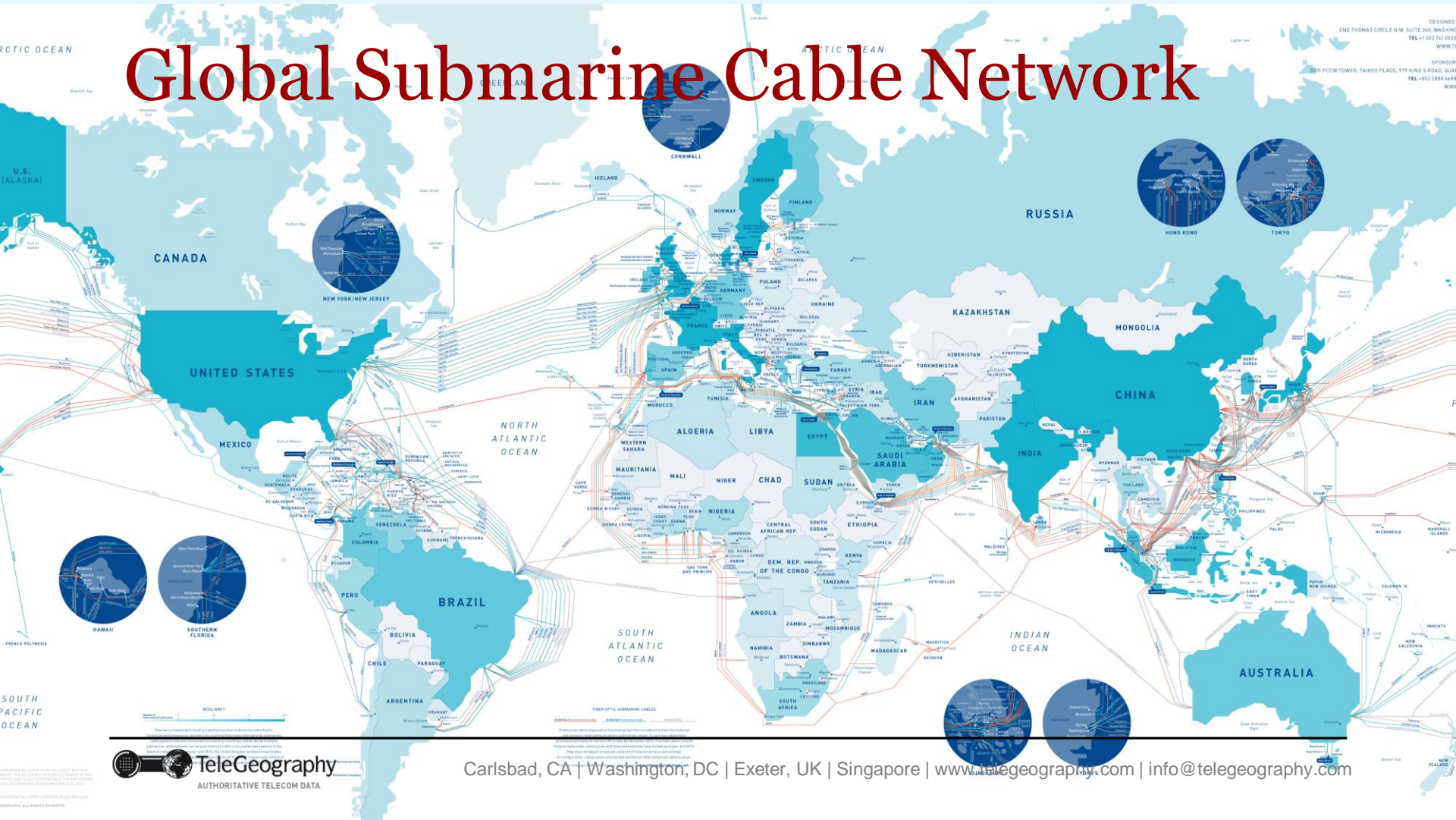


Global Submarine Cable Network



Carriers Exchanging Traffic

