# A **Cost-Effective** Fixed and Mobile Broadband Deployment **Methodology** for

## Bridging the Broadband Gap


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# Korea, Global No.1 ICT Frontier

## Korea is one of the most advanced countries in ICT Development Index

### ICT Development Index

| IDI 2015 | Economy |
|---|---|
| 1 | Korea (Rep.) |
| 2 | Denmark |
| 3 | Iceland |
| 4 | United Kingdom |
| 5 | Sweden |

※ Source: ITU ICT Development Index 2015

### World #1 Services

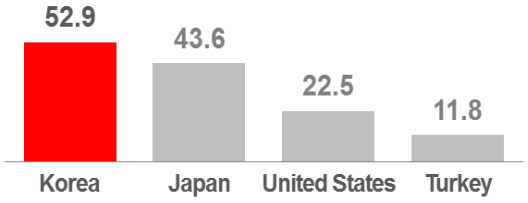
- **LTE** penetration #1
- **Fixed** average speed #1
- World-first **UHD IPTV** #1
- **Smartphone** penetration #1
- **FTTH/FTTB** penetration #1
- World-first **Nationwide Gigabit Internet** #1

### Korea ICT Overview

**Top 3 4G LTE Coverage**


[Source: OpenSignal Q4 2015]

**Fixed Broadband Speed**




[Source: OECD Communication outlook 2015]
Actual download speed (Mbps)

