

Why Smart People Do Stupid Things:

Submarine Cables, Network Oversupply,
and the Inexorable Decline of IP Transit Prices

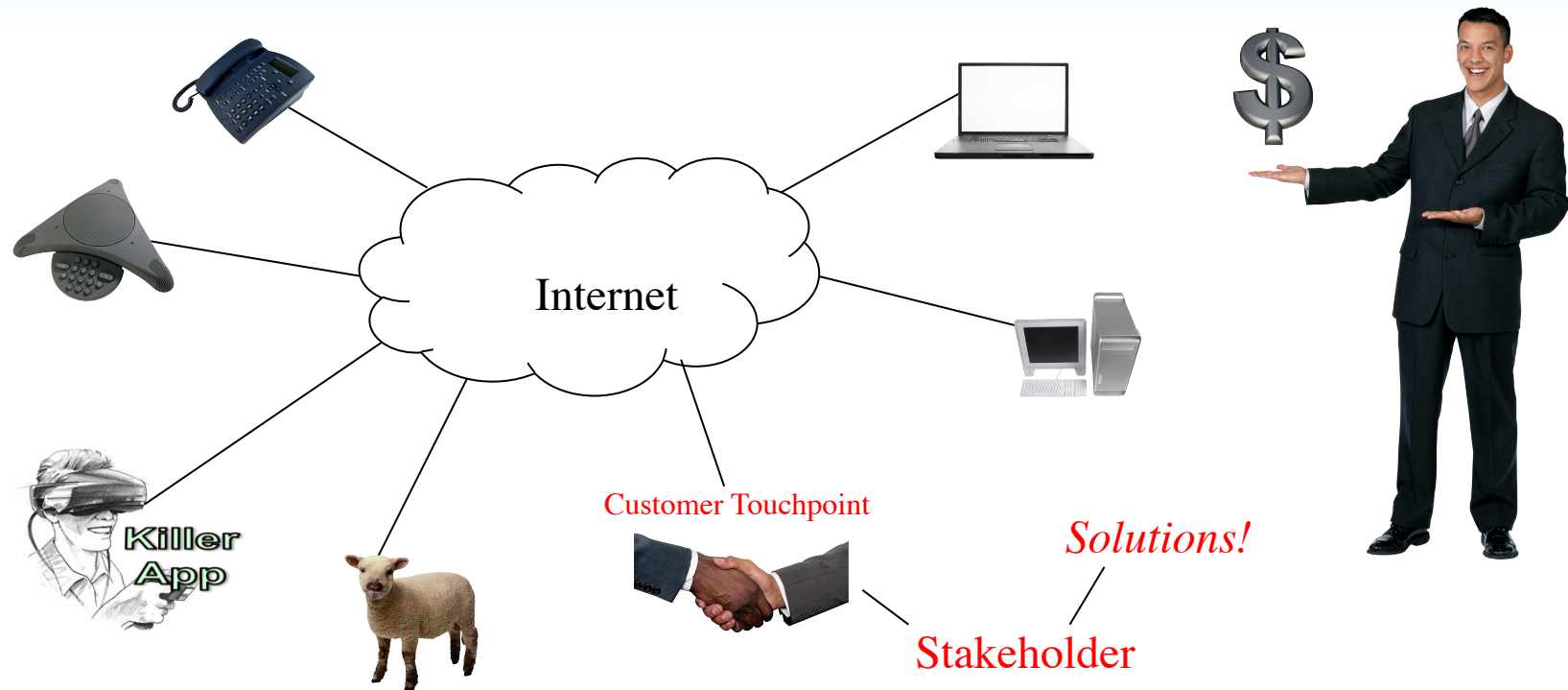
Tim Stronge
TeleGeography
NANOG 62

Introduction

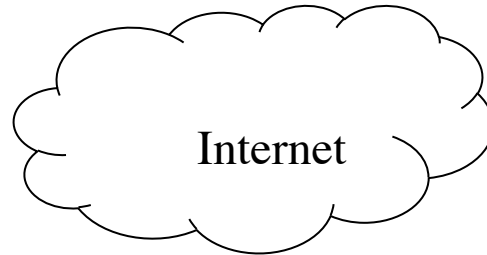
- Hello.
- My name is Tim. ←
- I come in peace.

(Alien)