Colocation Floor Space

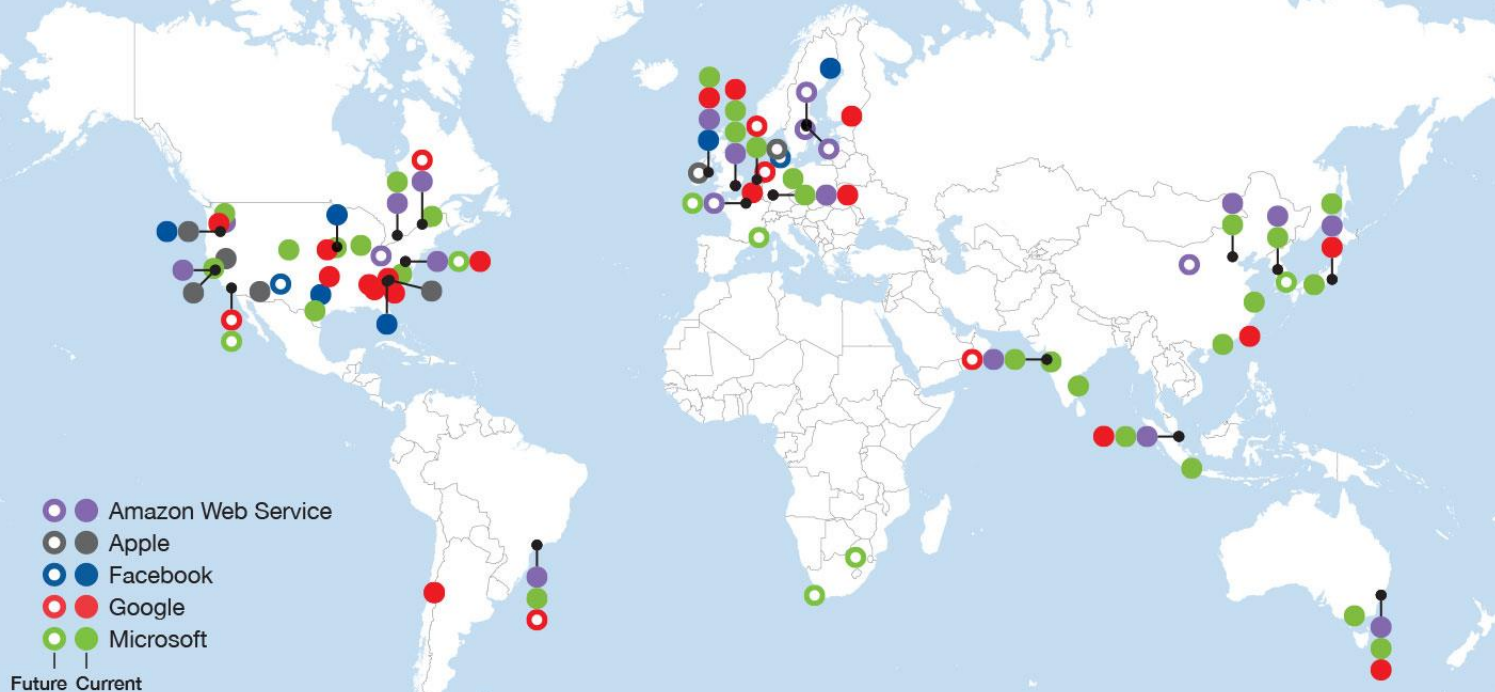
Gross Floor Space
(million sq ft)