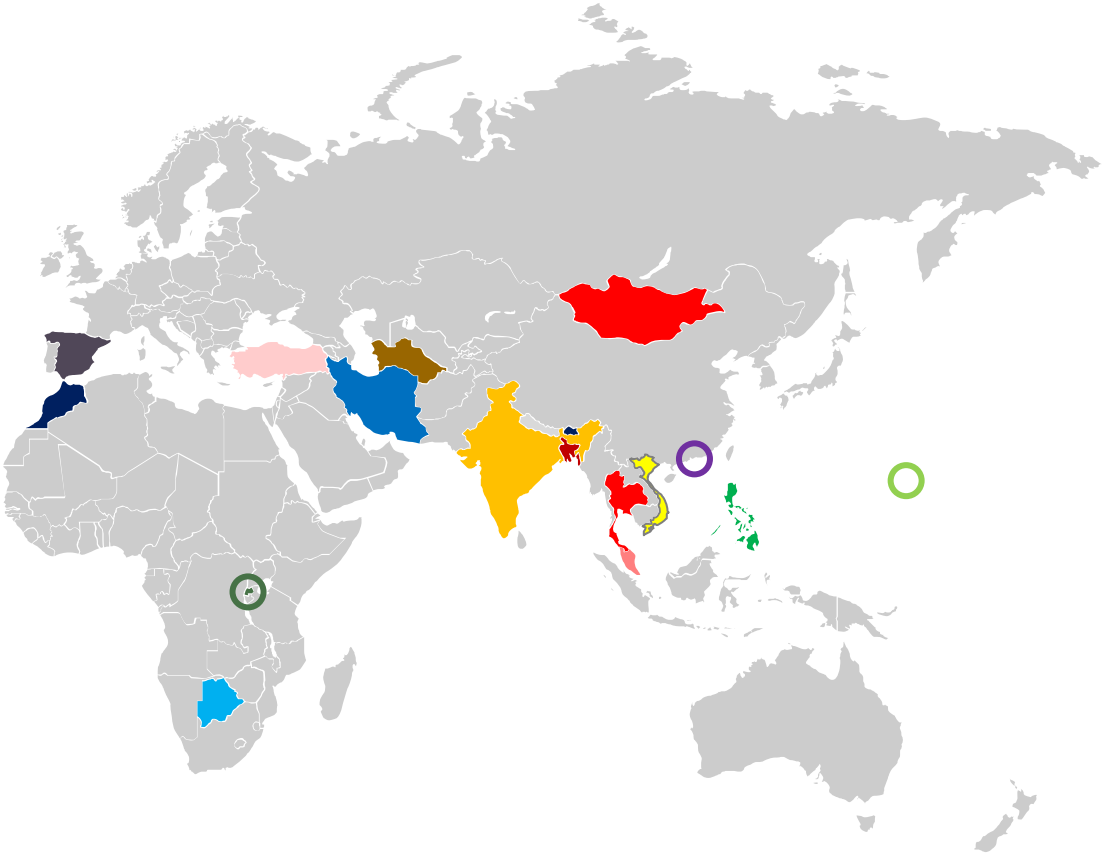
**Top 4 Mobile Data Usage**

| | |
|---|---|
| Finland | 4.2 GB |
| Sweden | 2.6 GB |
| **Korea** | **2.2 GB** |
| Japan | 1.9 GB |

[Source: tefficient H1 2015]
Data usage per subscriber in a month

# KT Global Reference: Network Consulting

## KT has provided optimum solutions for fixed and mobile networks from strategy establishment to operation methodology



**17** Countries

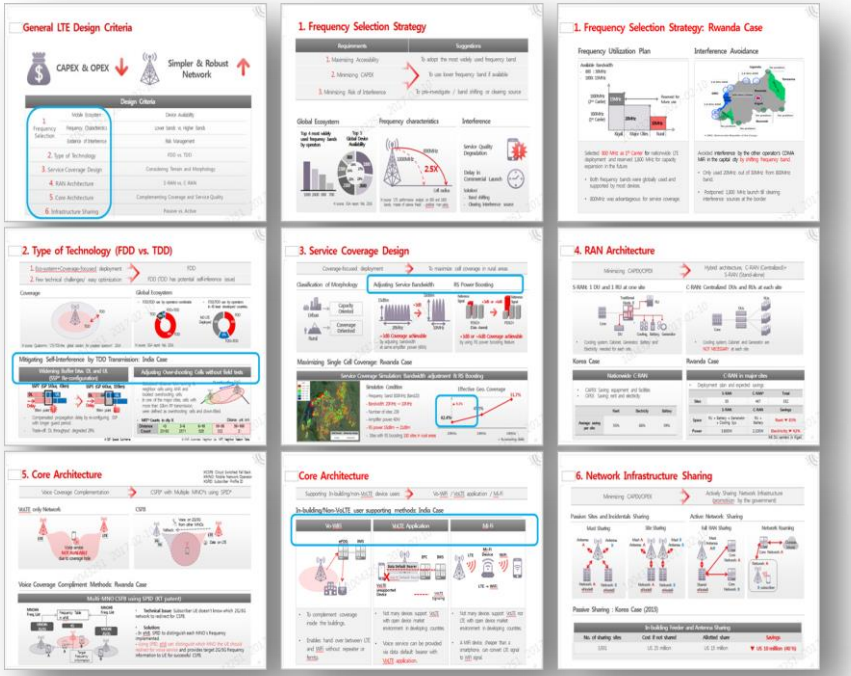
**96** Projects

- Bangladesh
- Bhutan
- Botswana
- Guam
- Hong Kong
- India
- Iran
- Malaysia
- Mongolia
- Morocco
- Philippines
- Rwanda
- Spain
- Thailand
- Turkey
- Uzbekistan
- Vietnam

# A Cost-Effective Mobile BB Network Design and Deployment Methodology

## 2016 ITU RDF-ASP the Philippines

- ✓ Frequency Selection Strategy
- ✓ Duplexing Technology Selection
- ✓ Coverage Expansion Methodology
- ✓ RAN Architecture
- ✓ Core Architecture (VoLTE Implementation)
- ✓ Network Sharing



