T-Systems Singapore
IIC Singapore – TRPC Forum

International and Domestic Broadband Connectivity in Singapore
-Connectivity Cost and Competition-

Singapore, 01. April 2014
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Deutsche Telekom/T-Systems
Deutsche Telekom AG is one of the world’s leading integrated telecommunications companies with over 142 million mobile customers, 31 million fixed-network lines and more than 17 million broadband lines (as of December 31, 2013). The Group provides fixed network, mobile communications, Internet and IPTV products and services for consumers and ICT solutions for business customers and corporate customers. Deutsche Telekom is present in around 50 countries and has approximately 229,000 employees worldwide. The Group generated revenues of EUR 60.1 billion in the 2013 financial year – more than half of it outside Germany.

T-Systems - Drawing on a global infrastructure of data centers and networks, T-Systems operates information and communication technology (ICT) systems for multinational corporations and public sector institutions. T-Systems provides integrated solutions for the networked future of business and society. Some 50,000 employees at T-Systems combine industry expertise and ICT innovations to add significant value to the digitization strategies and core business of customers all over the world. T-Systems generated revenue of around EUR 9.5 billion in the 2013 financial year.
Disclaimer
Disclaimer

The Chatham House rules apply for this IIC Asia Forum session and this presentation.

The content of this presentation should not be considered as an official statement of Deutsche Telekom Group.
Demand
Demand

Growth Drivers
- Number of Internet Users
- Utilization (Video, CDN, etc)
- Cloud Services
- Smart Phones/Devices
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Demand

A Tale of Three Regions

- South Asia
- Oceania
- East Asia

2008-09 2009-10 2010-11 2011-12 2012-13

0% 25% 50% 75% 100% 125% 150% 175%

Annual International Bandwidth Growth
Most Bandwidth Growth is in Southeast Asia
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Demand

Largest Internet Bandwidth Users in Asia, 2013

- China
- Japan
- Singapore
- Taiwan
- India
- Korea, Rep.
International Connectivity
International Connectivity

INTERNATIONAL CONNECTIVITY PROVIDERS IN SINGAPORE

- International Connectivity in Singapore is offered by a multitude of
  - local
  - regional
  - international Communications Service Providers (CSP)

⇒ Healthy competition for International Connectivity in the Singapore.
International and Domestic Broadband Connectivity in Singapore

**International Connectivity**

Cable Landing Stations in Singapore

- **CLS Changi**
- **CLS Tuas**
- **CLS Katong**
## International Connectivity

- The design capacity of international cable systems in service has increased since 2011 by 29%

- The design capacity of international cable systems planned has increased by 156% since 2011

- A number of new systems planned are delayed

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<table>
<thead>
<tr>
<th>No.</th>
<th>Cable Systems (In-Service)</th>
<th>Design Capacity (TB)</th>
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<tr>
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<td>AAG</td>
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<tr>
<td>3</td>
<td>APCN-2</td>
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<td>4</td>
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<td>5</td>
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<tr>
<td>6</td>
<td>i2i</td>
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<td>7</td>
<td>Matrix</td>
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<td>8</td>
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<td>Sea-Me-We-3</td>
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<td>13</td>
<td>TGN-TIC</td>
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<td>14</td>
<td>TISICS</td>
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<table>
<thead>
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<th>No.</th>
<th>Cable Systems (Planned)</th>
<th>Design Capacity (TB)</th>
<th>Planned</th>
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<tr>
<td>1</td>
<td>APG</td>
<td>54.00</td>
<td>2011-2014</td>
</tr>
<tr>
<td>2</td>
<td>ASE</td>
<td>15.00</td>
<td>2012-2014</td>
</tr>
<tr>
<td>3</td>
<td>ASC</td>
<td>16.00</td>
<td>mid-2013</td>
</tr>
<tr>
<td>5</td>
<td>AAG 2</td>
<td>?</td>
<td>2016</td>
</tr>
<tr>
<td>6</td>
<td>APX-West</td>
<td>32</td>
<td>2015</td>
</tr>
<tr>
<td>7</td>
<td>ASC (Australia-Singapore Cable)</td>
<td>12</td>
<td>2015</td>
</tr>
<tr>
<td>8</td>
<td>Asia Africa Europe (AAE-1)</td>
<td>40</td>
<td>2016</td>
</tr>
<tr>
<td>9</td>
<td>BBG (Bay of Bengal Gateway)</td>
<td>8</td>
<td>2014</td>
</tr>
<tr>
<td>10</td>
<td>BRICS Cable</td>
<td>12.8</td>
<td>2015</td>
</tr>
<tr>
<td>11</td>
<td>SEA-ME-WE 5</td>
<td>24</td>
<td>2016</td>
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</table>