4

0.5



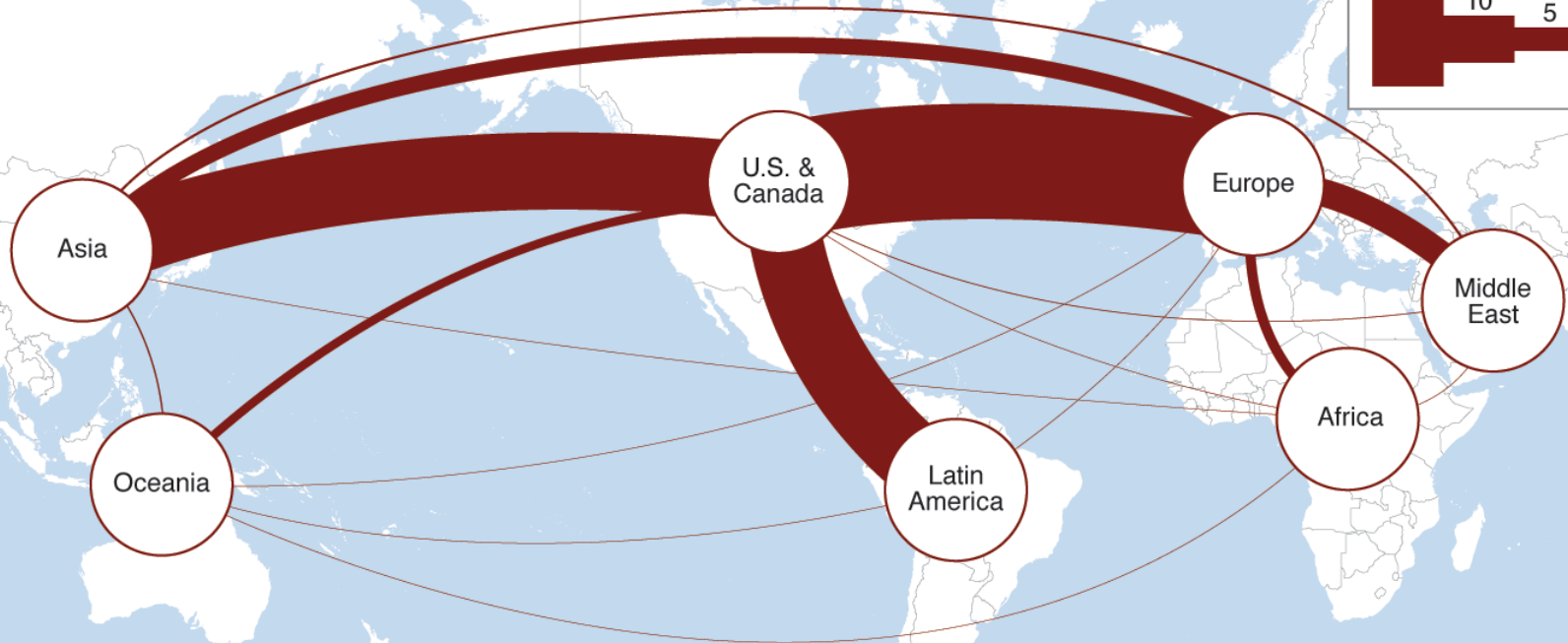
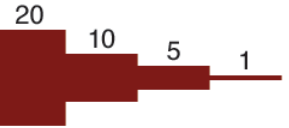
Linking Content and Applications



Major Content Provider Data Center Locations, 2017

Aggregate Global Bandwidth

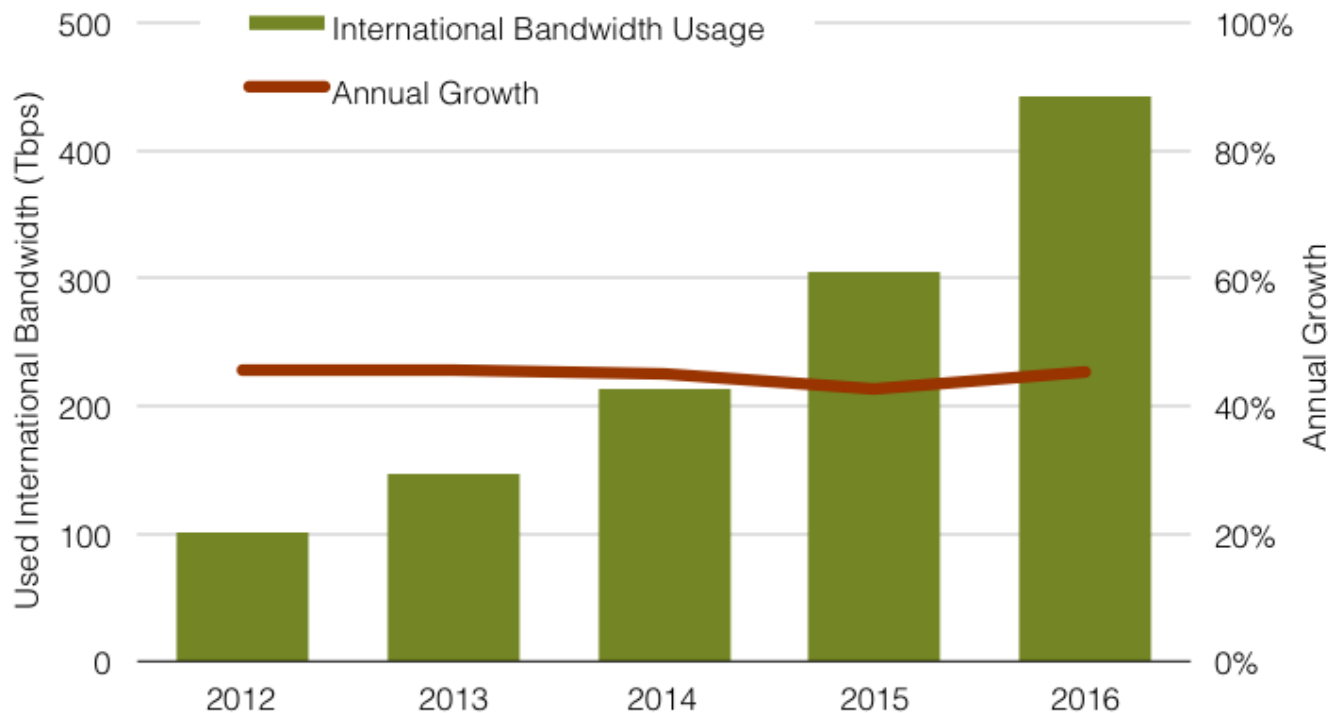
Used Inter-Regional
Bandwidth (Tbps)