# Giga Broadband Era

## We are on the way to 100% Giga internet by 2020

Cloud

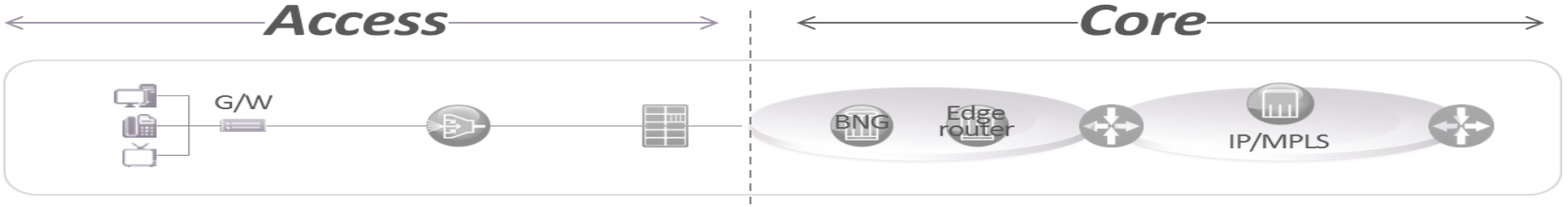

UHD


IoT


VR/AR

Traffic growth

## Telco's Network Challenges




**1. Coverage Expansion**
*with minimized cost*

**2. Bandwidth Evolution**
*with minimized cost*

**3. Network Convergence**
*with operation efficiency*

# 1. Coverage Expansion: Strategy

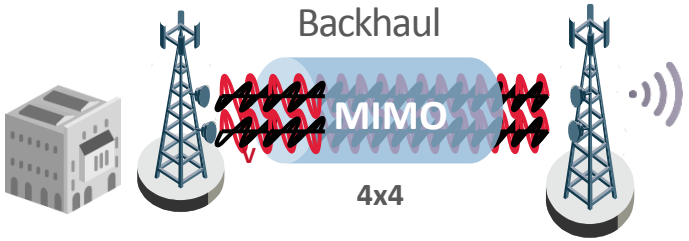
## Different approaches for brownfield and greenfield environment

*Bandwidth requirement* | *CAPEX & OPEX* | *Long-term perspective* | *Access network technologies & Existing OSP infrastructure*

| Classification | Geo Type | Implementation strategy |
|---|---|---|
| **Brownfield** | All area | • Maximize the usage of **existing copper infrastructure** |
| **Greenfield** | City | • Deploy **fiber infrastructure** |
| | Rural | • Use **wireless technology** (i.e. LTE, Wi-Fi or Microwave) |