Total Capacity planned 2014: 226.60
Total Capacity planned 2016: 320.93

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- Public –  Dieter Sieber / IIC Singapore – TRPC Forum
- 4/1/2014
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**International Connectivity**

**Technology Development**

- 10GB Wavelength is today's wholesale standard
- 100GB deployment started and becomes an attractive alternative for customers with high bandwidth demand
- Continued decline of SDH/SONET
- Strong Growth of Ethernet
International Connectivity

Traffic Distribution

- Traffic share from Asia to the U.S. and Canada is falling.  
  2009 = 48%, 2013 = 40 percent

- “One key reason for the declining share of Asian capacity accounted for by the trans-Pacific route is the sourcing of content closer to Asia,” said TeleGeography analyst Cody Williams.

- Trans-Pacific capacity increased 32% in 2013. Intra-Asian capacity growth by 44% and capacity on routes between Asia and Europe grow by 42%.

- The decline in the share of Asian international Internet bandwidth connected to the U.S. and Canada has been largely picked up by Europe. The share of Asian Internet bandwidth connected to Europe has increased from 21% in 2009 to 28% in 2013.

- Hong Kong, Singapore and Tokyo have been established as regional hubs for exchanging traffic and hosting content.
International Connectivity

**FIGURE 4**
Median FastE EoMPLS Prices in Asia, H2 2010-H2 2013

*Notes: Each line represents the median monthly lease price for an EoMPLS FastE circuit on the listed route. Prices are in USD and exclude local access and installation fees. FastE = 100 Mbps.*

*Source: TeleGeography © 2013 Primetrica, Inc.*
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International Connectivity

Prices for International Bandwidth 10GB (kUSD)

Data Source: Telegeography
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International Connectivity

Prices for International Bandwidth 10GB (USD)

Data Source: Telegeography
Domestic Connectivity
Domestic Connectivity

- Backhaul
- Local Access
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Domestic Connectivity

DOMESTIC CONNECTIVITY PROVIDERS IN SINGAPORE

-Backhaul-
(Connections from Cable Landing Stations to Telehouses/Data Centers)
are offered by

- Singapore Telecom (Incumbent)
- Starhub
- Some International CSP

- Limited competition in the Singapore Backhaul market.

- In 2009 iDA released SingTel from its Dominant Licensee Obligation for Backhaul despite strong objections from the Industry. Overall the situation remains unchanged up to today.
Domestic Connectivity

Technology Development - Backhaul -

- 10GB Wavelength is today's wholesale standard
- Some first 100GB deployments
- Continued decline of SDH/SONET
- Strong Growth of Ethernet

Market Environment

- Up to today Fibers are offered only by niche-players, not by the major players
- Several Cable Systems connect directly to the Telehouse/DC eliminating the Cable Landing Station and the backhaul connection.
Domestic Connectivity

Prices for Backhaul Capacity

- No real comparison possible due a fragmented market (use/eliminating of backhaul capacity, capacity/Fiber)
- Most international CSP use backhaul for internal use only but not reselling it as a stand-alone product
- Business swap-deals
Domestic Connectivity

- Backhaul
- Local Access
International and Domestic Broadband Connectivity in Singapore

Domestic Connectivity

DOMESTIC CONNECTIVITY PROVIDERS IN SINGAPORE

-Local Access-
(Connections from Telehouses/Data Centers to Customer Location)
are offered by:

- Singapore Telecom (Incumbent)
- Starhub
- Nucleus Connect (Next Generation Nationwide Broadband Network) designed and build for Consumers and SME but not for MNC

→ Limited competition in the Singapore Local Access (last mile) market.
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Domestic Connectivity

Technology Development - Local Access -

- Continued decline of Clear Channel demand
- Strong Growth of Ethernet
- Standard Bandwidth growing from 2MB to multiple 2MB or 10MB
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Domestic Connectivity

SINGAPORE ACCESS MARKET

- Since 2009 Singapore has made a significant effort to enhance competition between the three telecom networks in light of the dominance of SingTel in the fixed line market by promoting a Next Generation Nationwide Broadband Network or NGNBN.

- NGNBN is not delivering the effects of competition to the local access market and this is reflected in Singapore’s still poor showing in comparison with Hong Kong due to the architecture of the NGNBN which has been designed to focus only on the consumer/SME but not for MNCs.

- Singapore’s overall global competitiveness is profoundly dependent upon the quality and cost of its communications.