- Linking global hubs and users to hubs
- Favorable space, power, connectivity, population, business climate, etc.

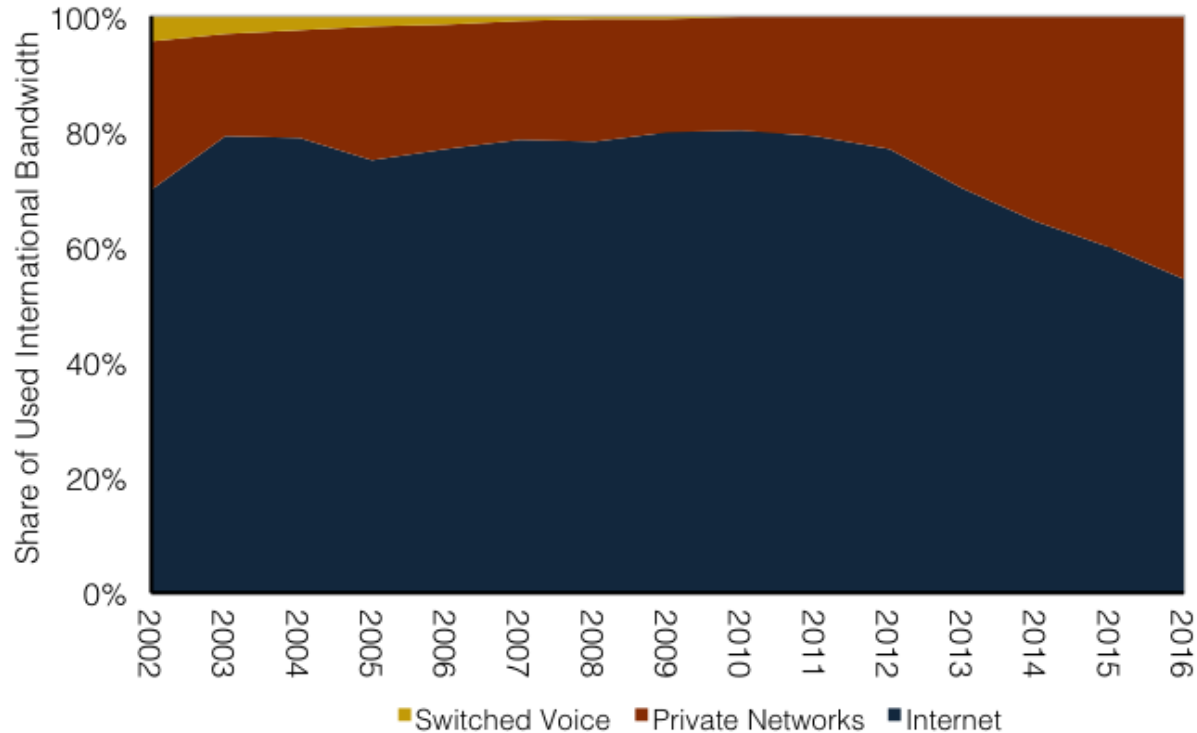
Aggregate Demand Growth “Flat”