How Carriers See the Internet



How Carriers See the Internet

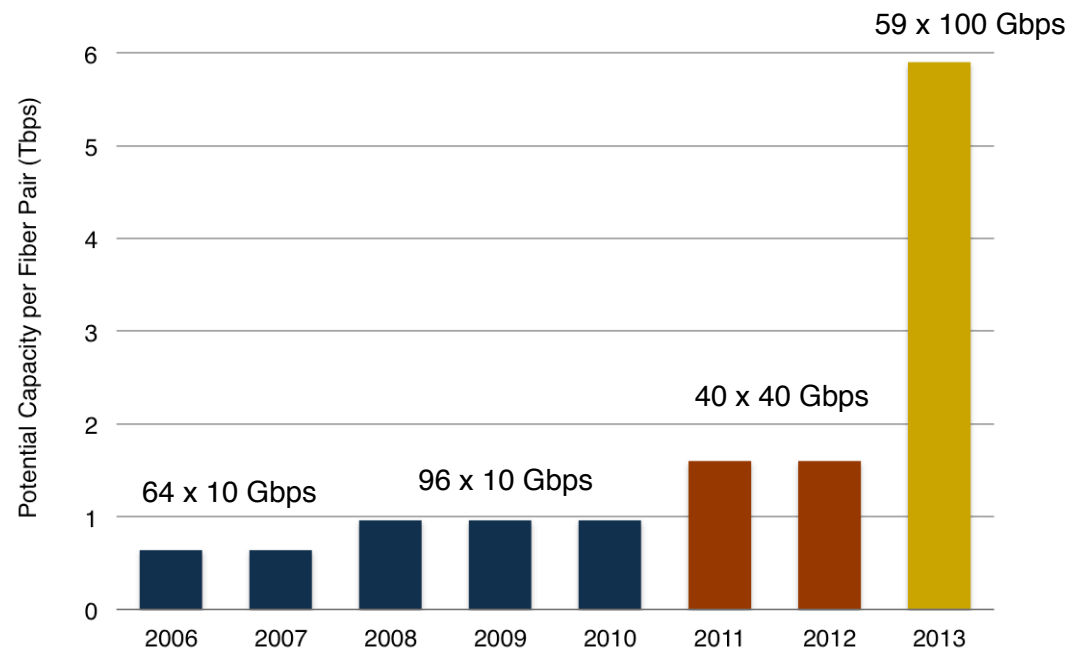


Topics to Cover

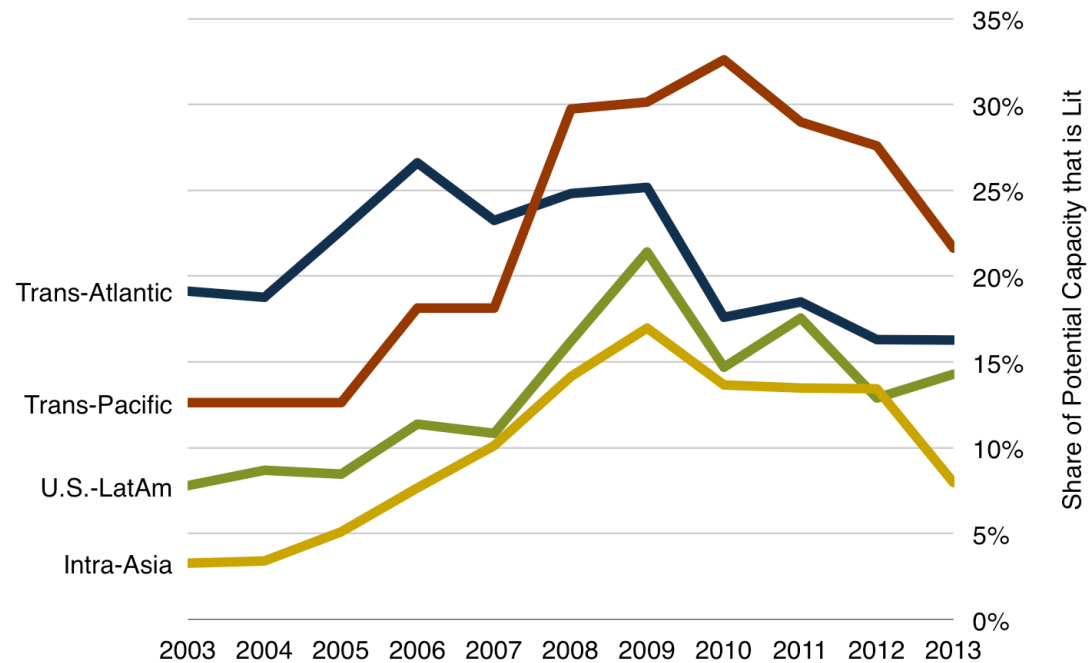
- Where is new infrastructure investment occurring?
- *Why* is there new cable investment occurring?
 - Is it truly a case of people doing stupid things?
- Will this new investment push down prices?
- Will we ever reach a global bandwidth "singularity" in which transport and IPT will be priced the same no matter the location?

From a 10G to a 100G World

Potential Capacity per Fiber Pair on FALCON Cable

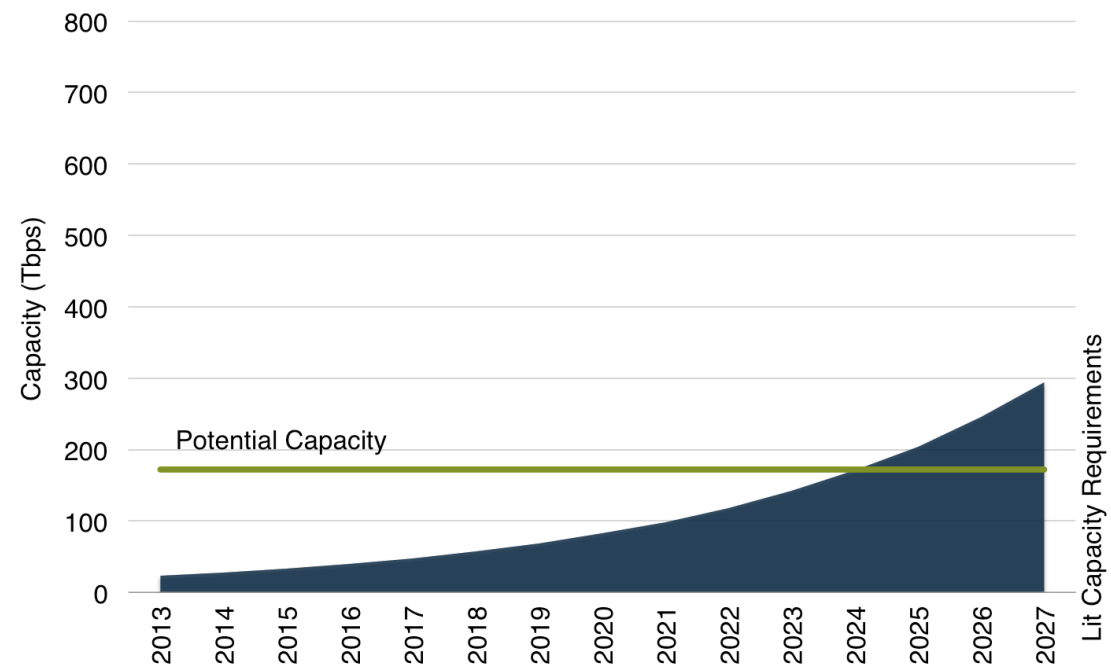


Lots of Investment ... in Old Cables



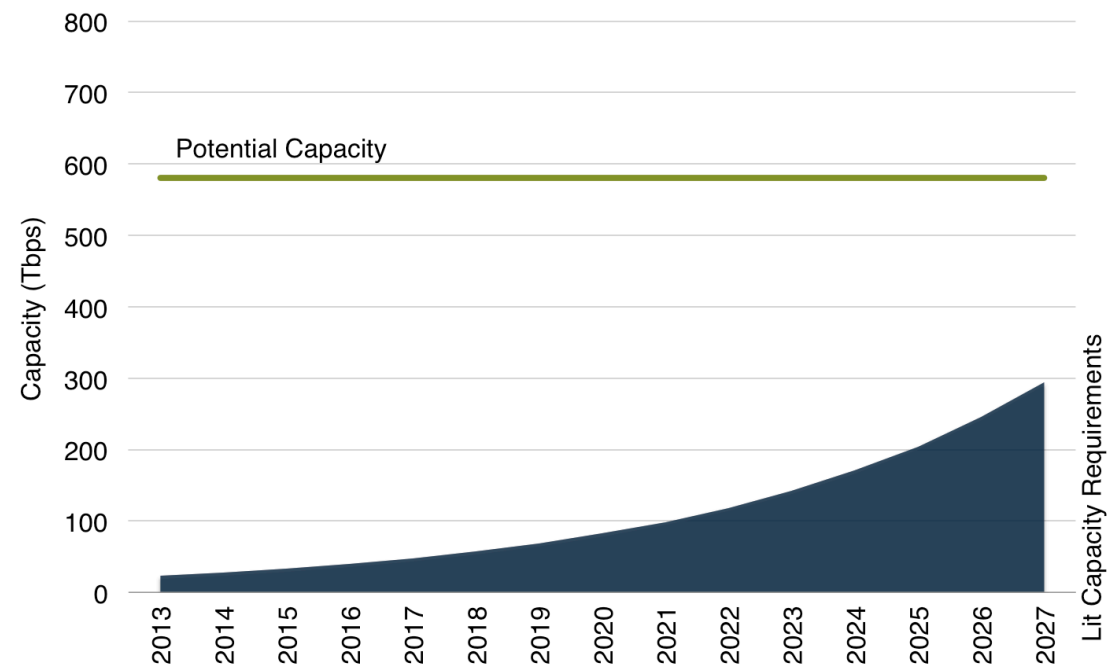
Trans-Atlantic Potential Capacity

Potential Capacity as Currently Announced by Operators



Trans-Atlantic Potential Capacity

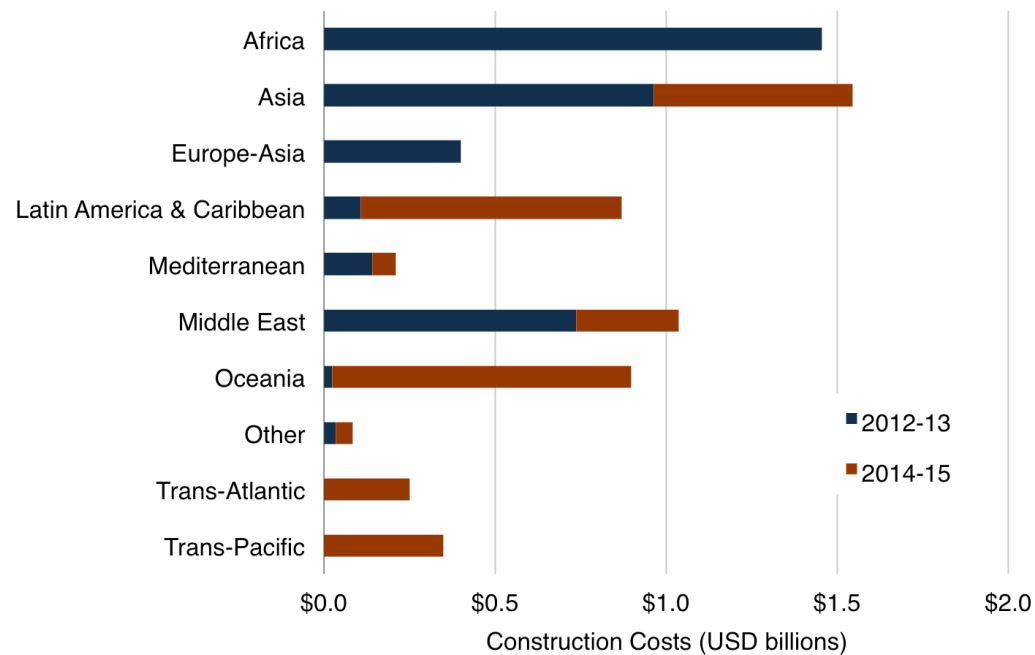
Potential Capacity if 100 x 100G Wavelengths per Fiber Pair



So No One is Bothering to Build New Cables ...
Right?

