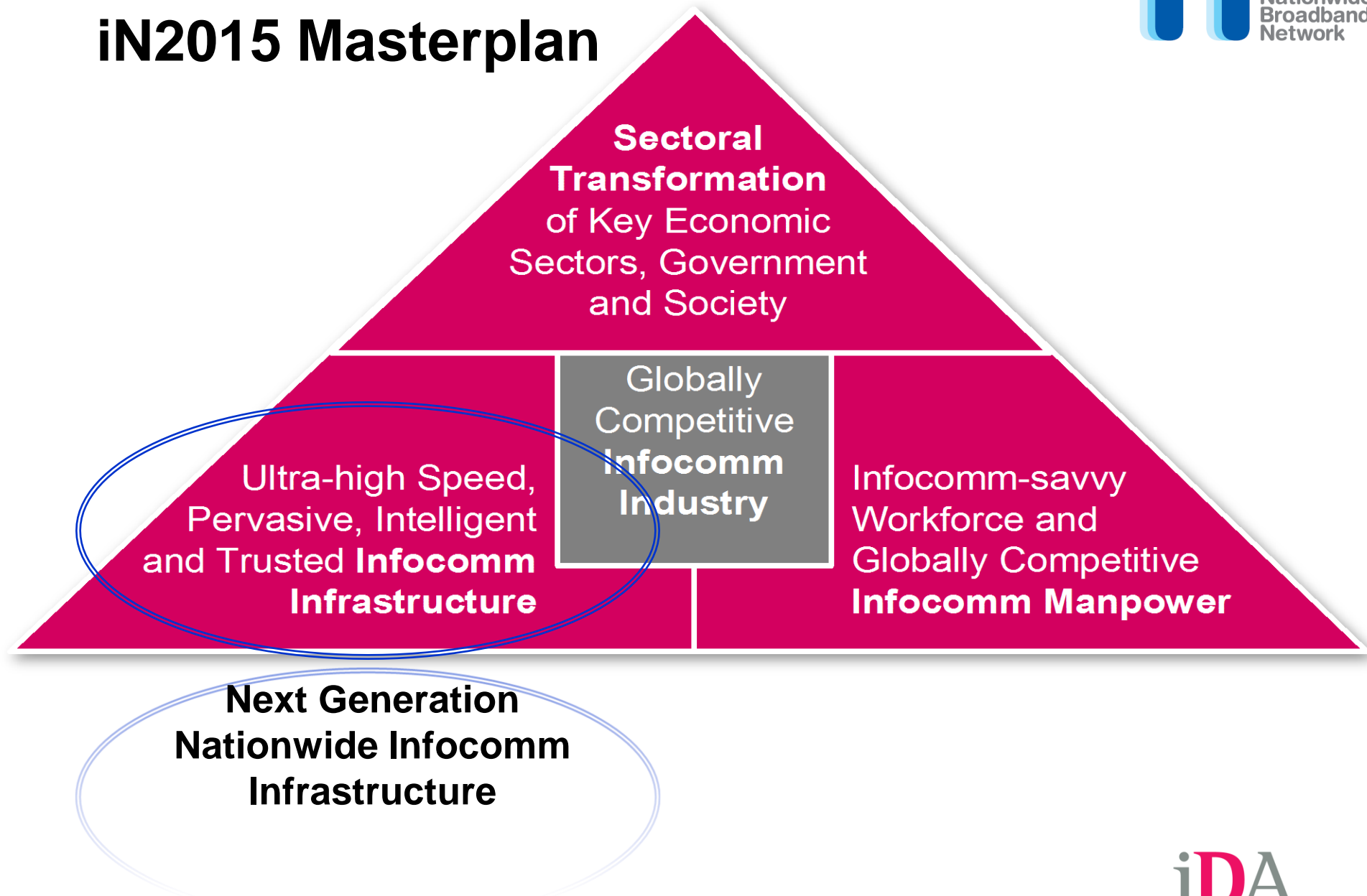


Next Generation National Broadband Network (Next Gen NBN)

By Mr Khoong Hock Yun,
Assistant CEO, Infrastructure and Services Development Group,
IDA

