Int’l Bandwidth and Pricing Trends

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Analyst, TeleGeography
What we’ll cover

• Int’l bandwidth – where and how much
• How does Africa fit in the puzzle
• Pricing... how much
• Where’s the cloud now
• What’s in store for Africa
Global view
How the world connects

Used Inter-Regional Bandwidth, 2017
Whose traffic in those pipes

Source of Used International Bandwidth, 2008-2017
Content share depends where

Share of Used Bandwidth by Category for Major Routes, 2017

- Trans-Atlantic
- Trans-Pacific
- U.S.-Latin America
- Intra-Asia
- Europe-Middle East & Egypt
- Europe-Asia
- Europe-Sub-Saharan Africa

- Internet Backbone Providers
- Content Providers
- Others
How much where? Prices by geography

10G Wavelength MRC, 10G IPT Port MRC, Q2 2018

- Tokyo $2.00
- Los Angeles $0.48
- Miami $0.43
- São Paulo $2.38
- Johannesburg $5.00
- London $0.62

- Singapore $1.39
- Sydney $6.35
- $5,500
- $5,200
- $26,000
- $8,000
- $22,000

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How much where? Prices by geography

10G Wavelength MRC, 10G IPT Port MRC, Q2 2017

- Tokyo: $2.24
- Los Angeles: $0.88
- São Paulo: $4.62
- Johannesburg: $8.55
- London: $0.61

- Singapore: $1.79
- Sydney: $7.51
- Miami: $0.80
- $7,087
- $7,190
- $29,000
- $16,000
- $34,000

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Africa
Africa is out in front for growth

International Internet Bandwidth Growth by Region, 2014-2018
Sub-Saharan Africa

Int’l Internet Bandwidth Growth – Sub-Saharan Africa

![Graph showing international internet bandwidth growth and annual growth for Sub-Saharan Africa from 2014 to 2018.](image-url)
Intra-Africa connectivity

Share of Africa Int’l Internet Bandwidth by Region, 2014-2018

Percent of Internet Bandwidth

<table>
<thead>
<tr>
<th>Year</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
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<tbody>
<tr>
<td>2014</td>
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- Middle East
- U.S. & Canada
- Asia
- Africa
- Europe
Pricing
Caution

- TeleGeography has collected pricing data anonymously from operators around the world since 2002. 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.
Transport prices still dropping

10 Gbps Wavelength Johannesburg-London, 2015-2018
Prices vary by region

10 Gbps Wavelength Lease Price Q2 2017 & Q2 2018
Transit prices follow transport prices

Weighted Median 10 GigE IP Transit Port Prices, Q2 2018

<table>
<thead>
<tr>
<th>City</th>
<th>$/Mbps per Month (USD)</th>
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</thead>
<tbody>
<tr>
<td>Johannesburg</td>
<td>4.00</td>
</tr>
<tr>
<td>Nairobi</td>
<td>4.50</td>
</tr>
<tr>
<td>Lagos</td>
<td>9.00</td>
</tr>
<tr>
<td>Kampala</td>
<td>9.00</td>
</tr>
<tr>
<td>Dar es Salaam</td>
<td>13.50</td>
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</table>
Global IPT prices

Weighted Median 10 GigE IP Transit Port Prices, Q2 2018

[Bar chart showing the weighted median 10 GigE IP Transit Port prices for various cities in Q2 2018.]
What’s next?
Where is the cloud and how do I get there?

Cloud Data Centers and On-Ramps, Q1 2018
Who’s connecting the cloud

Map of Content Provider Submarine Cable Investments

Note: Map shows in service and planned cables with a ready-for-service (RFS) data in 2012 or later. Submarine cables in red are those in which at least one content provider is publicly known to be an investor. Content providers also have capacity on other cables.
## Content provider cable investments

<table>
<thead>
<tr>
<th>Provider</th>
<th>Cable</th>
<th>RFS</th>
<th>Provider</th>
<th>Cable</th>
<th>RFS</th>
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<tr>
<td>Google</td>
<td>Unity</td>
<td>2010</td>
<td>Amazon</td>
<td>Hawaiki</td>
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<td>Southeast Japan Cable (SJC)</td>
<td>2013</td>
<td>JUPITER</td>
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<td>FASTER</td>
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<td>Bay to Bay Express</td>
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<td>Monet</td>
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<td>2017</td>
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<td>2018</td>
<td>Facebook</td>
<td>AEConnect</td>
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<td>Junior</td>
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<td>2018</td>
<td>Asia Pacific Gateway (APG)</td>
<td>2016</td>
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<td>Pacific Light Cable Network (PLCN)</td>
<td>2019</td>
<td>MAREA</td>
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<tr>
<td>INDIGO-West</td>
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<td>Pacific Light Cable Network (PLCN)</td>
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<td>2019</td>
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<td>Hong Kong-Americas (HKA)</td>
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<td>2020</td>
<td>Bay to Bay Express</td>
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<td>MAREA</td>
<td>2018</td>
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</tbody>
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Note: Only publicly disclosed content provider investments shown.
Outlook

- Content provider traffic growing on U.S.-Latam, Eur-Africa routes
- Prices continue to drop faster in Africa
- Intra-African traffic poised for jump in growth?
Thank You!
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