Wrong.

Construction Cost of New Submarine Cables by Region, 2012-2015



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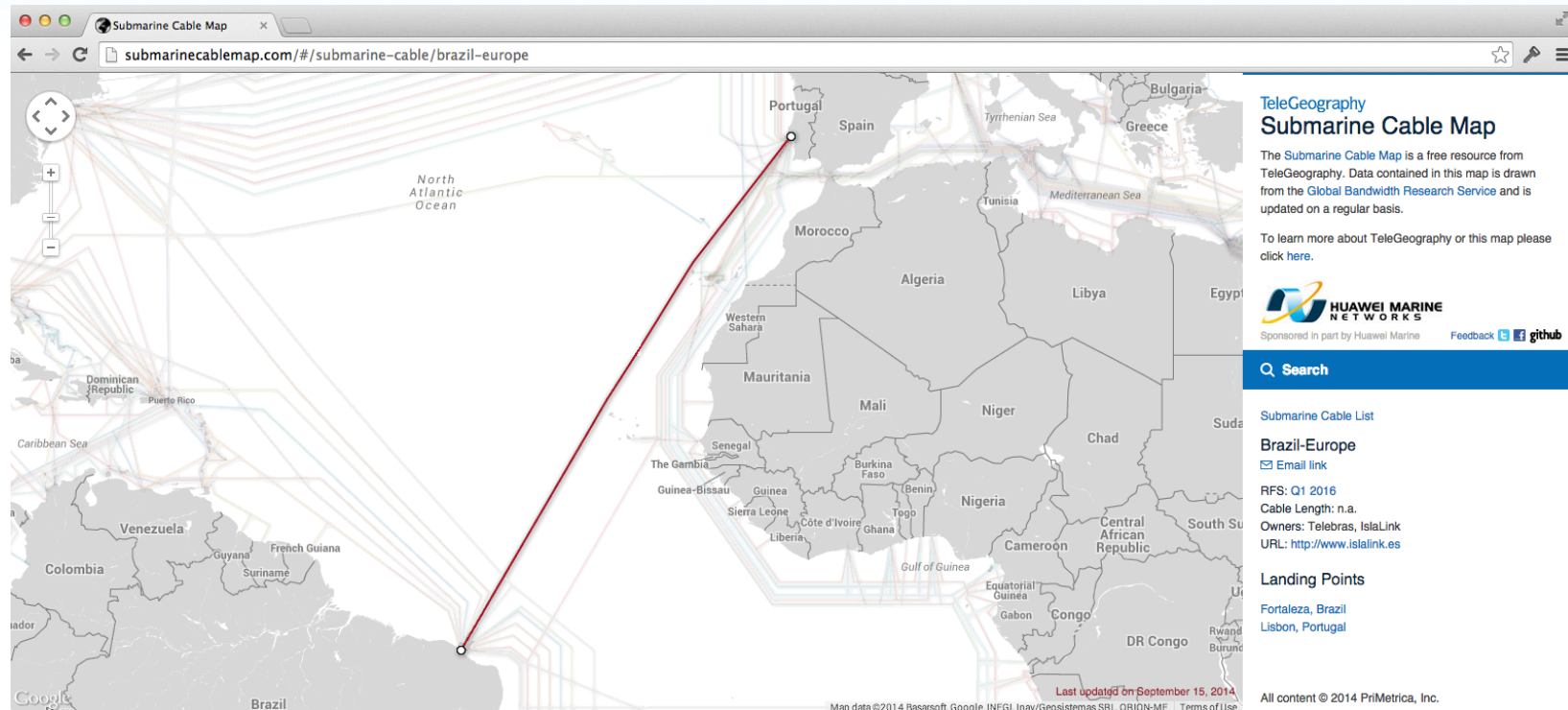
Why Build *New* Cables?

- The Dumb Reasons
 - National pride
 - Corporate pride (for some companies, leasing capacity is not "cool")
 - 3rd-party developers look at a cable map and see empty space without any lines

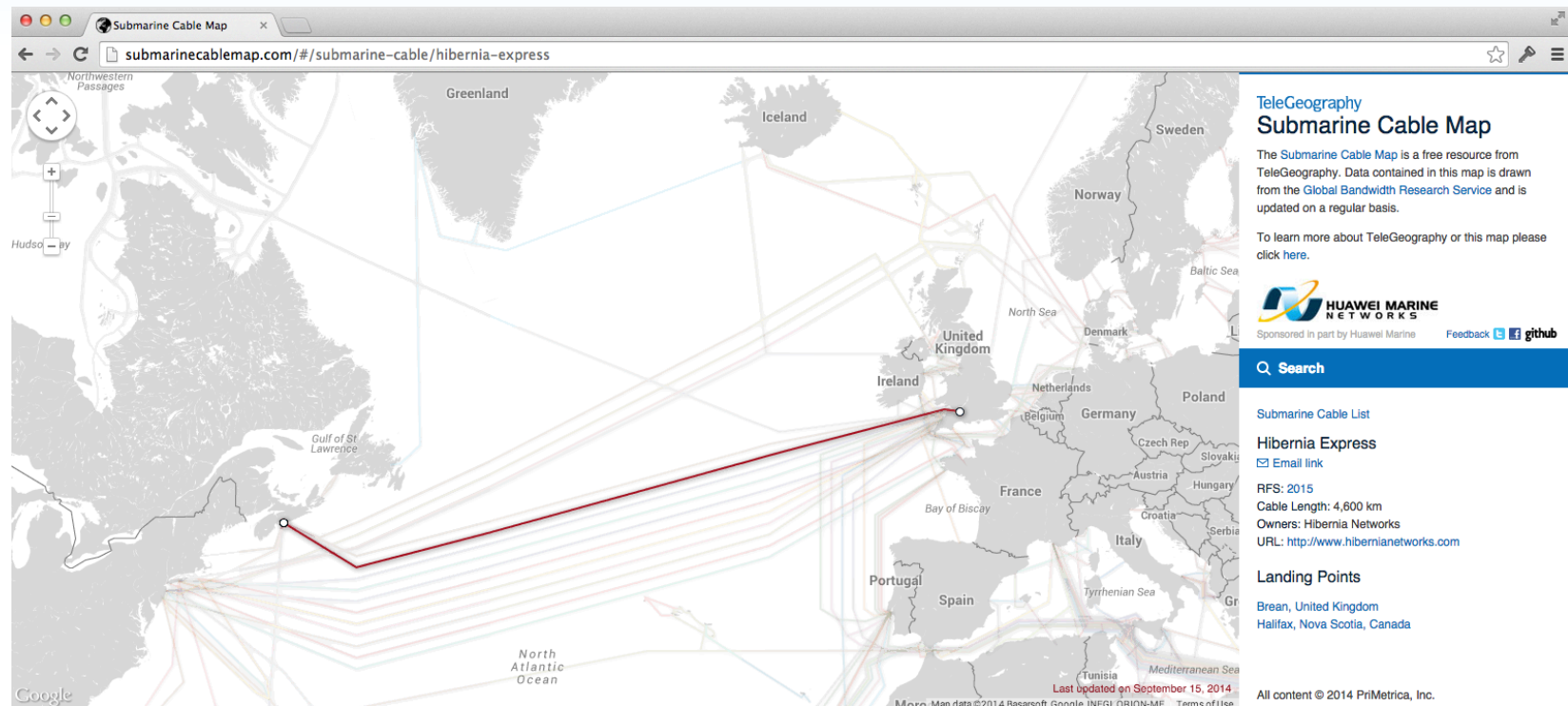
Why Build *New* Cables? (cont'd)

- The Not-Dumb Reasons
 - Capacity exhaustion
 - Connecting new markets
 - Providing physical diversity
 - Supplying niche markets (trans-Atlantic financials, oil/gas, mining)
 - Economies of scale of ownership
- Microeconomic logic \neq macroeconomic logic
 - A company may want to build a cable of its own even if there's plenty of spare capacity in the market.