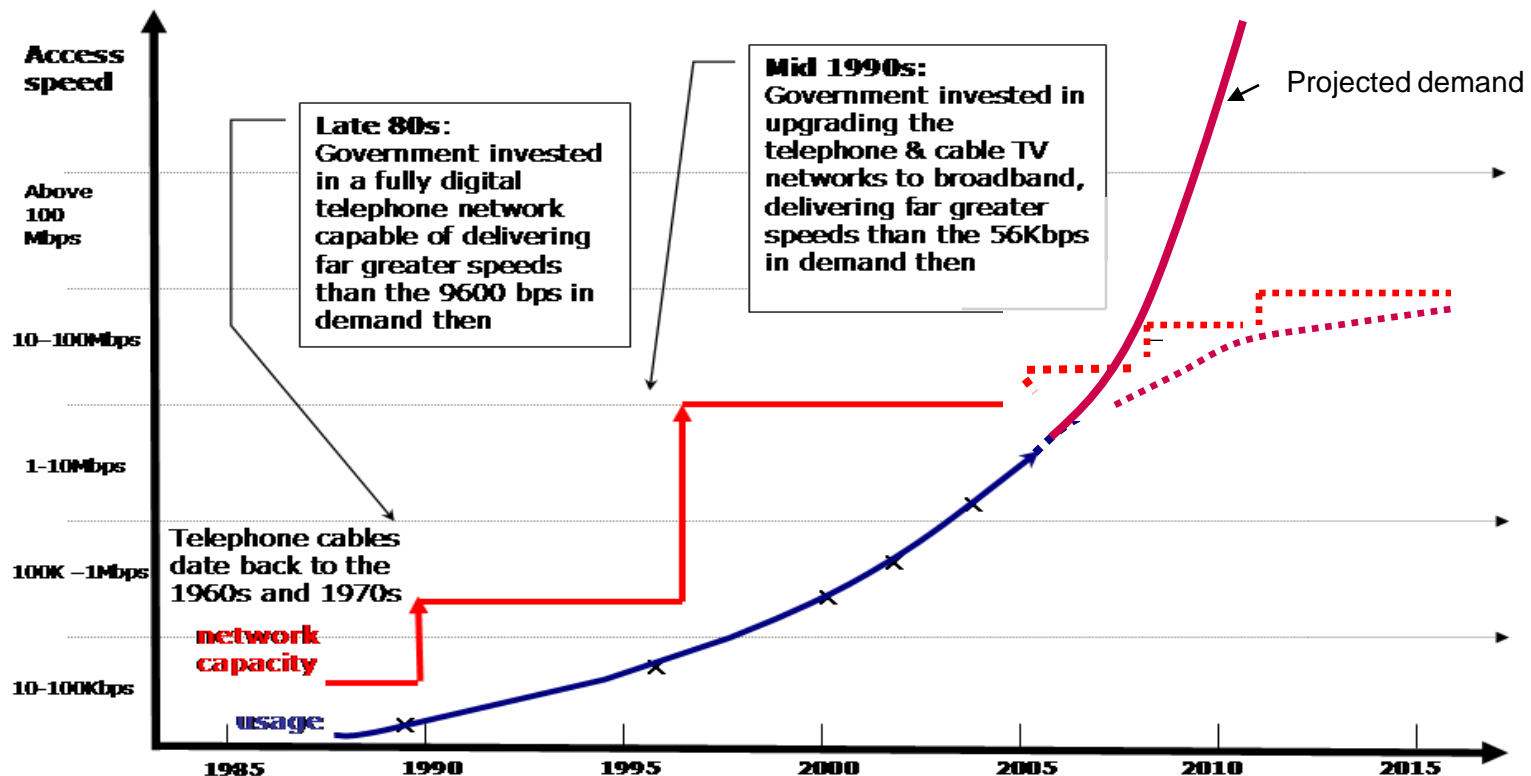
16 February 2012

iN2015 Masterplan



Infrastructure leadership has been critical to Singapore's competitiveness

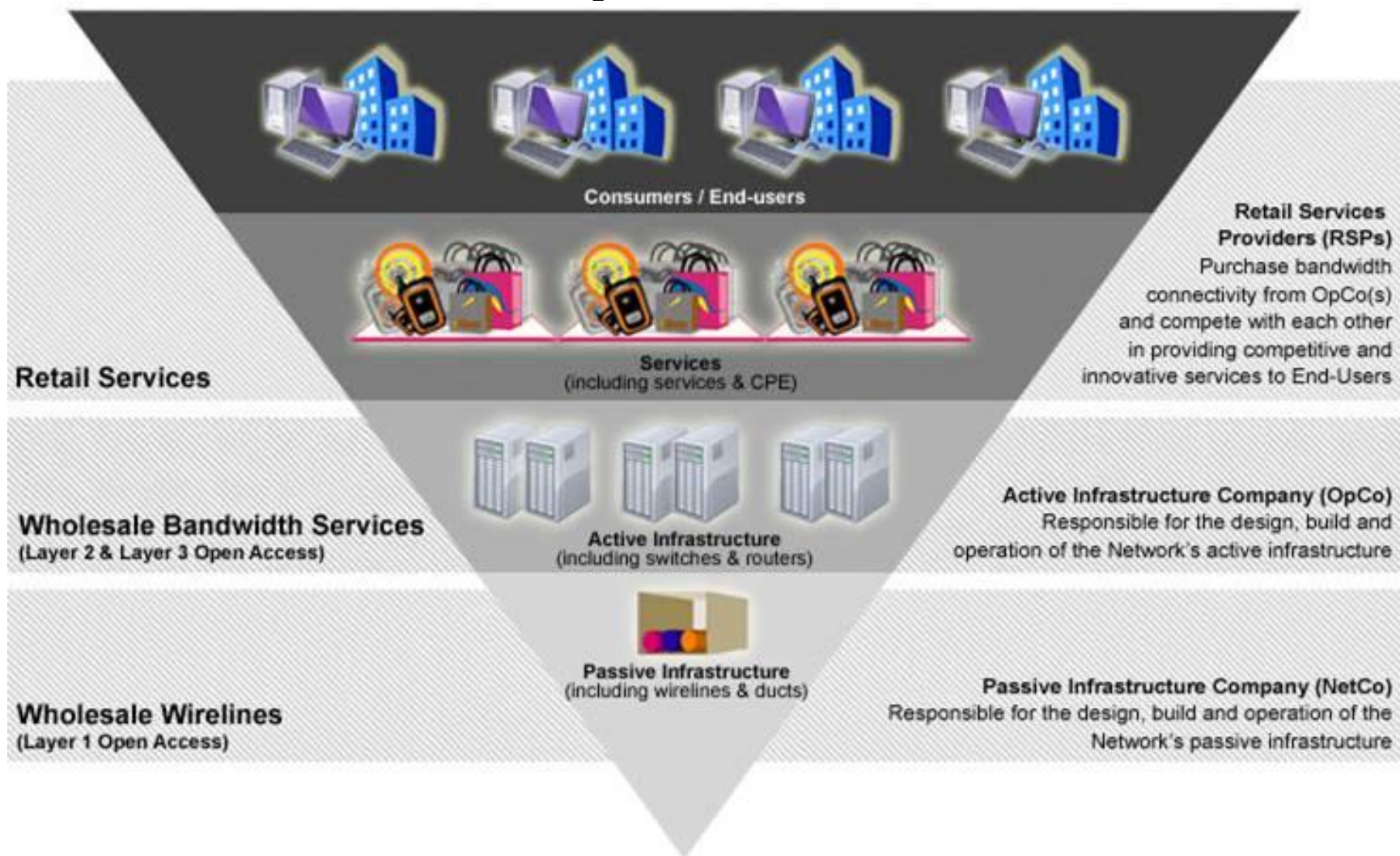
- As a source of competitive advantage, broadband is an infrastructure and not a luxury
- Singapore's economic growth has never been constrained by infrastructure bottlenecks (e.g. Changi Airport, Pasir Panjang Terminal)