# 1. Coverage Expansion: Rural Area

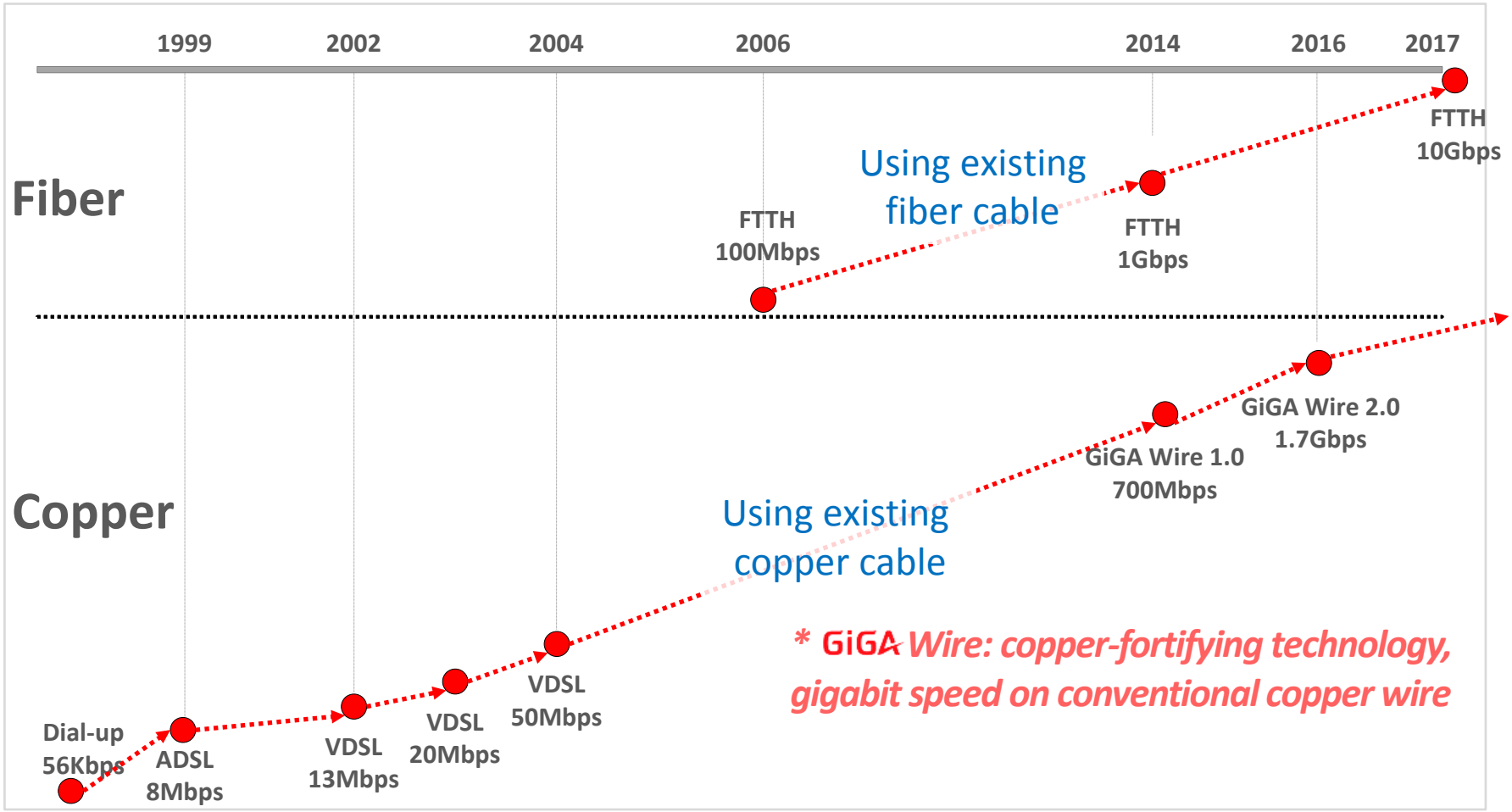
## Wireless technologies such as microwave, Wi-Fi or LTE can be considered

| | | |
|---|---|---|
| Microwave |  | ✓ Max. 89km / 1Gbps backhaul<br>✓ Line of Site |
| Wi-Fi |  | ✓ Max. 20km / 334Mbps backhaul<br>✓ Line of Site |
| LTE |  | ✓ LTE-A (3DL CA)<br>- DL 300Mbps<br>- 75Mbps |

[Source: KT]