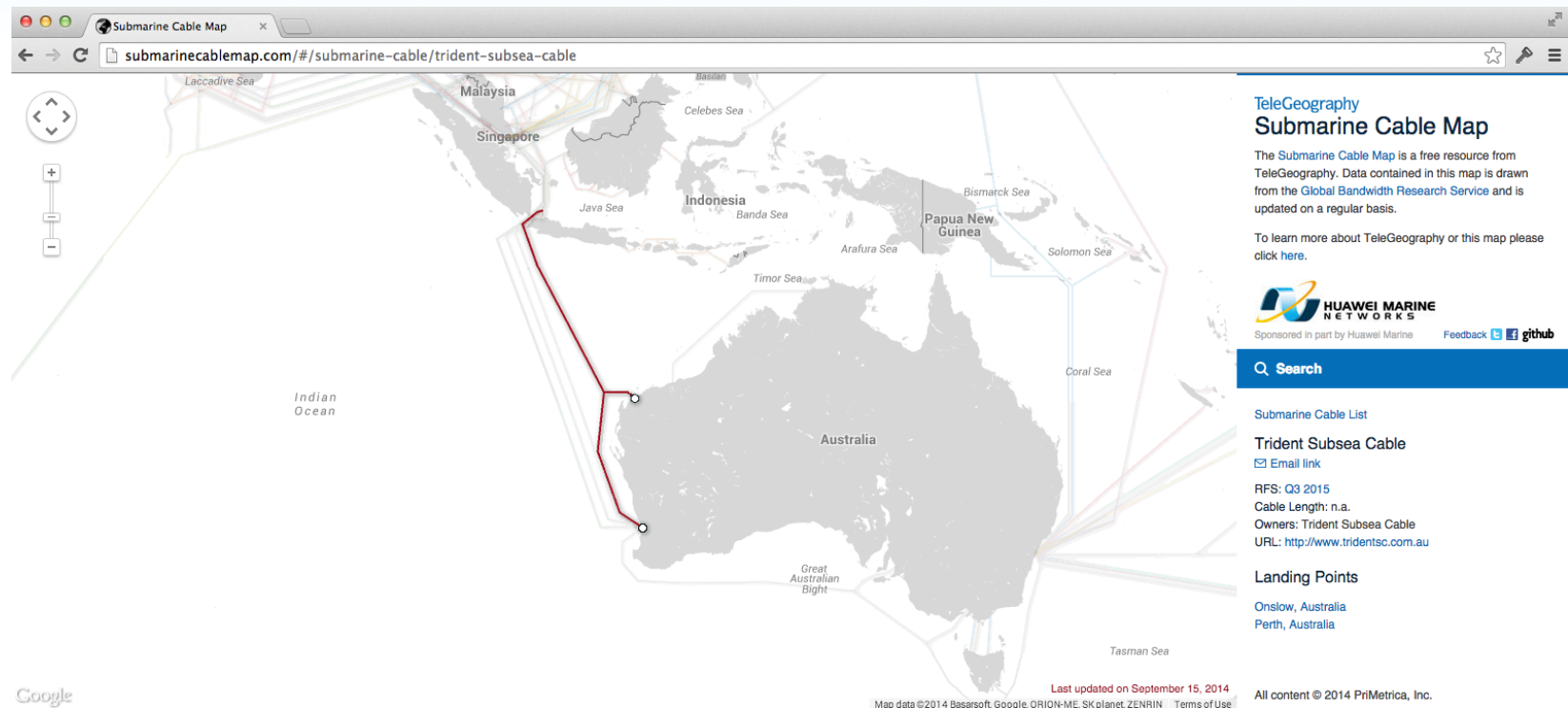
Planned Cables: Brazil-Europe



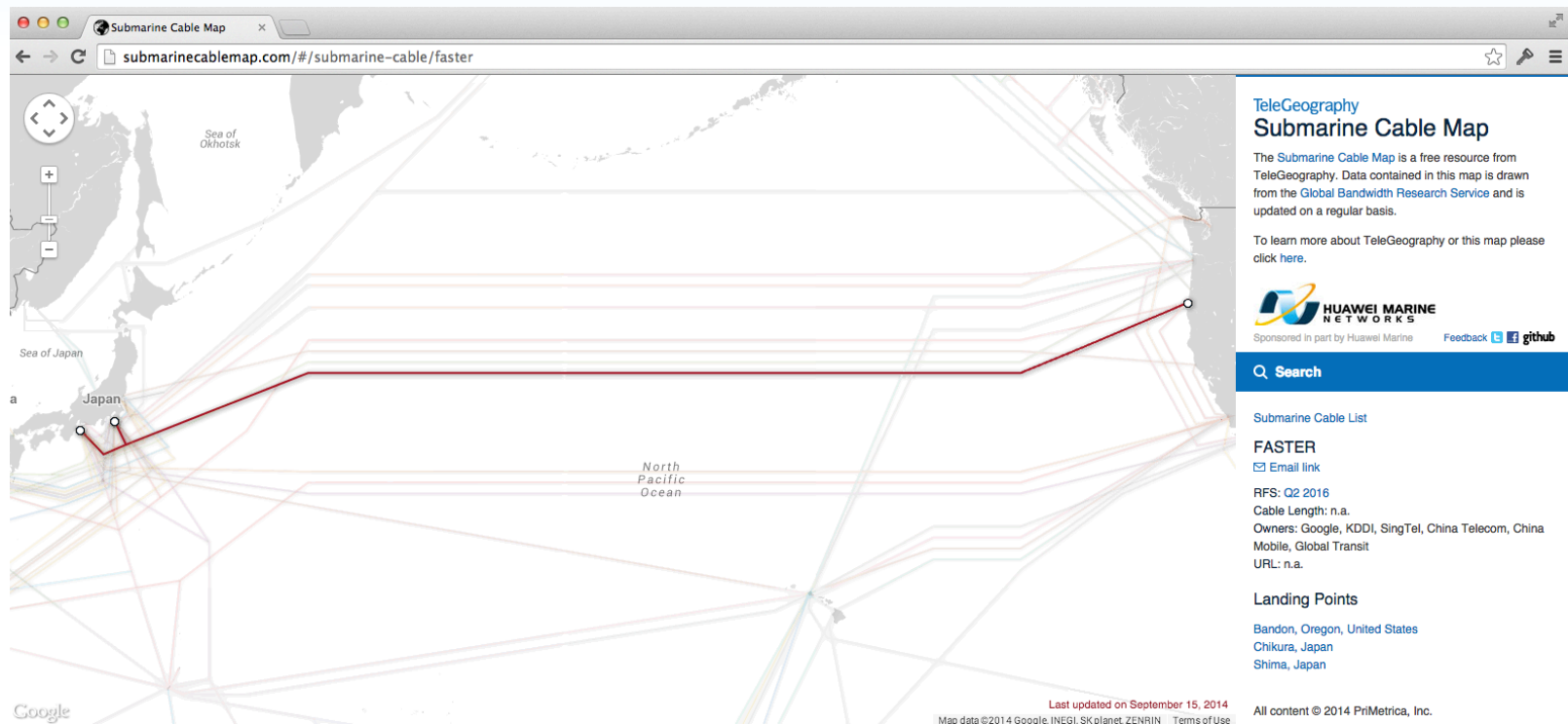
Planned Cables: Hibernia Express



Planned Cables: Trident



Planned Cables: FASTER

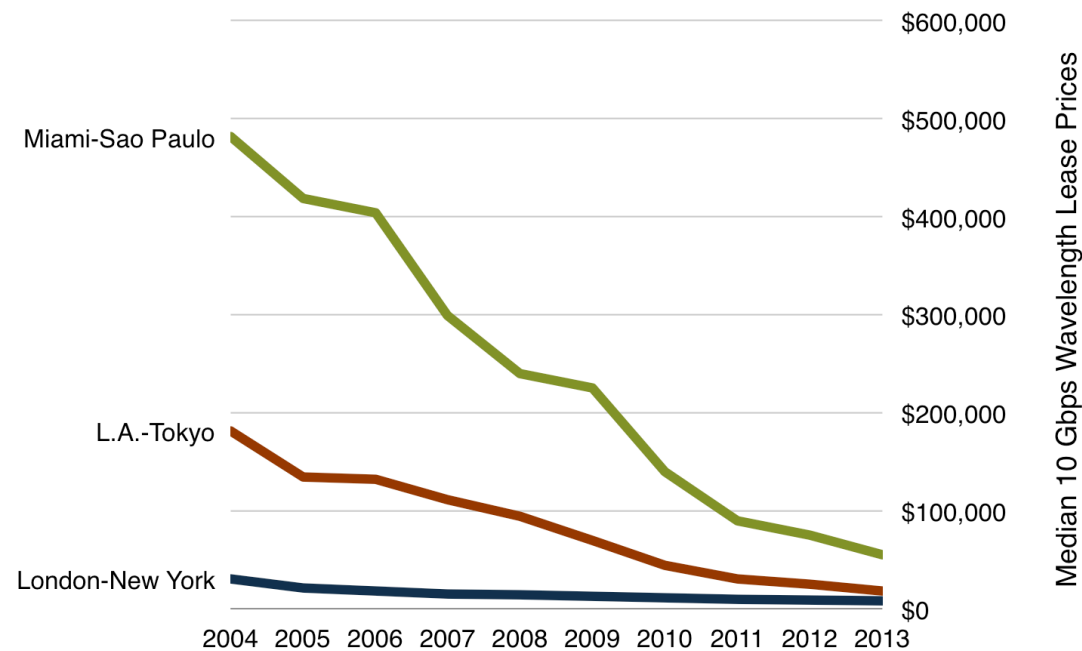


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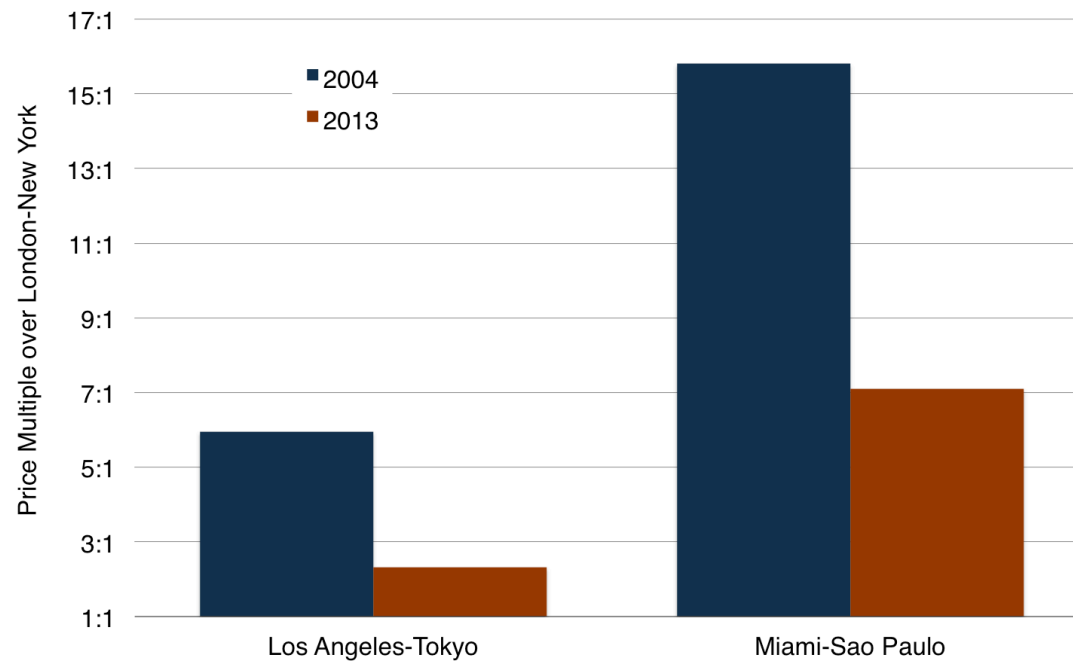