Desired Outcomes of the Next Gen NBN Project

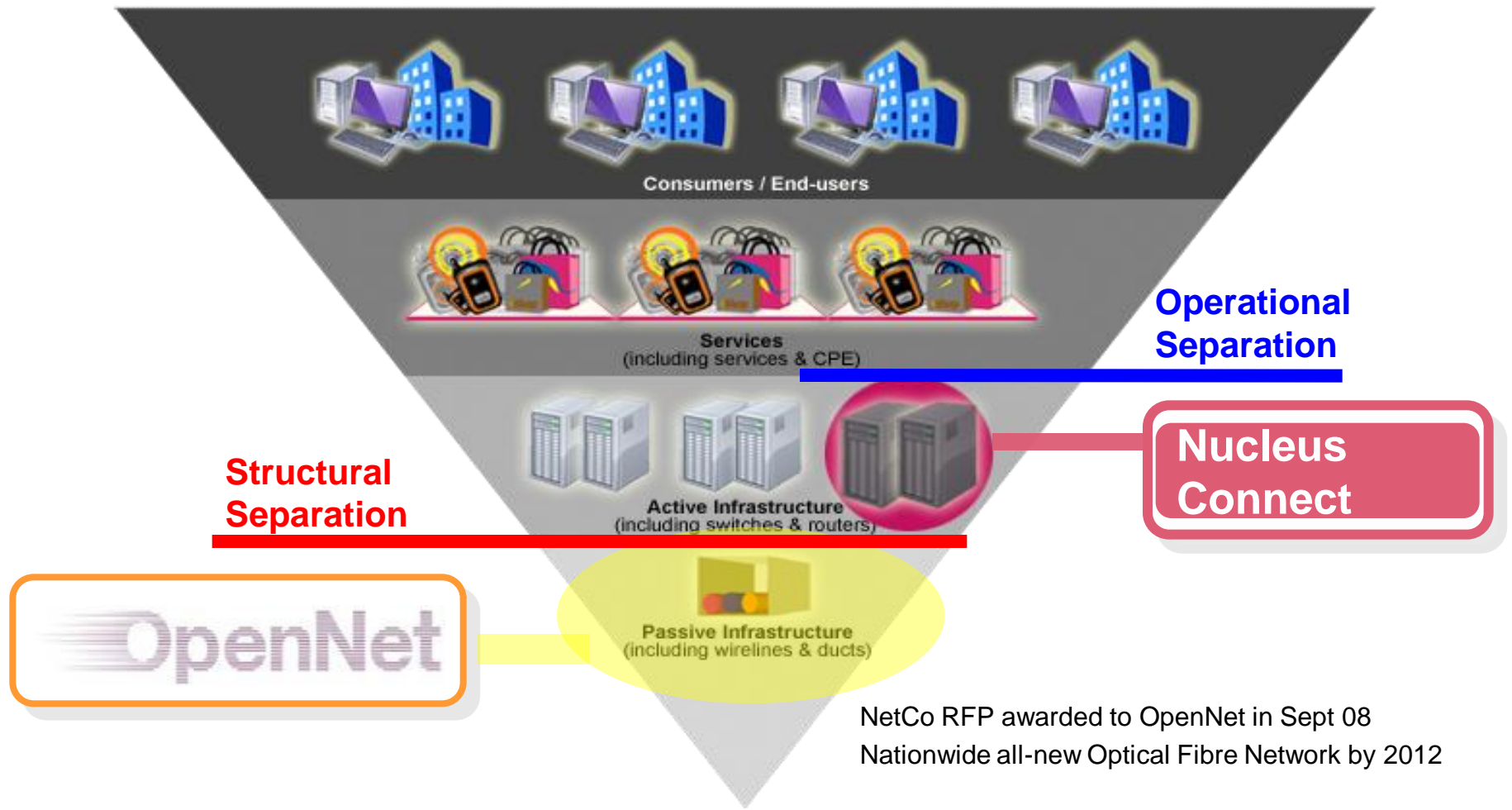


Next Gen NBN Industry Structure



Overview of Next Gen NBN Project

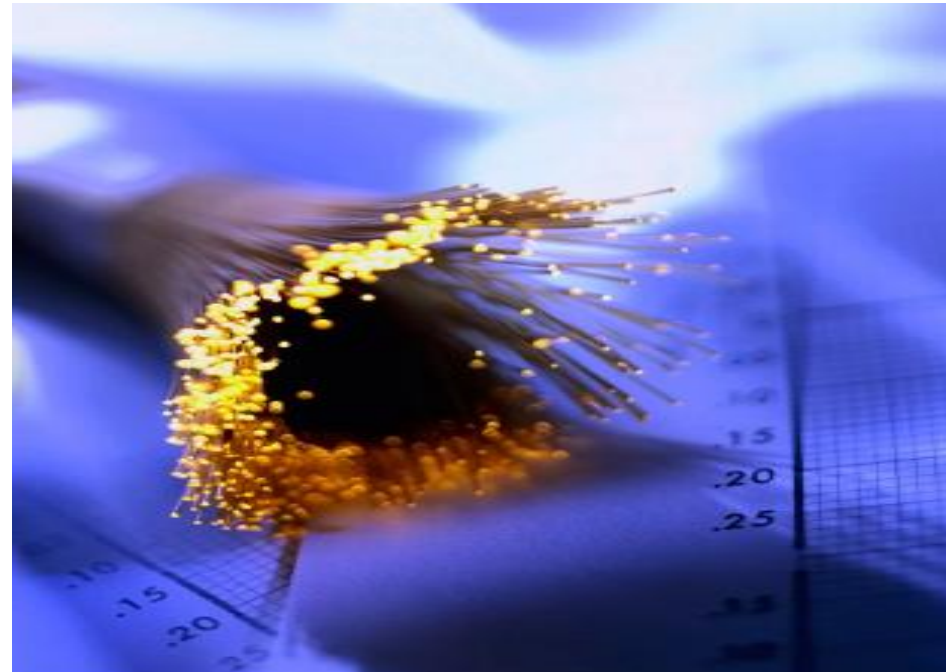
Award of Next Gen NBN Project



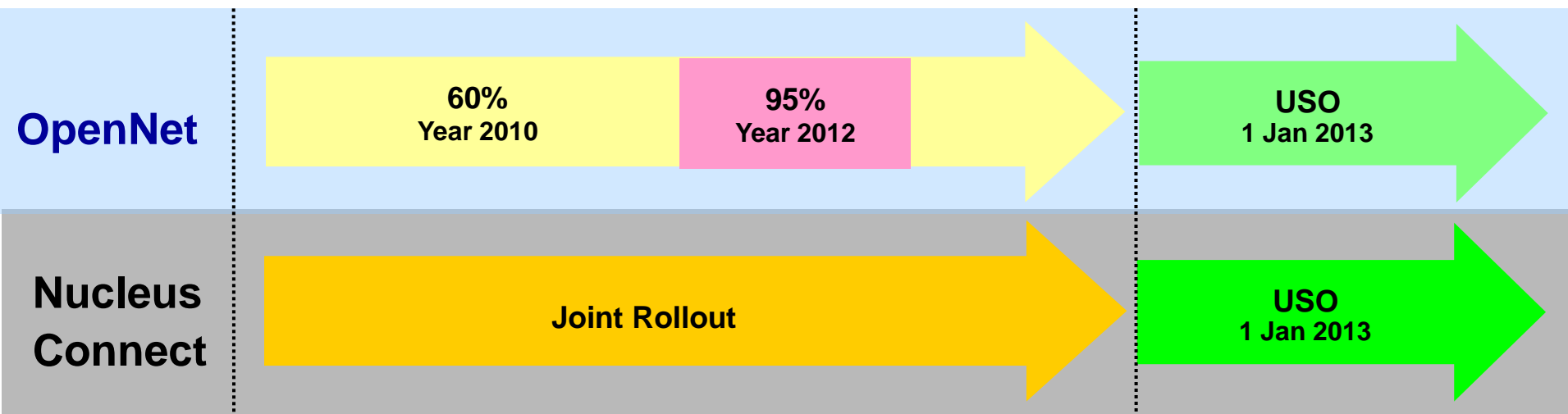
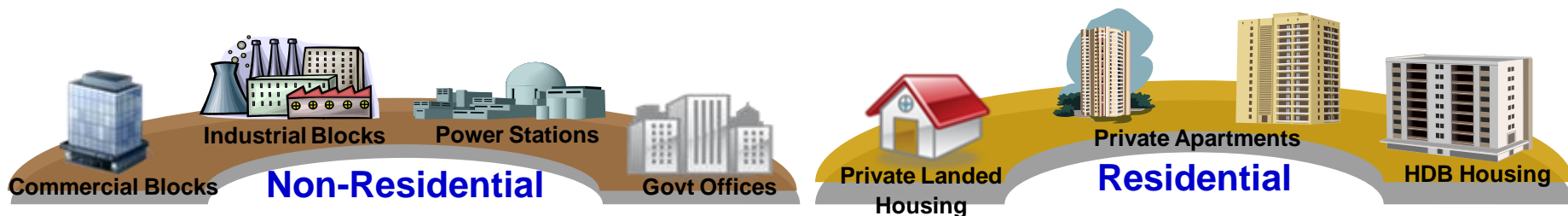
Nation-wide Optical Fibre Network



- New, all-fibre network to the homes and businesses
- Future-proof, capable of supporting more than 1 Gbps
- Leverage existing underlying passive infrastructure assets, such as ducts, manholes and exchanges