- In terms of quality Singapore can compete with the best, although in terms of scope of services there is room for improvement.
In terms of prices Singapore’s dominant carriers appear to be satisfied with being cheaper than its immediate neighbors. But, Singapore remains significantly less competitive than Hong Kong. This pushes up end-user prices in Singapore.

Estimates from APCC sources of the proportion of international circuit costs that are accounted for by the Singapore local access portion can range anywhere from 40%-70%. In part these percentages are the result of falling international cable costs, so the older percentages were closer to 40%, but it means that price falls in Singapore have not kept pace with industry trends. This brings extra margins of profit to local CSP but extra costs to end-users and thereby reduces the competitive appeal of Singapore.

As the data shows, Singapore prices have fallen, but the gap to Hong Kong is increasing. Competition is not just about price levels but also about price comparisons.
Domestic Connectivity

LOCAL ACCESS COSTS FOR -LEASED LINES-

- The comparison with 2009 shows that there have been some price reductions for leased lines but a concern is that for 2048Kbps and 45Mbps prices have risen above 2009 levels and these are increasingly the more in demand bitrates used by end-customers.

- The table below therefore measures the multiples of Singapore’s simple leased line prices over Hong Kong prices. 
(Anything below 1.0 would indicate Singapore prices lower than Hong Kong prices, but in fact the lowest multiple is around 1.5, and most multiples are between 2 and 4, and two above 6 and 8. Measuring in real or nominal terms makes little difference)

Most surprising is that the multiples have increased since 2009 in all cases.

<table>
<thead>
<tr>
<th>Bitrate</th>
<th>2012 Prices</th>
<th>2009 Prices</th>
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<tbody>
<tr>
<td>64 kbps</td>
<td>2.3</td>
<td>1.8</td>
</tr>
<tr>
<td>256 kbps</td>
<td>2.7</td>
<td>2.1</td>
</tr>
<tr>
<td>512 kbps</td>
<td>2.8</td>
<td>2.2</td>
</tr>
<tr>
<td>1536 kbps</td>
<td>3.6</td>
<td>2.8</td>
</tr>
<tr>
<td>1984 kbps</td>
<td>3.9</td>
<td>3</td>
</tr>
<tr>
<td>2048 kbps</td>
<td>3.3</td>
<td>2.5</td>
</tr>
<tr>
<td>34 Mbps</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>45 Mbps</td>
<td>2.3</td>
<td>1.8</td>
</tr>
<tr>
<td>155 Mbps</td>
<td>2.2</td>
<td>1.7</td>
</tr>
</tbody>
</table>
Domestic Connectivity

2km simple circuit monthly rental charges (2048kbps)

- Australia
- China
- Hong Kong
- India
- Indonesia
- Japan
- Malaysia
- New Zealand
- Philippines
- Singapore
- South Korea
- Taiwan
- Thailand
- Vietnam

USD
LOCAL ACCESS COSTS FOR -ETHERNET P2P-

- Clearly, Singapore does not rank competitively for Ethernet P2P.
- The table below shows the multiples for Singapore over Hong Kong for Ethernet P2P connections for MRC.

<table>
<thead>
<tr>
<th></th>
<th>Singapore MRC prices as a multiple of Hong Kong prices for Ethernet P2P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2012 prices</td>
</tr>
<tr>
<td>2Mb/s</td>
<td>1.8</td>
</tr>
<tr>
<td>10Mb/s</td>
<td>2.4</td>
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<td>50Mb/s</td>
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<tr>
<td>100Mb/s</td>
<td>3.2</td>
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<tr>
<td>1Gb/s</td>
<td>3.2</td>
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<tr>
<td>10Gb/s</td>
<td>1.1</td>
</tr>
</tbody>
</table>
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Domestic Connectivity

![Graph showing Ethernet monthly rental including installation charges for various countries. Hong Kong and Singapore are highlighted with red circles.](image)

*Note: 1. Prices are simple averages across the available data, in USD; 2. Installation is distributed over 12 months.*
Summary
Summary

- **Singapore remains a well connected location** with abundance of international submarine cables landing in Singapore and providing connectivity within the Asia Pacific Region and to all other global regions at comparable cost for the region.
- **International capacity cost in the APAC region remain among the highest in the world.**
- Singapore has one of the most technologically sophisticated telecommunication networks in Asia Pacific.
- Singapore continues with all efforts to stabilizing its role as a Regional Telecommunications Hub with the ambition to develop to the major regional hub.
- **Domestic Competition remains limited compared to most other comparable markets in the region.**
- **Prices overall are not competitive and not supporting the anticipated role for Singapore as a regional hub.**
THANK YOU!

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