Are Transport Prices Falling? [Yep.]

Monthly 10 Gbps Wavelength Lease Price, 2004-2013



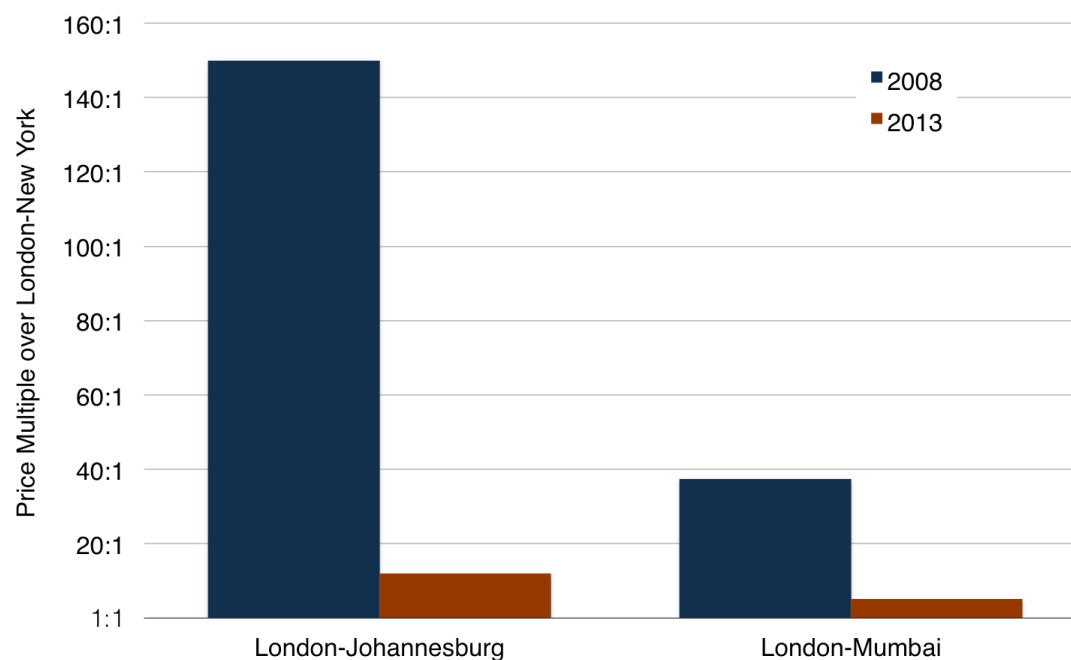
Regional Price Differences Narrow

10 Gbps Wavelength Price Multiples over London-New York



What About Convergence Elsewhere?