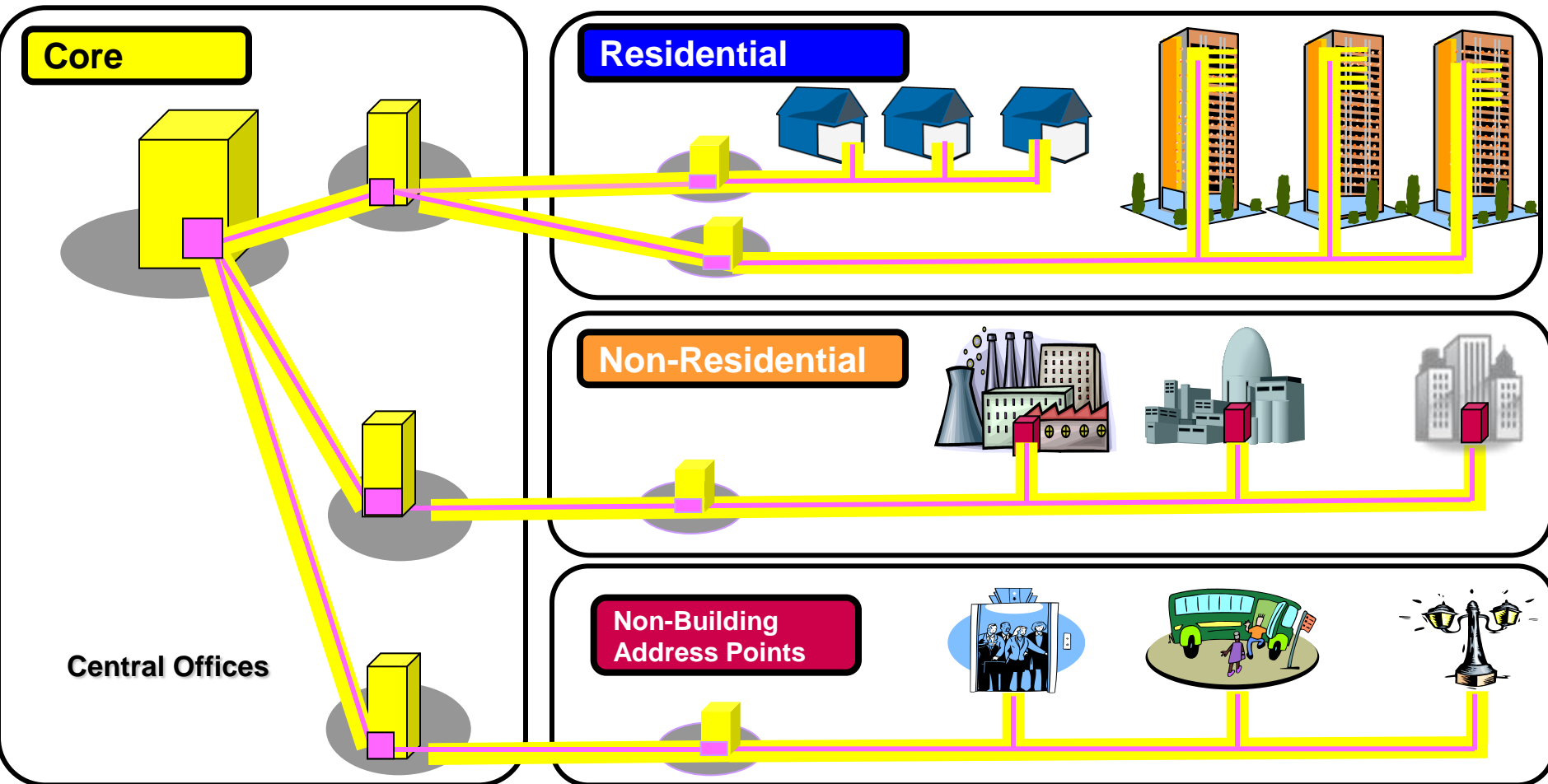
Next Gen NBN Deployment Timeframe



- Nucleus Connect's services made available soon after OpenNet has declared coverage of a building
- Universal Service Obligation (USO) from 1 Jan 2013

