A tale of prices
Latin America vs. The rest of the world

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A few words of caution

• TeleGeography has collected pricing data anonymously from operators around the world since 1998. We also confer with buyers to validate market price levels.

• The prices shown on subsequent slides are **weighted median** prices for a **single** unit for a **one-year** term.
  • A broad range of prices exists for all routes/cities.
  • Substantial discounts exist for higher volumes and longer terms.
  • Discounts also exist depending on who you are (carrier or content/cloud provider) and the broader commercial relationship.
Once upon a time ...

Andy, the Little Carrier, wanted to buy bandwidth. But Andy was sad. Bandwidth was so expensive!

Then, something magical happened .... prices fell, yay!

“I wonder what happened?,” thought Andy.
Part 1 -

• Bandwidth demand keeps growing
• New supply and competition fuel price erosion, particularly on less developed routes
• Transit is more expensive in markets that remain largely dependent on long-haul links to Europe or the U.S.
Overall worldwide bandwidth growth

Worldwide International Bandwidth Usage

- Used International Bandwidth (Tbps)
- Annual Growth

Bandwidth growth – Latin America vs. Rest of the world

Used International Bandwidth Growth by Region, 2013-2017

<table>
<thead>
<tr>
<th>Region</th>
<th>Compound Annual Growth, 2013-17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>50%</td>
</tr>
<tr>
<td>Asia</td>
<td>60%</td>
</tr>
<tr>
<td>Europe</td>
<td>50%</td>
</tr>
<tr>
<td>Latin America</td>
<td>40%</td>
</tr>
<tr>
<td>Middle East</td>
<td>40%</td>
</tr>
<tr>
<td>Oceania</td>
<td>30%</td>
</tr>
<tr>
<td>U.S. &amp; Canada</td>
<td>60%</td>
</tr>
</tbody>
</table>
Demand in Latin America doubling every two years
Demand within Latin America varies greatly

**International Bandwidth Usage by Country**

- **Brazil**: 20 Tbps
- **Mexico**: 15 Tbps
- **Argentina**: 10 Tbps
- **Colombia**: 5 Tbps
- **Ecuador**: 1 Tbps
- **Bolivia**: 0 Tbps

*2013-2017 CAGR*
Lots of interest in new cables

Cable Construction Costs by Region, 2015-2020
Competition drives down prices

Weighted Median 10 Gbps Wavelength Price Trends, 2015-2018

- Miami - São Paulo
- Los Angeles - Tokyo
- Hong Kong - Singapore
- London - New York
Price ranges vary by routes

Weighted Median and Price Range 10 Gbps Wavelength, Q3 2018

<table>
<thead>
<tr>
<th>Route</th>
<th>Monthly Price Range (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miami - São Paulo</td>
<td>$25,000</td>
</tr>
<tr>
<td>Los Angeles - Tokyo</td>
<td>$10,000</td>
</tr>
<tr>
<td>Hong Kong - Singapore</td>
<td>$15,000</td>
</tr>
<tr>
<td>London - New York</td>
<td>$5,000</td>
</tr>
</tbody>
</table>
As regional capacity grows, prices fall

Weighted Median 10 Gbps Wavelength Price Trends

- Bogota – Miami
- Buenos Aires - São Paulo
- Miami - Santiago
- Miami - Santiago
- Buenos Aires - Miami
- Dallas - Mexico City
- Miami - São Paulo
The U.S. and Europe remain as major hubs

Used Inter-Regional Bandwidth, 2017
IP Transit costs less in the U.S. and Europe

Weighted Median 10 GigE IPT, Q3 2018

Bar chart showing the weighted median 10 GigE IPT costs in different cities for Q3 2018 in USD per Mbps per month. São Paulo has the highest cost, followed by Singapore, London, Los Angeles, New York, and Miami. The chart also includes the Compound Annual Growth Rate (CAGR) for the period 2015-2018.
Latin America vs. U.S.

10 GigE IPT Price Multiple - Miami

- Bogota
- Buenos Aires
- Lima
- São Paulo

Price Multiple:
- 2015
- 2018
Part 2 -

- Subsea capacity is not necessarily the largest cost
- Last mile, the longest mile (not figuratively, but financially)
- The cost to interconnect to the data center
Wet capacity vs. backhaul

Median PoP-to-PoP 10 Gbps Price Components, 2017
Last mile, the longest mile

Monthly Price Ranges for 10 Mbps Ethernet, 0-5 km, H2 2017

<table>
<thead>
<tr>
<th>City</th>
<th>Price Range (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>São Paulo</td>
<td>$3,000-$3,500</td>
</tr>
<tr>
<td>New York</td>
<td>$2,500-$3,000</td>
</tr>
<tr>
<td>London</td>
<td>$2,000-$2,500</td>
</tr>
<tr>
<td>Frankfurt</td>
<td>$2,000-$2,500</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>$1,000-$1,500</td>
</tr>
</tbody>
</table>

Median prices are indicated by the dark bars.
Connecting to the data center

Total Cost of Ownership per Month, One Cross Connect, H1 2018

<table>
<thead>
<tr>
<th>City</th>
<th>Total Cost of Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hong Kong</td>
<td>$2,300</td>
</tr>
<tr>
<td>New York</td>
<td>$2,200</td>
</tr>
<tr>
<td>Frankfurt</td>
<td>$1,800</td>
</tr>
<tr>
<td>London</td>
<td>$1,400</td>
</tr>
<tr>
<td>Buenos Aires</td>
<td>$1,200</td>
</tr>
</tbody>
</table>
What did Andy learn?

Prices are falling in Latin America. But it is still cheaper to buy transit in the U.S.

And there are a lot of other costs to consider.

‘I am happy I learned all this new stuff’, thought Andy.

~ The end ~
Thank you!

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