# 2. Bandwidth Evolution: KT case

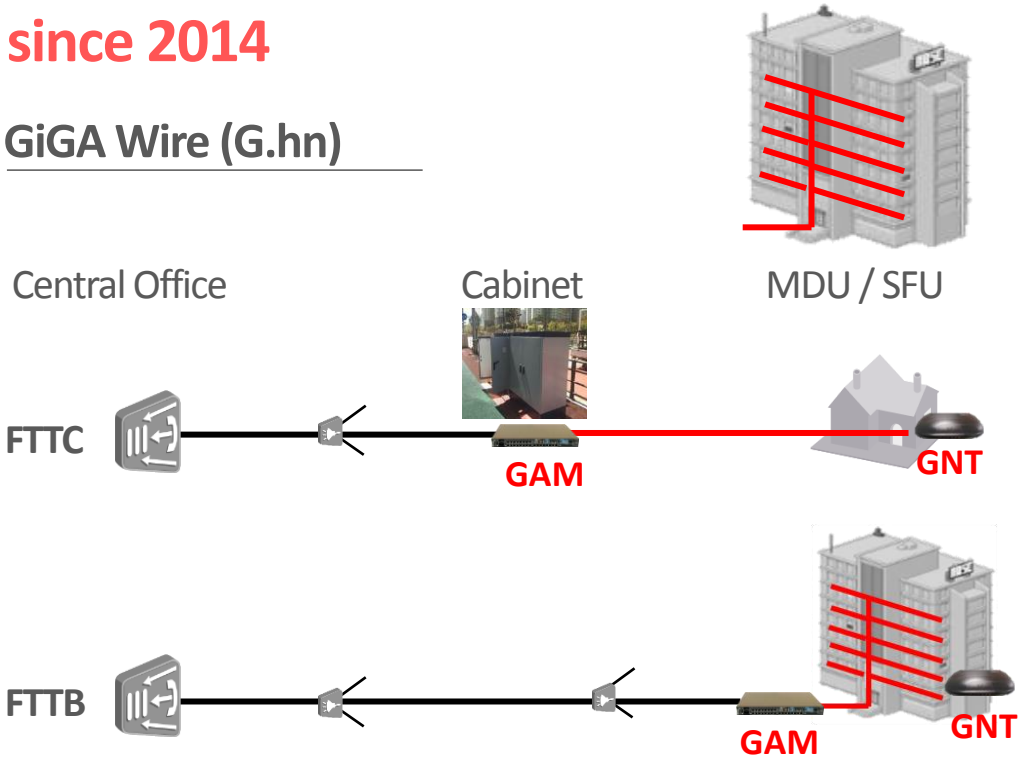
## KT's fixed access network technology has been continuously evolving with strategies of bandwidth expansion and CAPEX/OPEX minimization



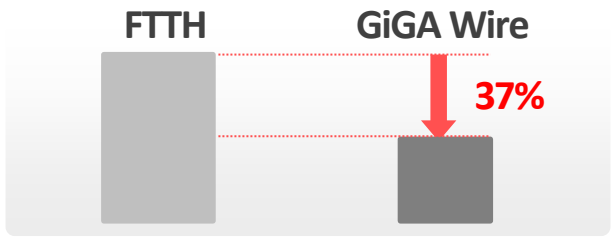
# 2. Bandwidth Evolution: GiGA Wire

## KT GiGA Wire service using the last mile copper has been commercialized since 2014

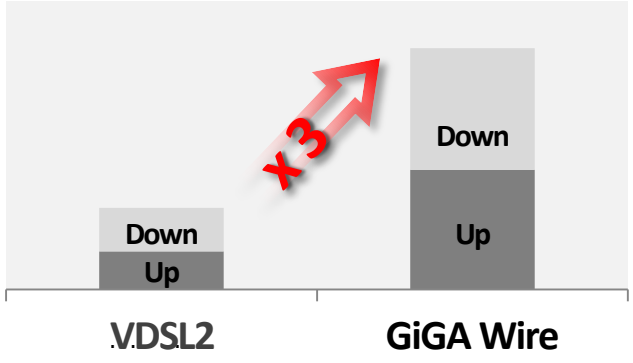
### GiGA Wire (G.hn)