Overview of Next Gen NBN Project

Optical Fibre Deployment by OpenNet

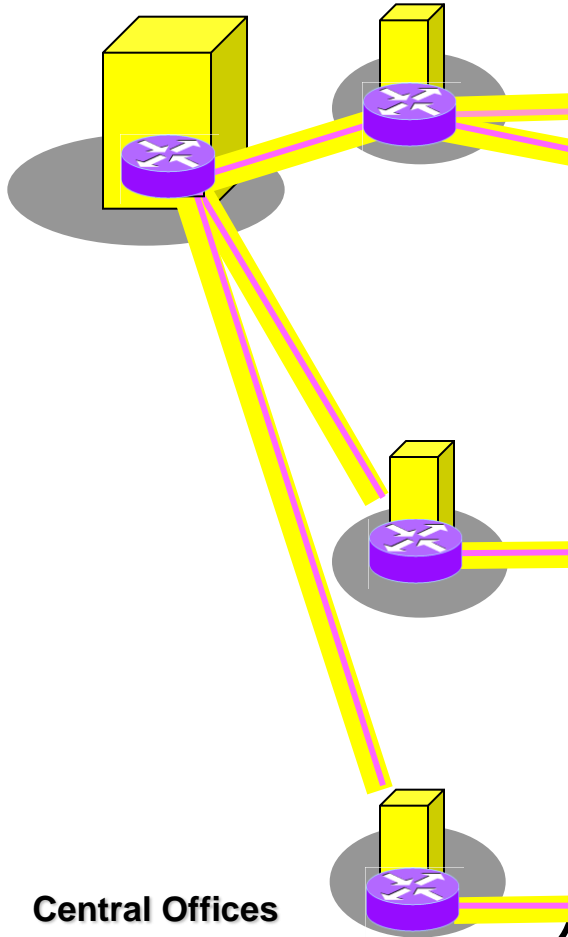


Overview of Next Gen NBN Project

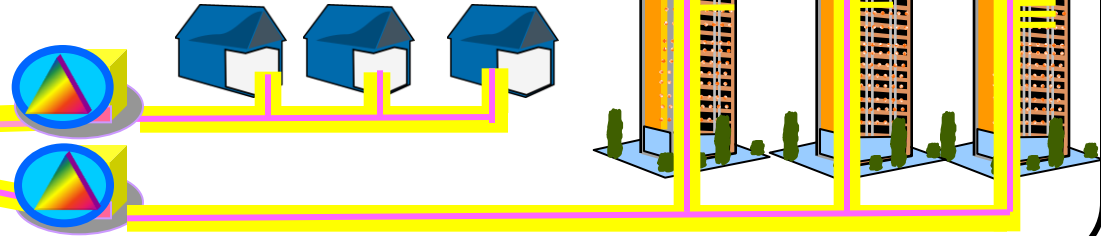
Equipment Deployed by Nucleus Connect



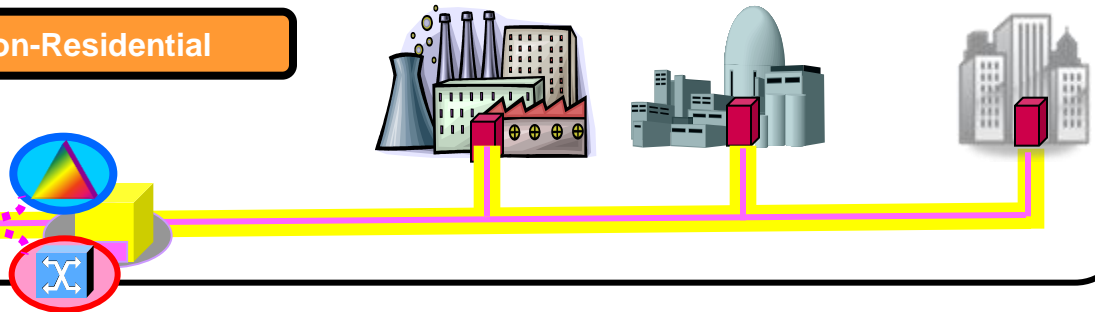
Core



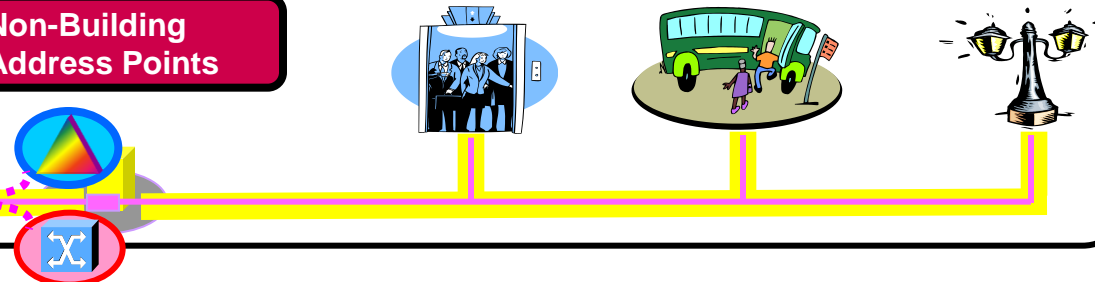
Residential



Non-Residential



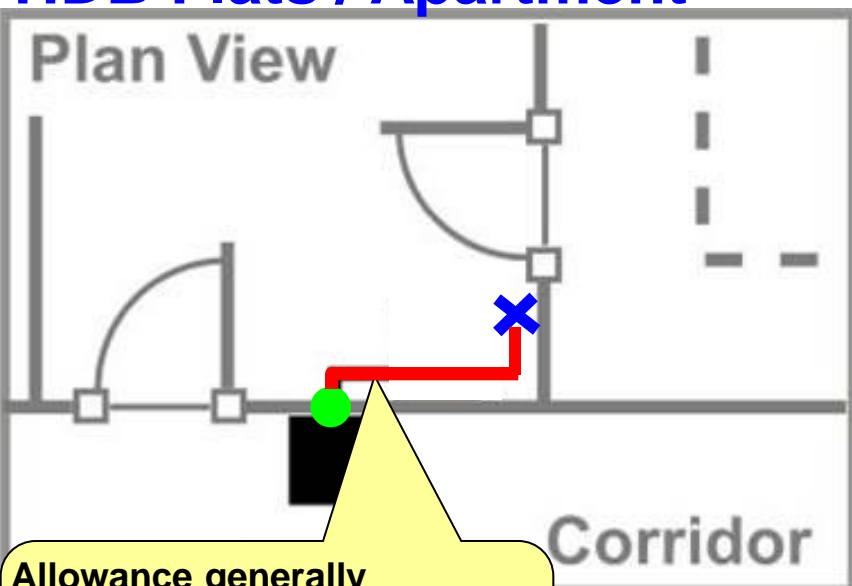
Non-Building Address Points



Central Offices

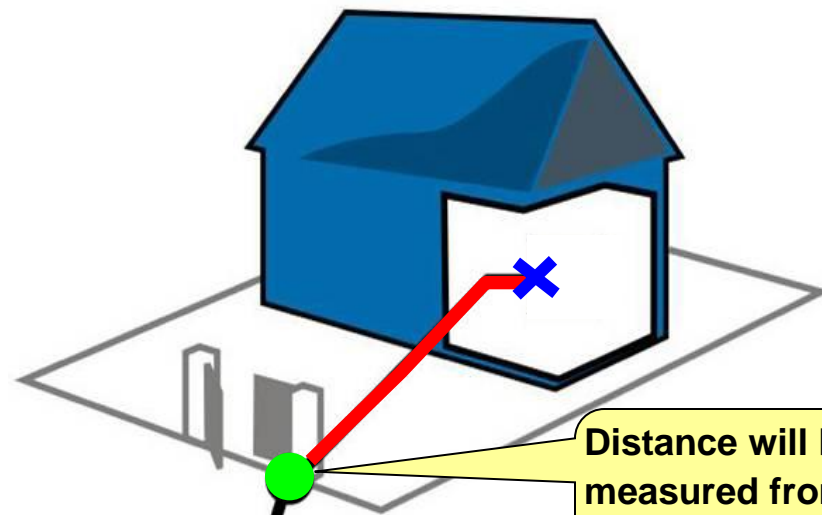
First Termination Point to Residential Premises

HDB Flats / Apartment



Allowance generally sufficient to install a termination point at a convenient location in living room