10 Gbps Wavelength Price Multiples over London-New York



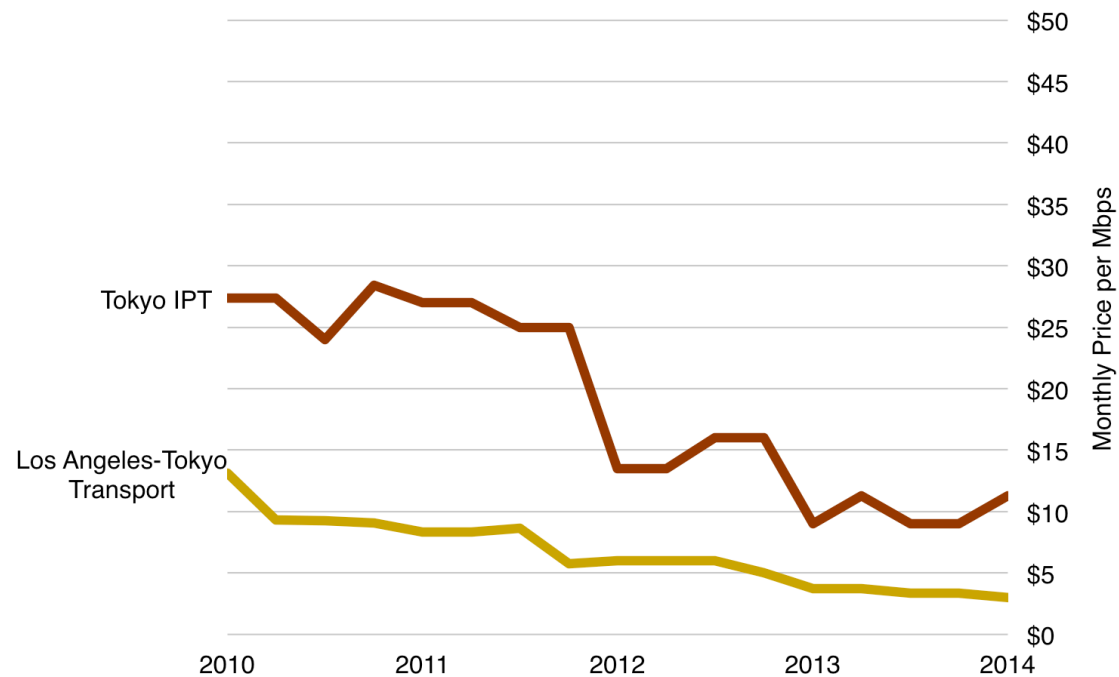
Let's Not Get Carried Away

Median 10 Gbps Wavelength Prices per Month, Q4 2013

Route	Price
London-New York	~ \$7k
Los Angeles-Tokyo	~ \$18k
Miami-Sao Paulo	~ \$55k
London-Mumbai	~ \$105k
London-Johannesburg	~ \$250k