### Cost Saving




**Cost effective**
(37% CAPEX saving per line)




**Enhanced bandwidth**
(3 times faster than VDSL2)

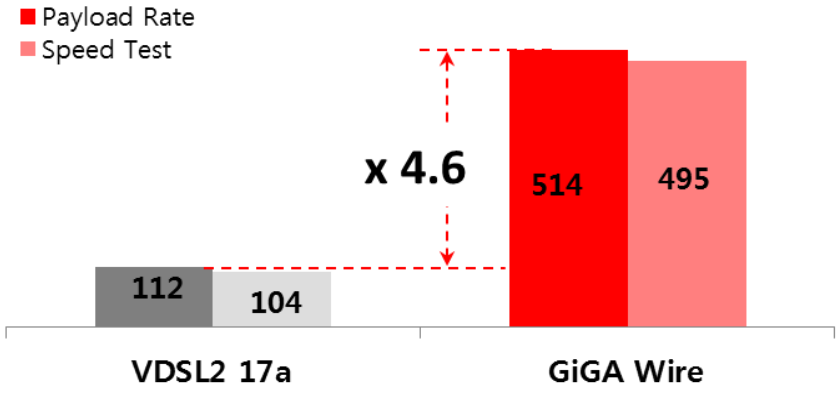
# 2. Bandwidth Evolution: GiGA Wire Case Study

## Globally field proven solution by various environment

- ***Korea*** (FTTB, FTTC)

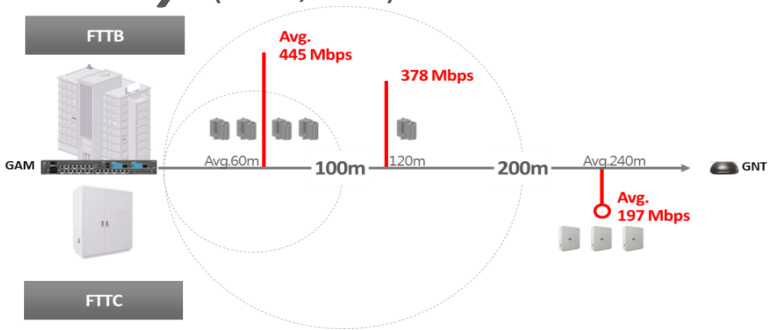
***Avg. 471Mbps (Download)***

- ***The Philippines*** (FTTB, FTTC)



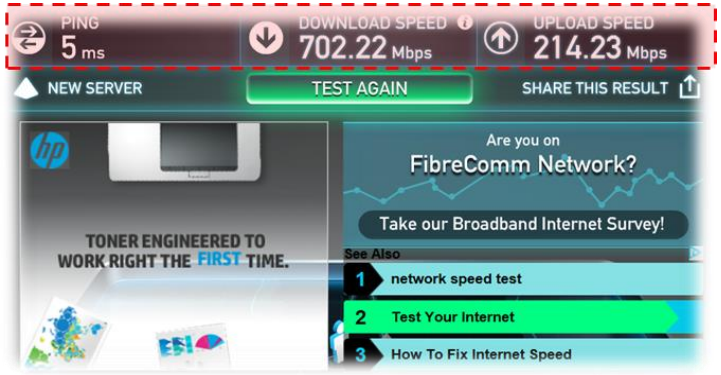

***Avg. 514 Mbps*(x *4.6* vs. VDSL2)**

- ***Turkey*** (FTTB,FTTC)