Used International Bandwidth Growth, 2012-16



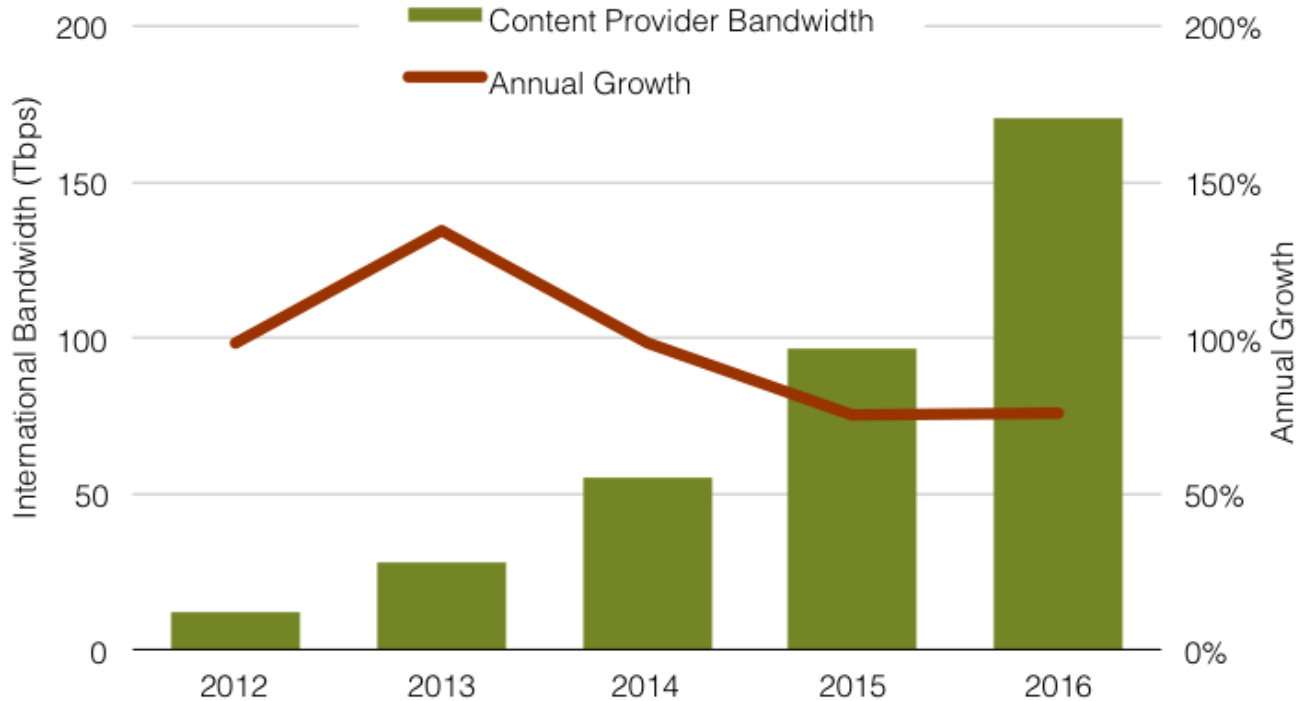
Private Networks Gaining Share

International Internet, Private Network, & Switched Voice Capacity, 2002-16