Landed Property

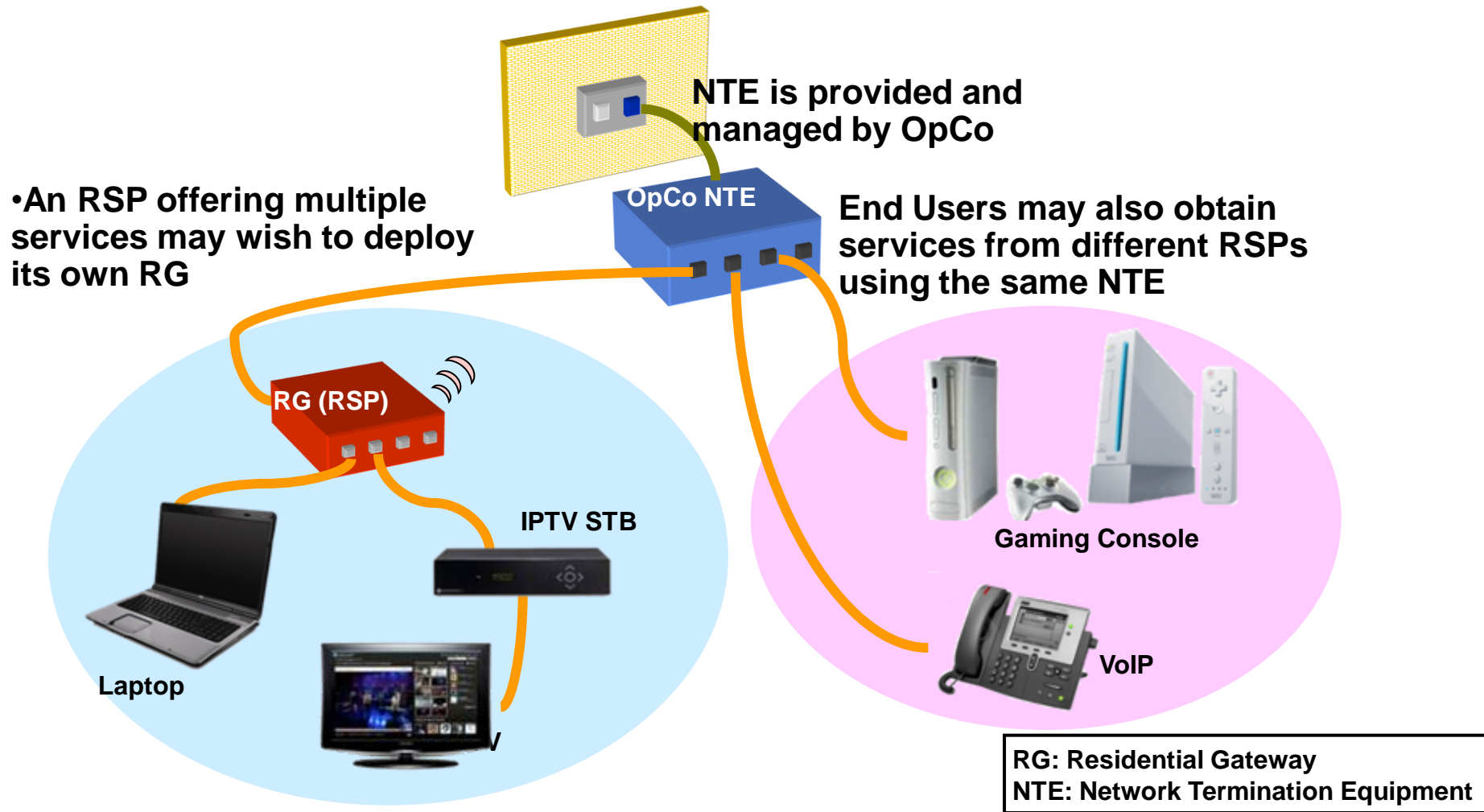


Distance will be measured from the gatepost of the home

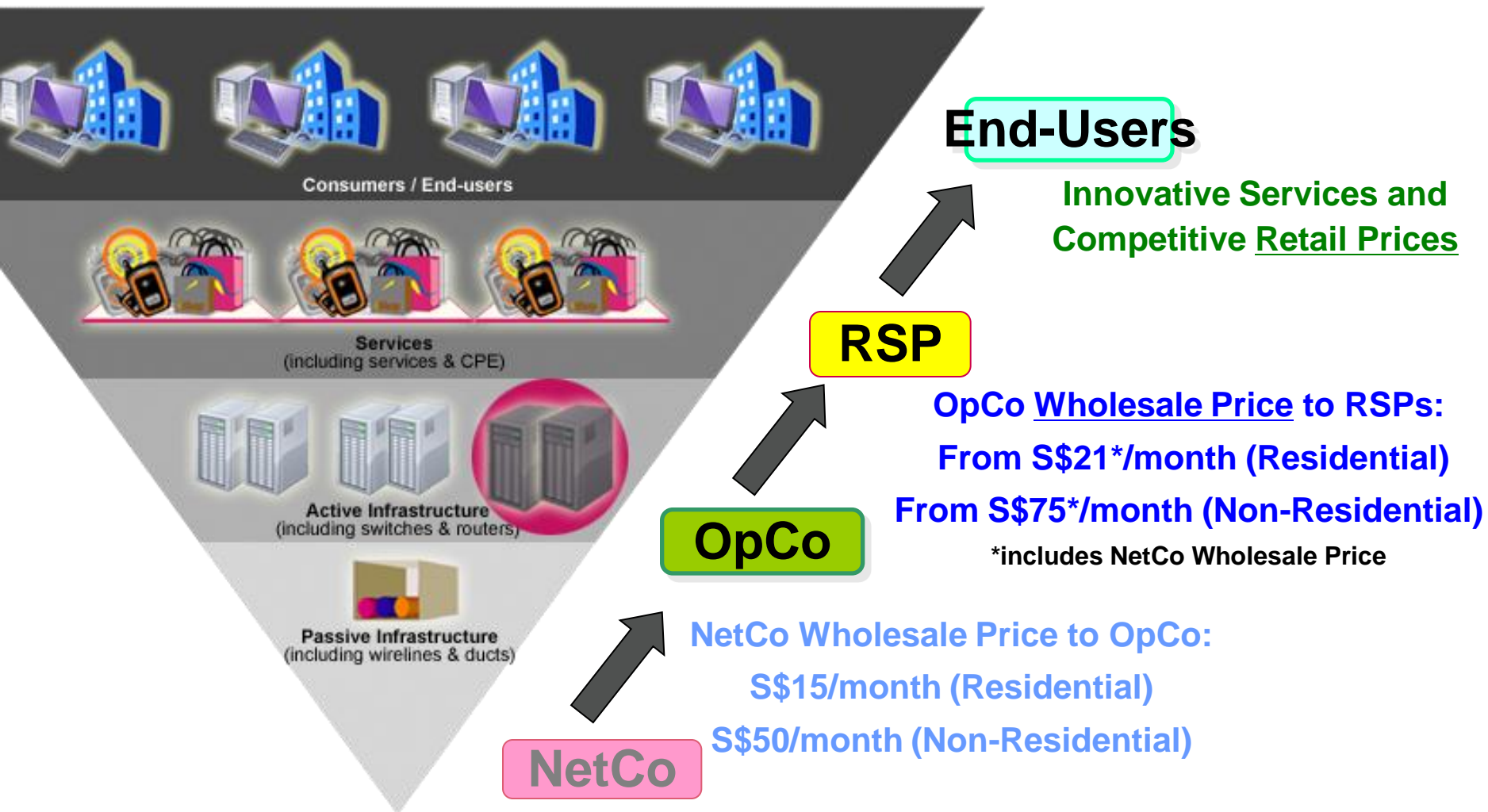
- Point of entry
- ≤ 15 metres
- ✕ First termination point

- Each home/building owner will enjoy waiver of installation charges for the 1st termination point when the network first reaches his/her premise
 - Fibre installation (surface ducting) charges to 1st termination point will be waived for initial 15m (cost-oriented charges thereafter)

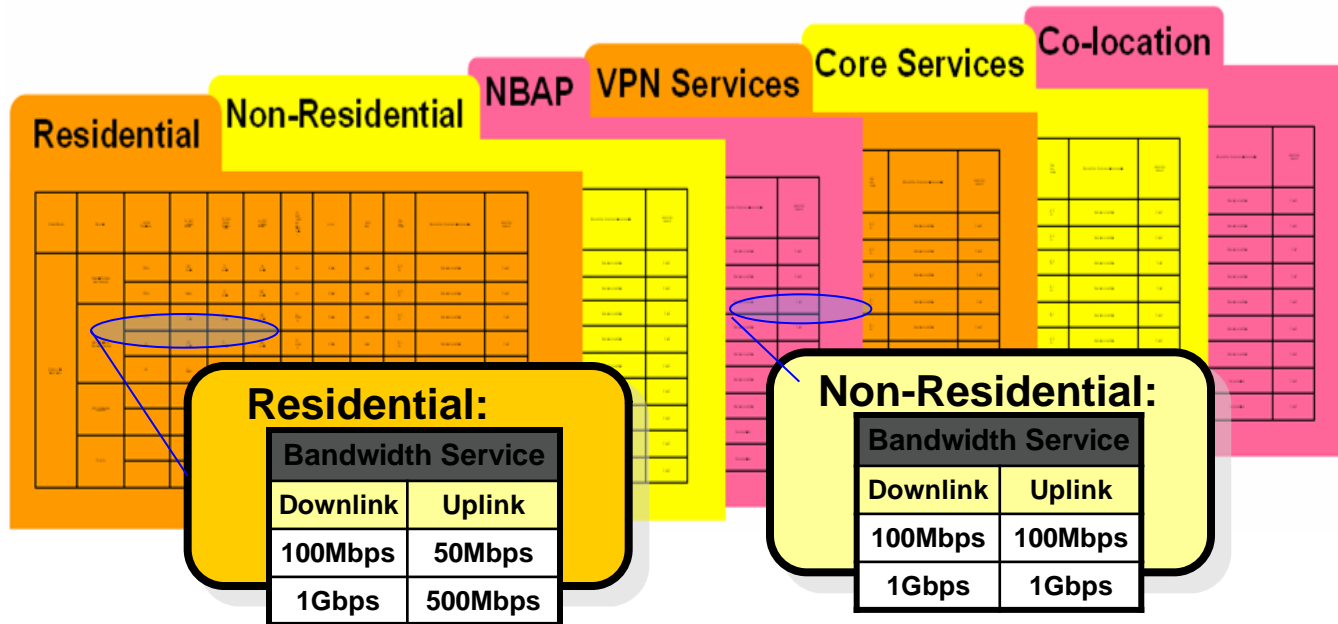
Provision of Services in Homes



Overview of Next Gen NBN Wholesale Prices



Wholesale Service Offerings



Modular

- > Unbundled services
- > Able to add-on bandwidth increments and different classes of service

Flexible

- > OpCo provides online platform for self-provisioning by RSPs

Comprehensive

- > 1 Gbps available
- > Facilitates RSPs having fast and easy market entry

Class D
Best Effort

Examples of
Services:
Internet surfing,
VoIP

Class C
Mission Critical

Examples of
Services:
ATMs,
Data Centres,
Control Systems

Class B
Near Real Time

Examples of
Services:
IPTV
Video Streaming,
Gaming, Video
Conferencing

Class A
Real Time

Examples of
Services:
Video Conferencing,
Premium VoIP
Gaming

Flexibility of service
offerings allowing RSPs to
meet the needs of diverse
range of applications &
services



Permanent showcase on benefits and possibilities of Next Gen NBN and services



Most Fibred-Up Constituency Contest

- Contest objectives
 1. Encourage home owners to sign-up for the free installation
 2. Involve grassroots to reach out and educate home owners
- First Prize Winners
 - 24 Nov 2010 – Chua Chu Kang Constituency
 - 25 Jun 2011 – Yew Tee Constituency
 - 4 Feb 2012 – Bishan North Constituency




Operational challenges exist

❖ OpenNet facing operational challenges:

- ◆ Internal building management approvals to grant OpenNet access and use of telecoms facilities
- ◆ Imposition of charges by building management on OpenNet for access
- ◆ Ramping up capability to cope with increased demand
- ◆ Appeals from homeowners who have missed first pass

❖ OpenNet is making efforts

- ◆ Increasing resources to engage building management
- ◆ Additional service slots to meet greater demand
- ◆ Acceding to about 9 in 10 appeals for homeowners

 **Approve:** Homeowners who were away & can show proof (e.g. holiday/hospitalisation)

 **Rejected:** Claims not to have received OpenNet letter or where previous homeowners rejected OpenNet's offer



Optical fibre
Installation
in progress



Optical fibre socket
(terminal point)
installed

IDA is taking action to remedy situation

- ❖ Direct building owners/developers to comply with building code/ requirements
- ❖ Review OpenNet's interconnection offer (ICO) based on industry consultation in Nov-Dec 2011. Target for review results to be ready by 2Q 2012

IDA reviewing OpenNet services

Complaints about poor service, long wait prompt action

By GRACE CHEN
SENIOR CORRESPONDENT

A SPATE of complaints over poor service has prompted the Government to review the operations of OpenNet, the company set up to install the super-fast national fibre broadband network.

The aim is to iron out kinks that have disrupted the network's smooth roll-out. These include long waits for fibre installation at some homes and offices and poor customer service. Other problems include classifying a black-and-white bungalow as an office rather than a home.

