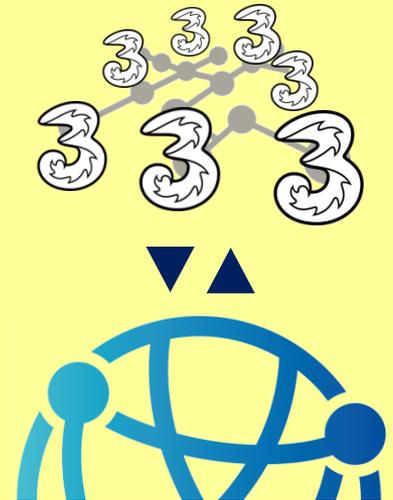
International Mobile

International Mobile

Expand Mobile Global Reach

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Global Presence and Expansion

- Joint hands with CKHH's mobile operations for group to group deal
- Global MVNO initiatives with CKHH's mobile operations
- Collaborate with Conexus Alliance on enterprise solution

Making **Better**

Revenue Stream

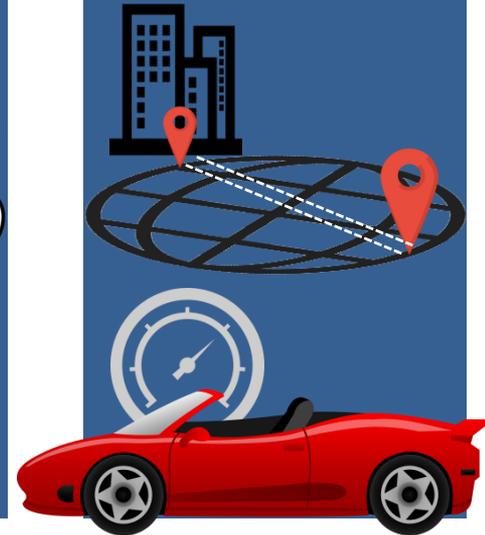Evolve from roaming business to traveler business

Global prepaid business & digital market

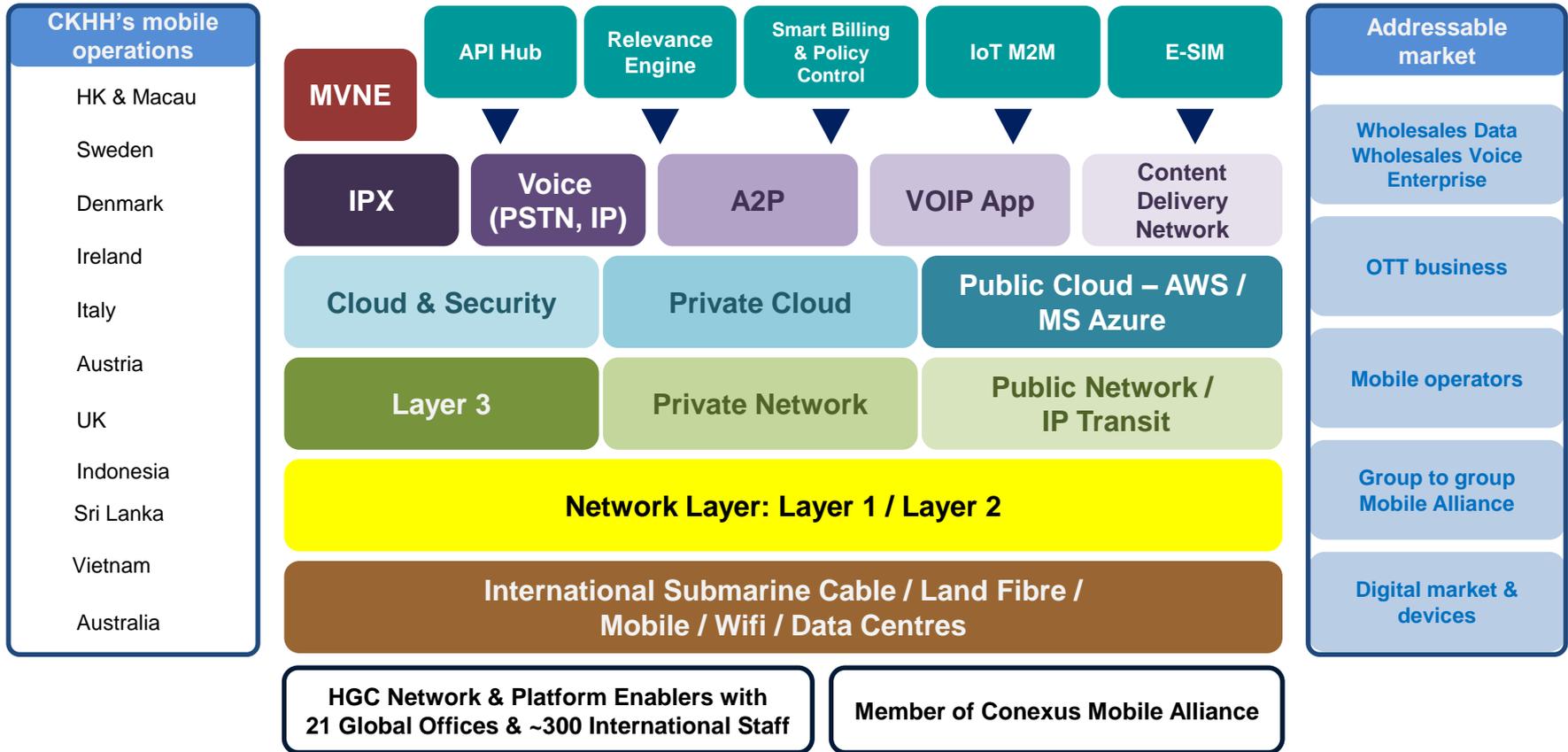CKHH's mobile operations & Conexus: Enterprise solution

International M2M solution & IoT

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Digital Evolution
Telco Suite Platform

Digital Evolution – Telco Suite Platform

CKHH's mobile operations

- HK & Macau
- Sweden
- Denmark
- Ireland
- Italy
- Austria
- UK
- Indonesia
- Sri Lanka
- Vietnam
- Australia

MVNE

| API Hub | Relevance Engine | Smart Billing & Policy Control | IoT M2M | E-SIM |

| IPX | Voice (PSTN, IP) | A2P | VOIP App | Content Delivery Network |

| Cloud & Security | Private Cloud | Public Cloud – AWS / MS Azure |

| Layer 3 | Private Network | Public Network / IP Transit |

Network Layer: Layer 1 / Layer 2

International Submarine Cable / Land Fibre / Mobile / Wifi / Data Centres

Addressable market

- **Wholesales Data Wholesales Voice Enterprise**
- **OTT business**
- **Mobile operators**
- **Group to group Mobile Alliance**
- **Digital market & devices**

HGC Network & Platform Enablers with 21 Global Offices & ~300 International Staff

Member of Conexus Mobile Alliance

Making **Better**

Hutchison Telecom Hong Kong Holdings
和記電訊香港控股

Q & A

Thank You