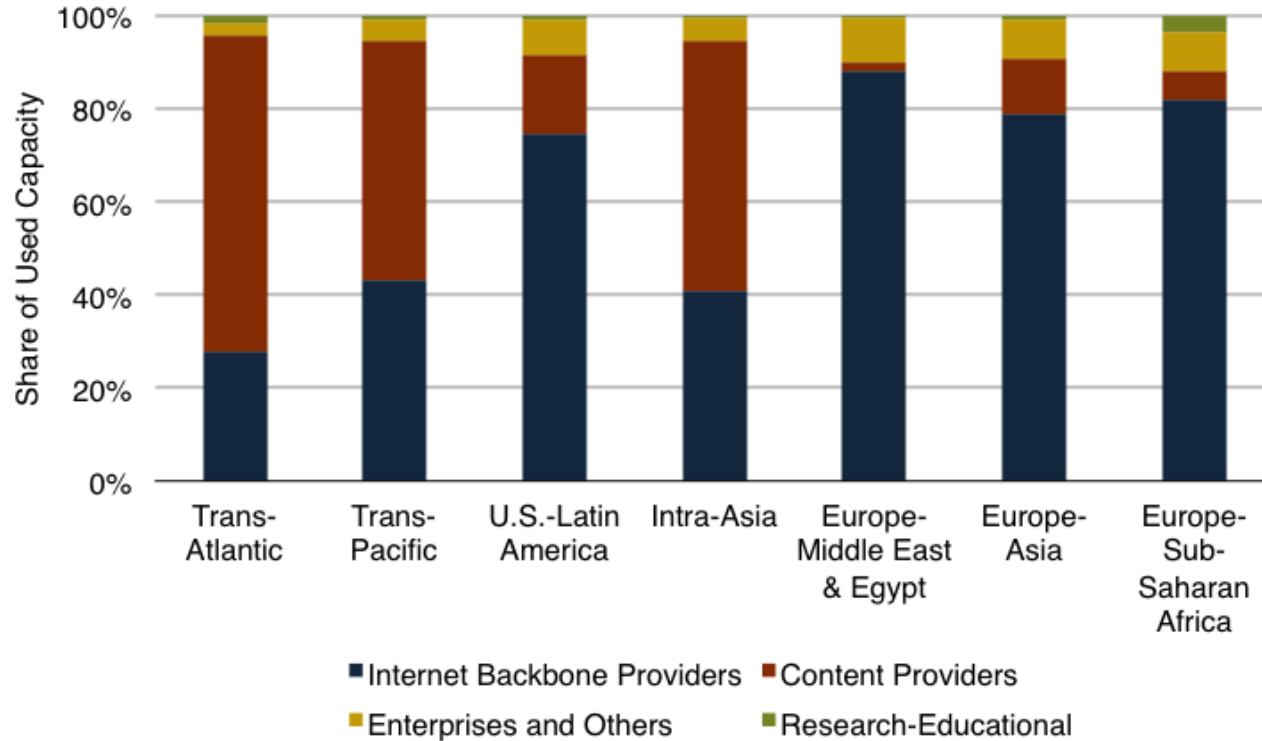
Content Provider Growth

International Bandwidth Growth, 2012-2016

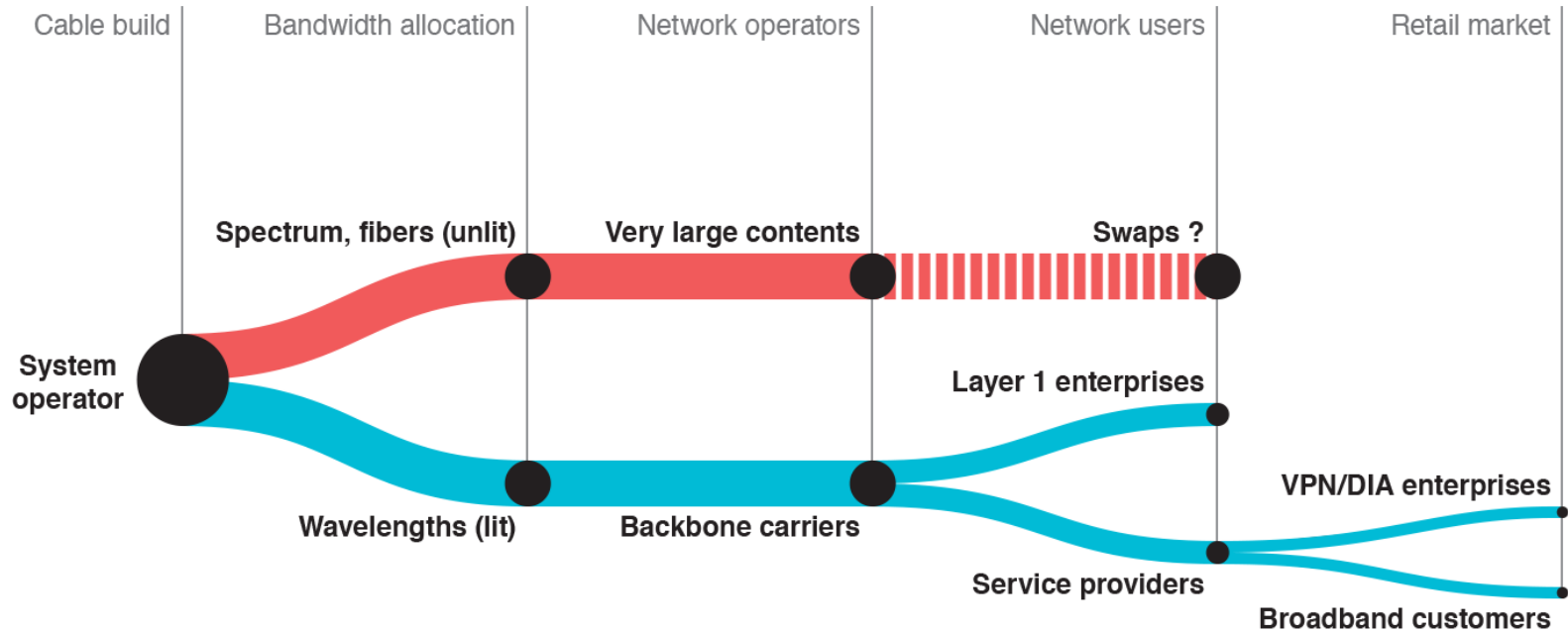


Private Network Share Varies by Route