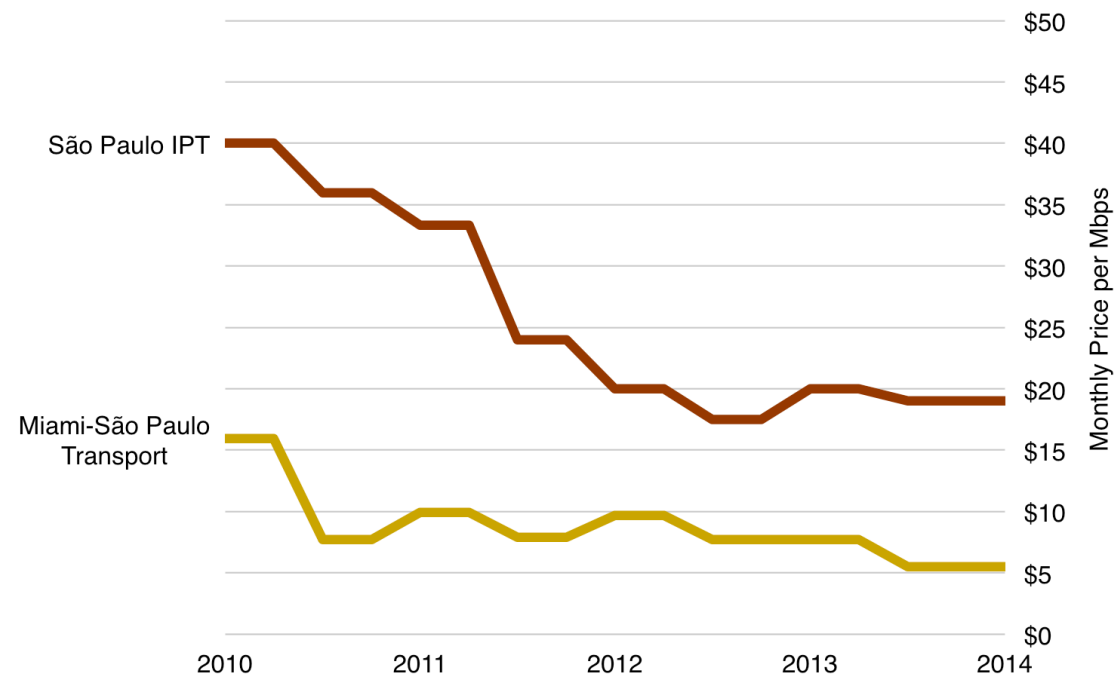
IPT vs. Transport Prices: Asia

Monthly Price per Mbps for 10GigE Port and 10 Gbps Wavelength



IPT vs. Transport Prices: Americas

Monthly Price per Mbps for 10GigE Port and 10 Gbps Wavelength

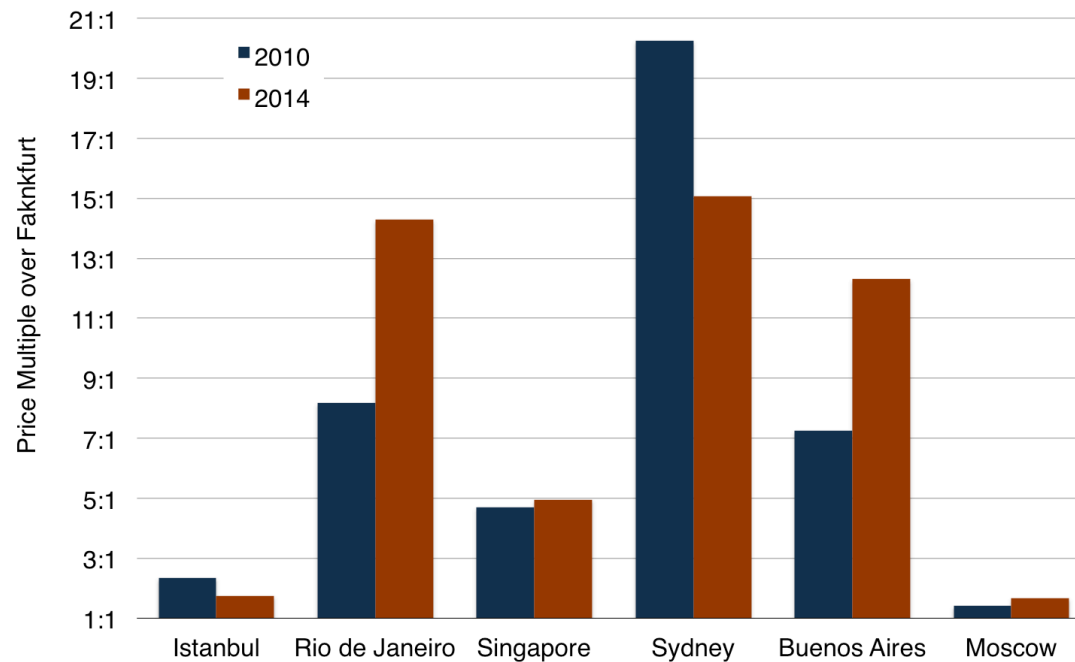


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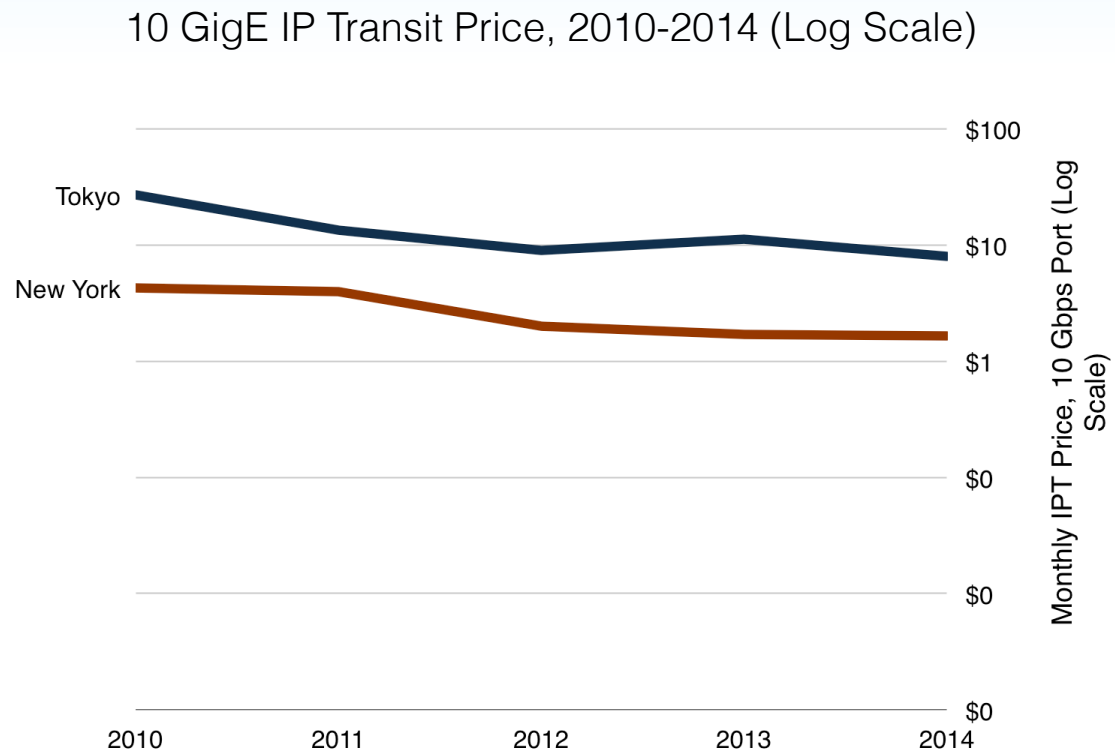
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Singularity in Sight?.... Not Exactly

10 GigE IP Transit Price Multiples Frankfurt

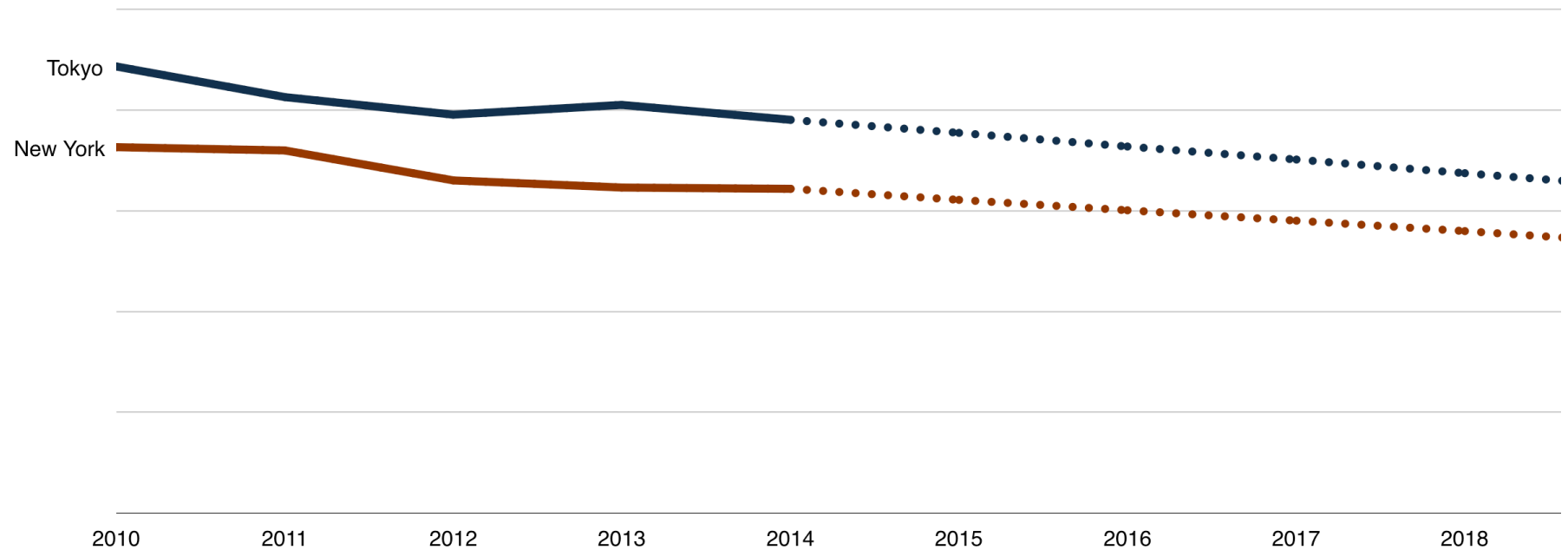


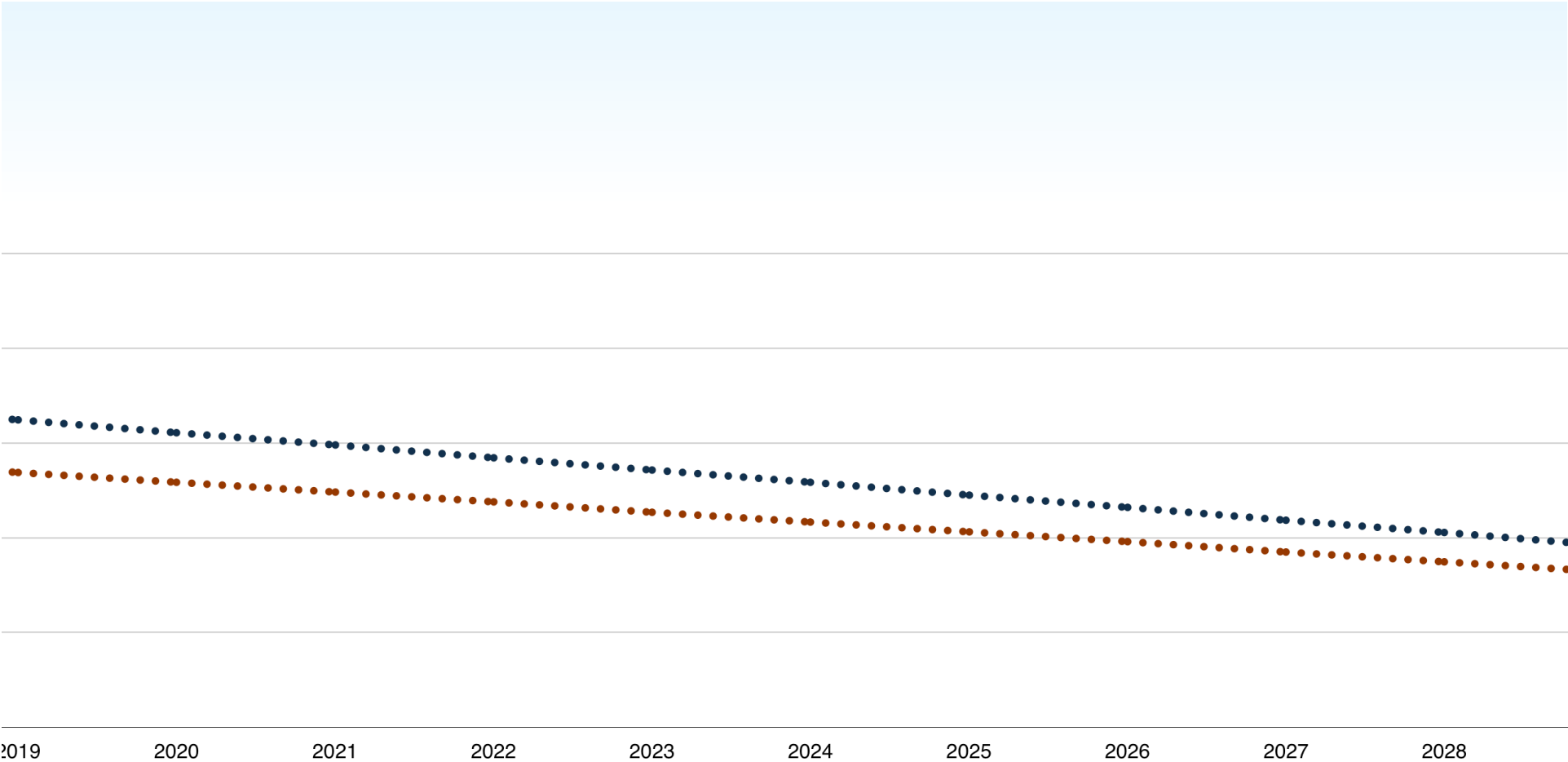
IPT Convergence (or Lack Thereof)