This is the first review of OpenNet's so-called interconnection offer (ICO) initiated by the Information Development Authority of Singapore (IDA). The ICO is a contract that sets out the company's responsibilities and tasks as well as the roll-out schedule and plan for fibre installation.

OpenNet started commercial operations in April last year. IDA began its review last month and is seeking industry and public feedback until Dec 31.

The fibre network is part of the Next Generation National Broadband Network, OpenNet, a consortium of Asia NetworkMedia, SingTel, SP Telecommunications and Singapore Press Holdings, won awarded a \$750 million contract in September 2009 to lay the fibre infrastructure to all homes and offices by the end of 2011 year.

In the consultation document drawn up for the review, both IDA and OpenNet have submitted proposed changes to the way OpenNet operates and manages its relationship with its business

partners such as the service providers. IDA's 18 proposed amendments include getting OpenNet to investigate and report on why some fibre connections have no signals and cannot be turned on.

The proposed ICO changes include:

- Offering express fibre connection to homes and offices within a day instead of three working days for homes and seven working days for offices;

- Providing a process to allow service providers to change appointment times for home fibre installations; and

- Improving the accuracy of classifying buildings as residential or for home use.

OpenNet's 17 proposed changes include provisions to clarify the repair of fibres damaged by the user, a better method of classifying buildings and a process to hand over completed fibre installation projects to service providers.

The kinks have not slowed down OpenNet's overall schedule of fibre installation across Singapore.

But they have caused much frustration among people such as home owners waiting to hook up to the fibre network, and companies such as StarHub, M1 and SuperInternet whose efforts to sign on as many new fibre customers as possible have been thwarted.

According to IDA, OpenNet is on track to lay the fibre network to 80 per cent of homes and offices by this month and up to 95 per cent by June next year.

IDA assistant chief executive Khoo Hock Yee described the hiccups as "teething problems". "We told ourselves when we start-

ed four years ago that we'll just start and then resolve the problems as they crop up," he said.

For OpenNet, one key lesson is that it was not sufficient to follow an installation schedule. Regular communication with potential customers, service providers and other relevant parties was needed for a smoother ride, he added, saying that the company had begun to do this.

OpenNet chief executive Khoo Chin Hean said: "For example, if the service providers had told us about the subscription drive, we would not have been caught off guard by the increased demand mid-this year, which we found difficult to fulfil because trained staff for fibre installation were hard to find."

Mr Khoo's advice to all parties: "Everyone should try to treat each other. They should learn to share information, then the system would work more smoothly."

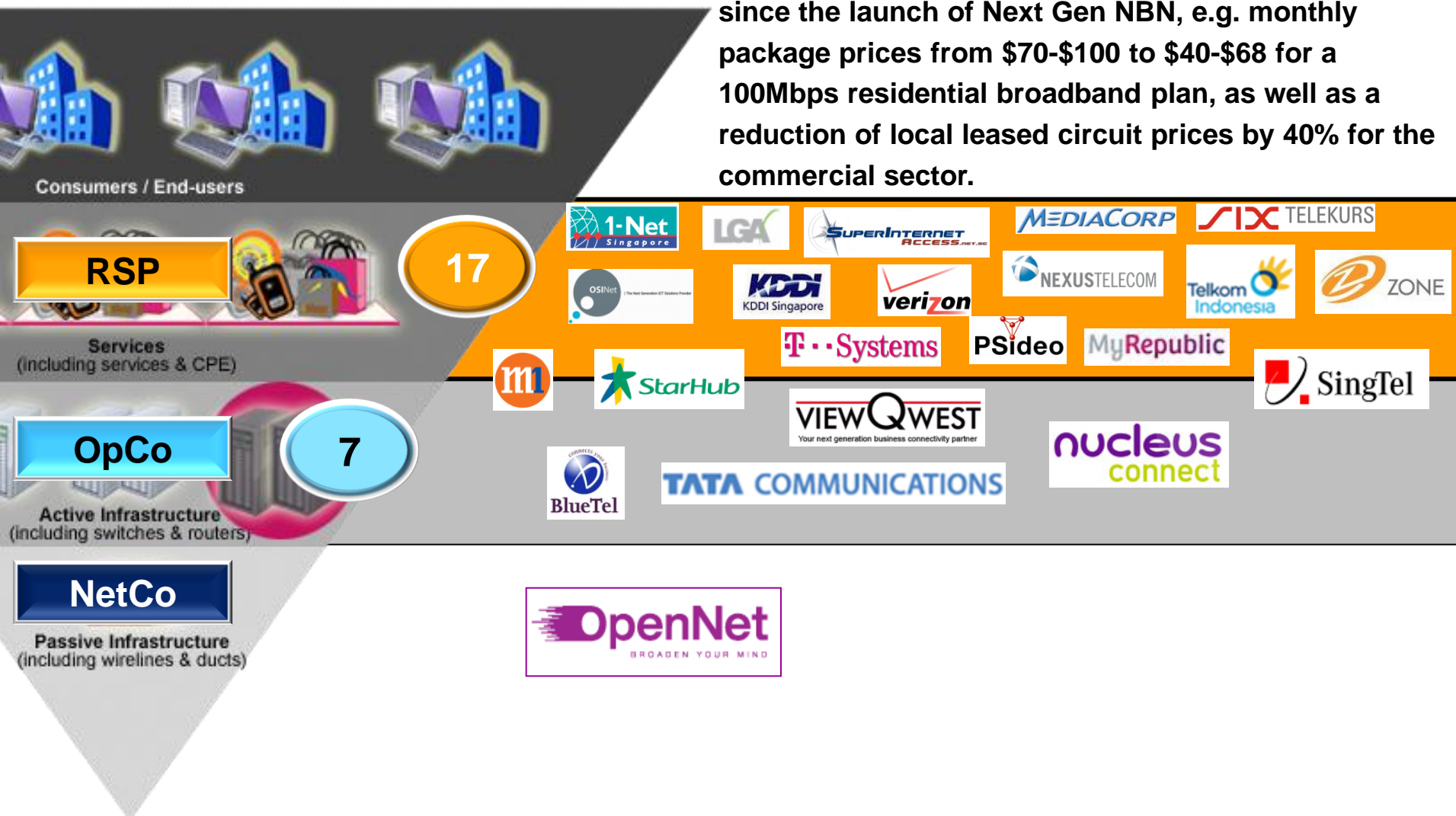
In July, IDA also reviewed, for the first time, the IT system capability of another company, Nixtus Connect, whose task is to turn the fibre on once it is installed.

The system is linked to OpenNet's database and carries the status of homes and buildings wired up with the fibre. Service providers access it to find out which homes and offices are ready for fibre offerings. An IDA spokesman said a similar operational review of Nixtus Connect's ICO is possible "especially if any changes to the OpenNet ICO have a consequential impact on Nixtus Connect's service offerings".

infoc@singtel.com.sg

Current Next Gen NBN Landscape

Prices for broadband connections have dropped since the launch of Next Gen NBN, e.g. monthly package prices from \$70-\$100 to \$40-\$68 for a 100Mbps residential broadband plan, as well as a reduction of local leased circuit prices by 40% for the commercial sector.



Commercially Available Next Gen Services

Cloud Based Services for Businesses



The LGA Private Cloud - VPN Intranet is designed for business communication needs



LockCube is a secure online storage solution that gives enterprises a fast, smart and secure way to backup, restore and access their data anytime and anywhere, by using any devices



ScaleNow cloud computing services provide Platform-as-a-Service (PaaS), enabling companies a feasible way to adopt SaaS model of delivering software applications to their customers or end-users



StarHub e-HR Management is a comprehensive HRM system which can streamline and integrate HRM processes, and enables HR Managers to control and manage their HR activities anytime, anywhere via a friendly online interface

Entertainment for Consumers



SingTel Cloud Gaming Service is a cutting-edge video-game-on-demand platform that delivers an exciting library of games to PCs instantly over an Internet connection



exCite TV provides a unique interactive television viewing experience, include video search engine and TV APPs store. Gesture-based remote controller



Internet, movies, celebrity concerts, exciting games and fun learning modules will be available via high-speed broadband from this multimedia device



LittleLives' new innovative LittleStore service helps students learn English, Chinese, Math, Science, Art and more, through engaging animation shown in high definition videos.