***Avg. 445 Mbps*(x *8.8* vs. VDSL)**

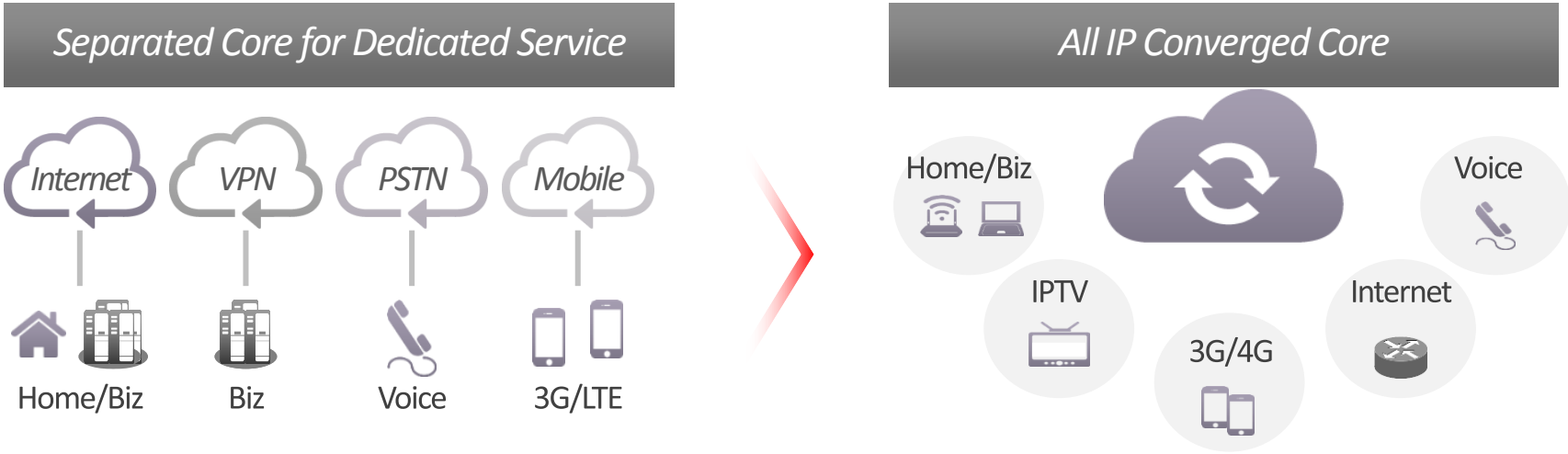
- ***Malaysia*** (FTTB)



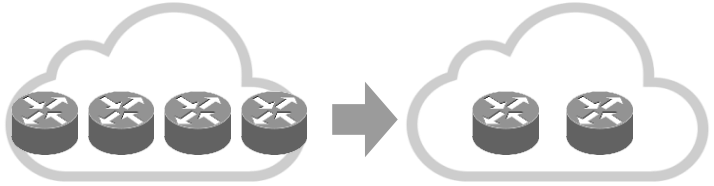

***Max. 700Mbps***

# 3. Network Convergence

## Integrate silo network for each service into common core network




- *Cost saving*
- *Fast lead time*



- *Integrated management*

*Simple*
*Smart*
*Strong*

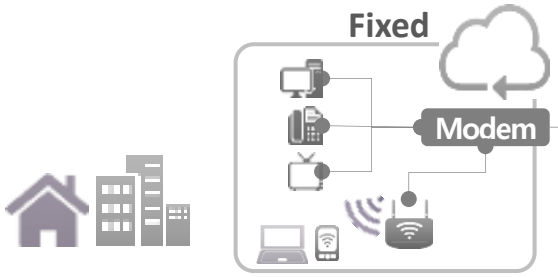
*Productivity*

*OPEX*

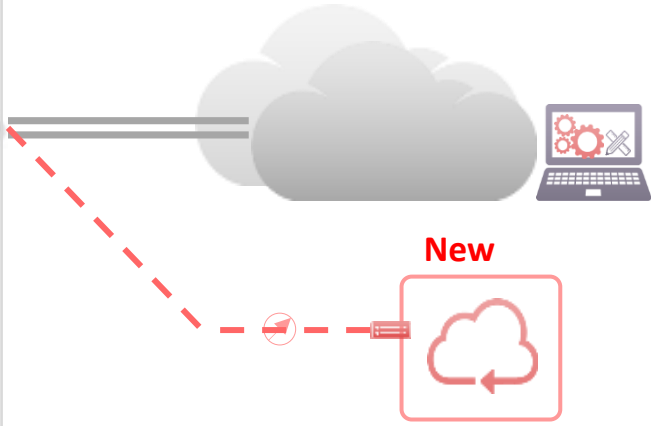
# Operation efficiency: Intelligent Management for Access Network

**Quality Control** — All-In Home, OFTS

**Fast Deployment** — TOMS & TOPS




• Home network monitoring solution with remote control function




• Intelligent engineering tool for automatic FOC/OSP design and management

• A centralized system for real-time FOC failure and localization detection