T-Systems Singapore

IIC Asia Forum
Singapore as a Data Hub

Cost of Connectivity for Data Centers

Singapore, 16 November 2011.
CONTENTS.

Connectivity of Singapore.
Development of Network Traffic.
Cost of Connectivity.
How competitive is Singapore?
Deutsche Telekom/T-Systems
Deutsche Telekom AG is one of the world's leading telecommunications and information technology service companies. We have almost 200 million customers and offer them all kinds of products and services for connected life and work. Deutsche Telekom has an international focus and is represented in approximately 50 countries. In 2010, the Group generated revenue of EUR 62.4 billion, over half of it outside of Germany. It has 247,000 employees.

T-Systems is Deutsche Telekom’s corporate customer arm. Using a global infrastructure of data centers and networks, T-Systems operates information and communication technology (ICT) systems for multinational corporations and public sector institutions. With offices in over 20 countries and global delivery capabilities, T-Systems serves companies in all industries – from the automotive industry to telecommunications, the financial sector, retail, services, media, energy and the manufacturing industry all the way to government agencies and the healthcare sector. Approximately 47,600 employees worldwide use their industry expertise and ICT know-how to provide top-quality service. T-Systems generated revenue of around EUR 9.1 billion in the 2010 financial year.
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Cost of Connectivity for Data Centers

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The content of this presentation should not be considered as an official statement of Deutsche Telekom Group.
Connectivity of Singapore
Data Centre Locations in Singapore
Cables landing in Singapore

<table>
<thead>
<tr>
<th>Cables</th>
<th>Landing Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>APG</td>
<td>SMW-4</td>
</tr>
<tr>
<td>i2i</td>
<td>TGN-TIC</td>
</tr>
<tr>
<td>SMW-3</td>
<td></td>
</tr>
<tr>
<td>ASE</td>
<td>SJC</td>
</tr>
</tbody>
</table>

- **CLS Changi**
- **CLS Tuas**
- **CLS Katong**
- **APCN-2**

**Connectivity of Singapore**

**APC**

- **AAG**
- **Matrix**
- **APCN**
- **MIC-1**
- **BSCS**
- **TGN-IA**
- **EAC-C2C**
### SUBMARINE CABLES LANDING IN SINGAPORE

<table>
<thead>
<tr>
<th>No.</th>
<th>Cable System (In-Service)</th>
<th>Design Capacity (TB)</th>
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<tbody>
<tr>
<td>1</td>
<td>AAG</td>
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<td>2</td>
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<td>3</td>
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<td>BSCS</td>
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<td>EAC-C2C</td>
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<td>6</td>
<td>i2i</td>
<td>8.4</td>
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<tr>
<td>7</td>
<td>Matrix</td>
<td>2.6</td>
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<tr>
<td>8</td>
<td>MIC-1</td>
<td>0.01</td>
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<tr>
<td>9</td>
<td>Sea-Me-We-3</td>
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<td>10</td>
<td>Sea-Me-We-4</td>
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<td>11</td>
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<td>12</td>
<td>TGN-TIC</td>
<td>5.12</td>
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<td>Total Capacity in Service</td>
<td>58.69</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Cable System (Planned)</th>
<th>Design Capacity (TB)</th>
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</thead>
<tbody>
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<td>2</td>
<td>ASE</td>
<td>15.00</td>
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<tr>
<td>3</td>
<td>ASC</td>
<td>16.00</td>
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<tr>
<td>4</td>
<td>SJC</td>
<td>17.00</td>
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<tr>
<td>5</td>
<td>WAC</td>
<td>6.00/8.00</td>
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<tr>
<td></td>
<td>Total Capacity planned</td>
<td>59.00</td>
</tr>
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</table>

**Total Capacity 2013: 117.69**
Development of Network Traffic
Asian International Bandwidth Usage, 2006-2010

Source: TeleGeograpy
Worldwide international bandwidth growth, 2006-2011

Source: TeleGeography
Video Traffic Dominates

Source: Blue Coat
Operators Are Rapidly Adding New Capacity

International Internet Bandwidth, 2002-2011

Source: TeleGeography

T-Systems
Global Appetite for Bandwidth Should Remain Strong

Source: TeleGeography

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Singapore as Data Hub | Development of Traffic

Pace of Regional Growth Varies

Source: TeleGeography
Singapore is the fastest growing major Internet hub in Asia.

Source: TeleGeography
Cost of Connectivity
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Source: Allied Fibre
How the World Connects

Source: TeleGeography
The Pace of Erosion Varies

Median 10 GigE IP Transit Price Change, 2008-2011

Source: TeleGeography
IP Transit is Not Always Cheap

Median Monthly GigE IP Transit Prices, Q2 2011

Source: TeleGeography
Price reflects median monthly lease price of a GigE port with a CDR of 1.0 Gbps

Source: TeleGeography
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International connectivity pricing 10 Gbps

Source: TeleGeography
How competitive is Singapore?
Singapore has an ideal geographic location for a regional hub

All important international cables systems land in Singapore

Available capacity should be sufficient for the next years

However, the current price level for connectivity services does not yet support fully to make Singapore a major Data Centre Hub for the region

Conclusion:

Singapore has all the pre-requisites to become the Data Centre Hub of South East Asia

provided

prices will develop to a level supporting such a position
Thank you.

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