Prevview, Asia's first interactive video job portal, aims to help Jobseekers and Employers brand themselves better with the power of Video Resumes on a professional social media platform.

Impact of Next Gen NBN on SingTel Non-Residential Offerings

SingTel's LLC	Wholesale MRC as at Jan 2008*	Wholesale MRC as at Jan 2011*
2Mbps	\$1,080-\$1,200	\$1,080-\$1,200
45Mbps	\$5,740-\$6,890	\$4,737-\$5,211 ▼
155Mbps	\$11,440-\$13,000	\$7,343-\$8,077 ▼
622Mbps	\$33,600- 39,000	\$20,000-\$25,500 ▼
SingTel's MetroEthernet	Retail MRC as at Jan 2008	Retail MRC as at Jan 2011
2Mbps	\$1,300	\$1,160 ▼
10Mbps	\$4,300	\$2,300 ▼
50Mbps	\$6,900	\$3,600 ▼
100Mbps	\$10,600	\$6,000 ▼
1Gbps*	\$17,400	\$8,200 ▼
SingTel's Meg@POP IPVPN EthernetLink	Wholesale MRC as at Jan 2008	Wholesale MRC as at Jan 2011
2Mbps	\$750	\$435 ▼
10Mbps	\$2,400	\$435 ▼
50Mbps	\$3,900	\$750 ▼
100Mbps	\$6,000	\$1,050 ▼
1Gbps	\$17,000	\$7,500 ▼

SingTel's LLC prices reduced (up to 40%)

SingTel's MetroE prices reduced (up to 52%)

SingTel's IPVPN prices reduced (up to 82%)

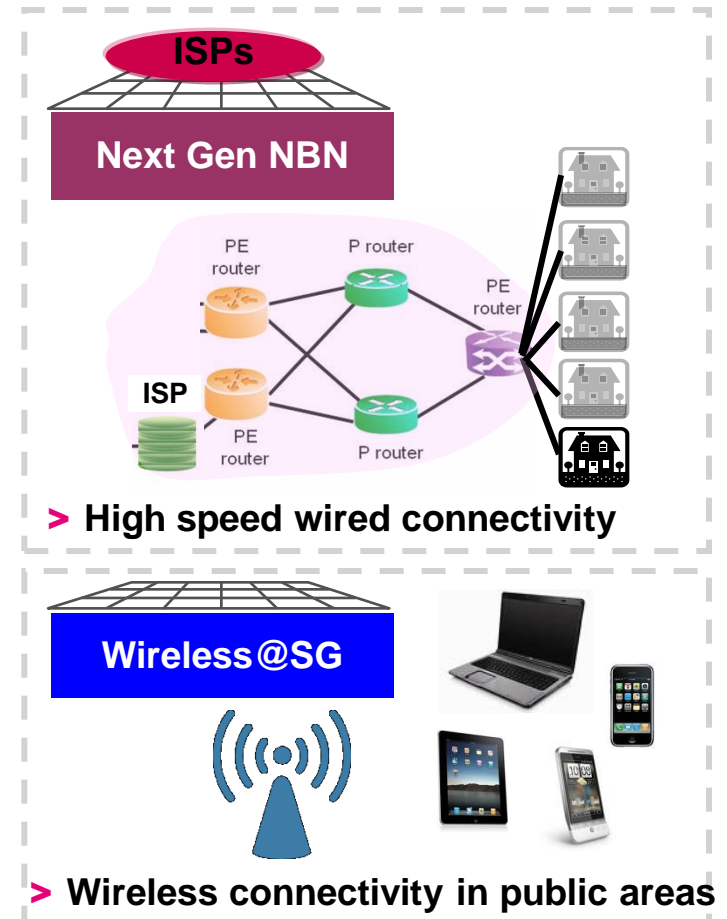
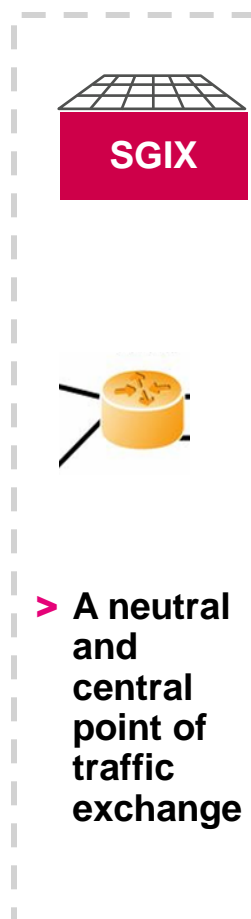
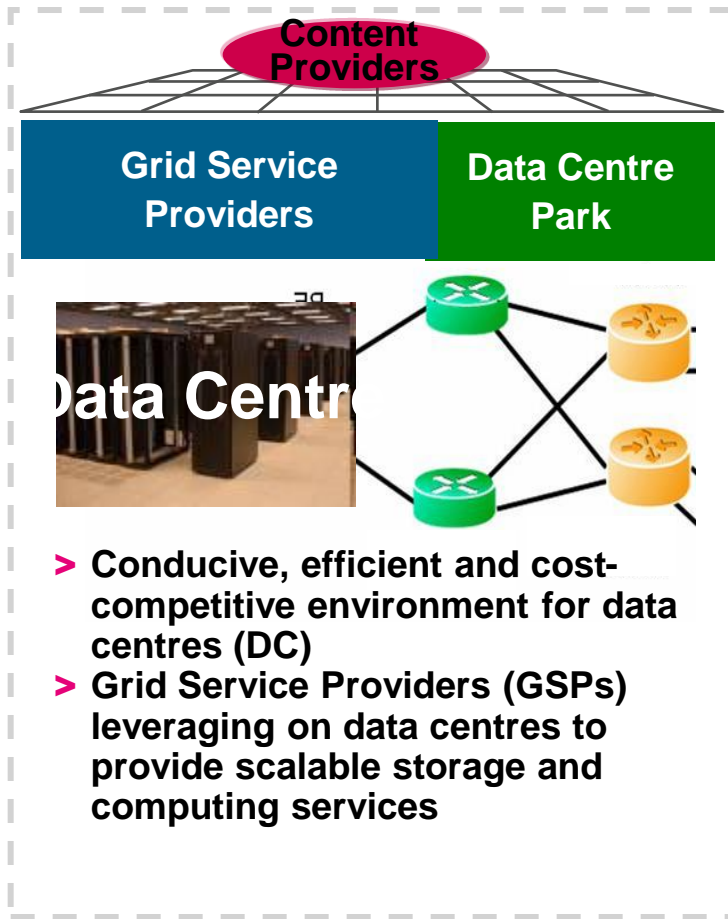
Fibre and Non-Fibre Residential Broadband Prices

Price	Fibre Package Speed in Mbps (Price)	Non-Fibre Package Speed in Mbps (Price)
< \$49	25(\$39)	5(\$25), 8(\$36) 3(\$24), 6(\$34), 16(\$44) 6(\$36), 10(\$44), 15(\$47)
\$50 - 80	100(\$59) 100(\$62) 100(\$69)	30(\$53), 100(\$76) 30(\$56), 100(\$80)
> \$80	200(\$99), 150(\$82), 200(\$102) 150(\$85), 200(\$95)	

Source: Telco's websites, 29 Nov 2011

Fibre broadband plans are generally cheaper than non-fibre plans

Next Gen NII to meet current and future needs



SINGAPORE: AN INTELLIGENT NATION, A GLOBAL CITY POWERED BY INFOCOMM

www.ida.gov.sg

www.infocommsingapore.sg