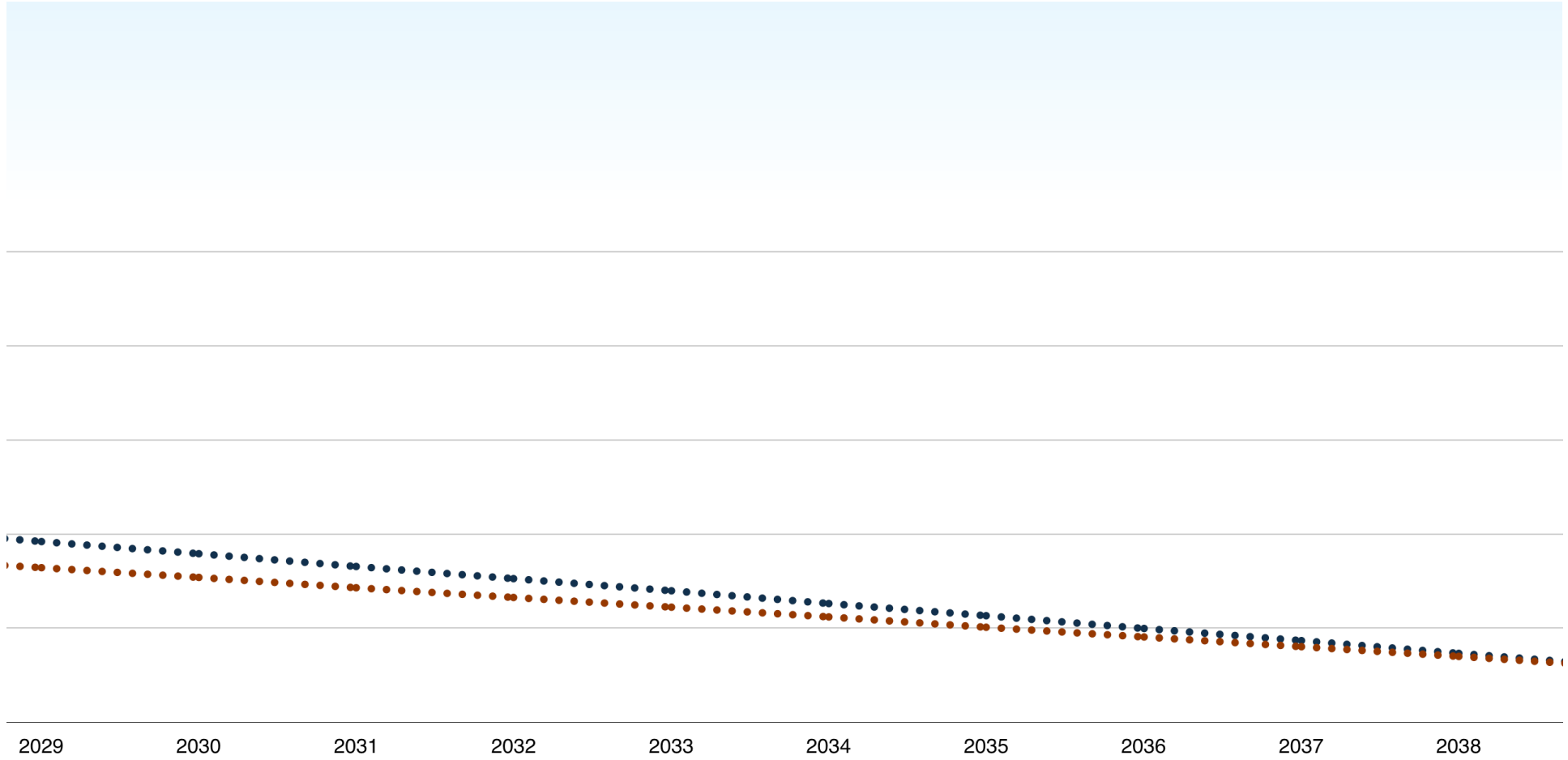


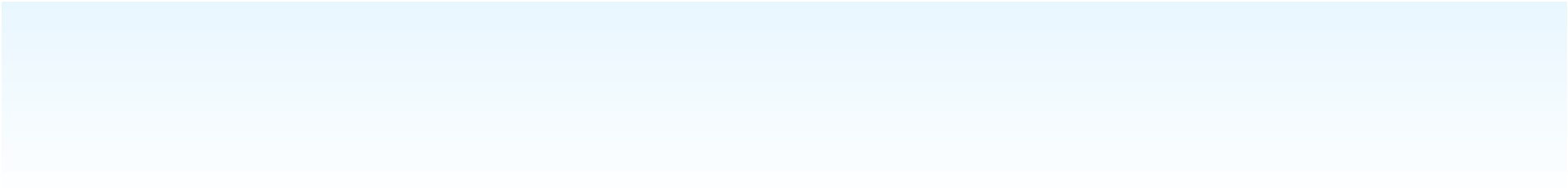
How Long till Price Convergence?

[For Fun] What Happens if We Apply 2010-2014 CAGR to Future Years?









2039

What Factors Prevent IPT Price Convergence?

- IPT prices often reflect the cost of transport to a hub country
 - Higher transport prices → higher IPT prices
- Lack of IP backbone provider competition
 - IPT providers offering low-price service do not exist in each city
- Unfavorable regulatory environments
- Expensive backhaul/cross-connects

Conclusions

- Lots of new cables, capacity on their way
 - Some built for “stupid” reasons (e.g., national pride)
 - Most built for solid corporate reasons (e.g., carriers/ISP/content providers building to handle internal traffic)
- Prices faster falling as a result
 - IPT price declines roughly match transport price declines
 - Prices falling everywhere, but we are *not* moving to a single, universal price

A Quote to Inspire

MataHmeH maSachnIS.

—Ancient Klingon Proverb

“To survive, we must expand.”

Thanks for Listening

Tim Stronge

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