Private Network Bandwidth Share by Route, 2016



Cable Bandwidth Distribution



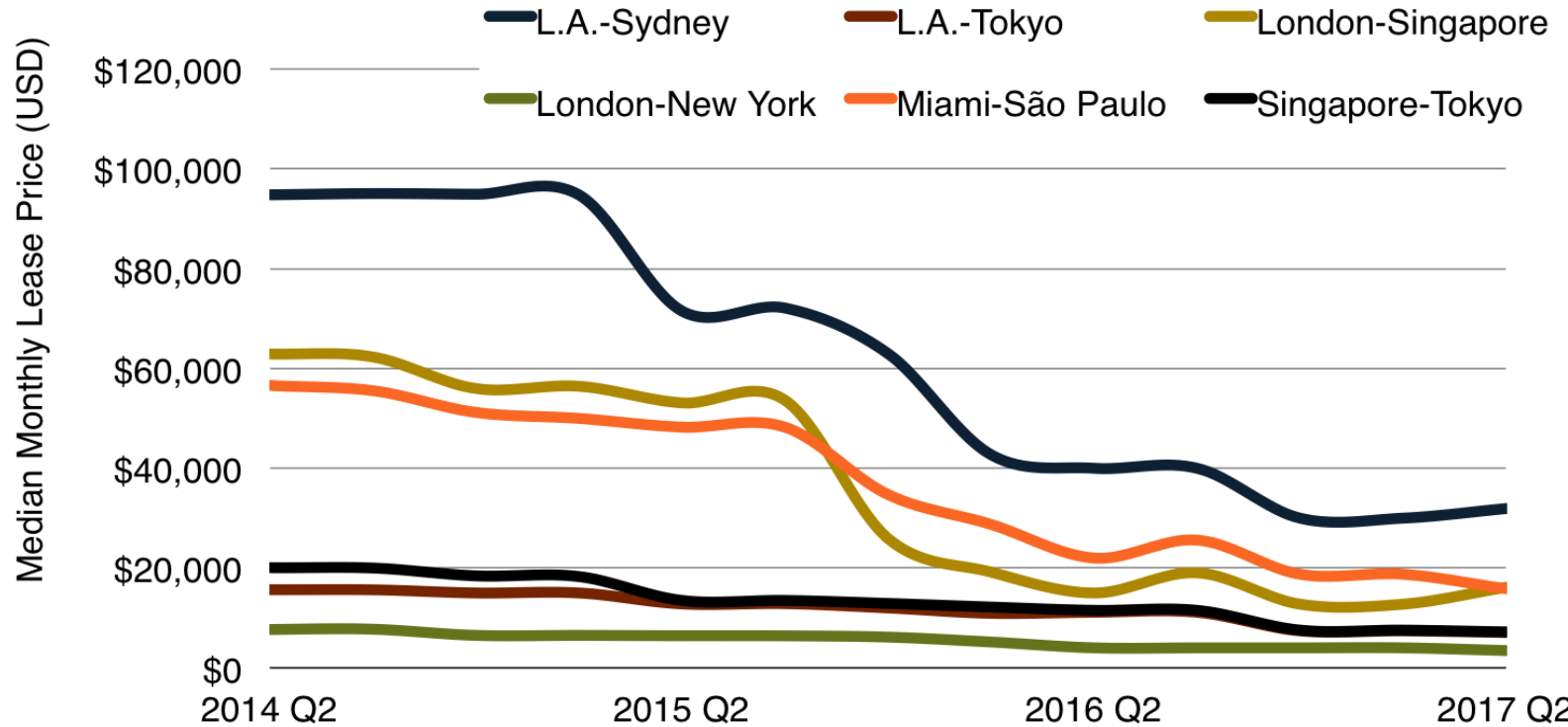
Prices Vary by Geography

10G Wavelength MRC, 10G IPT Port MRC.



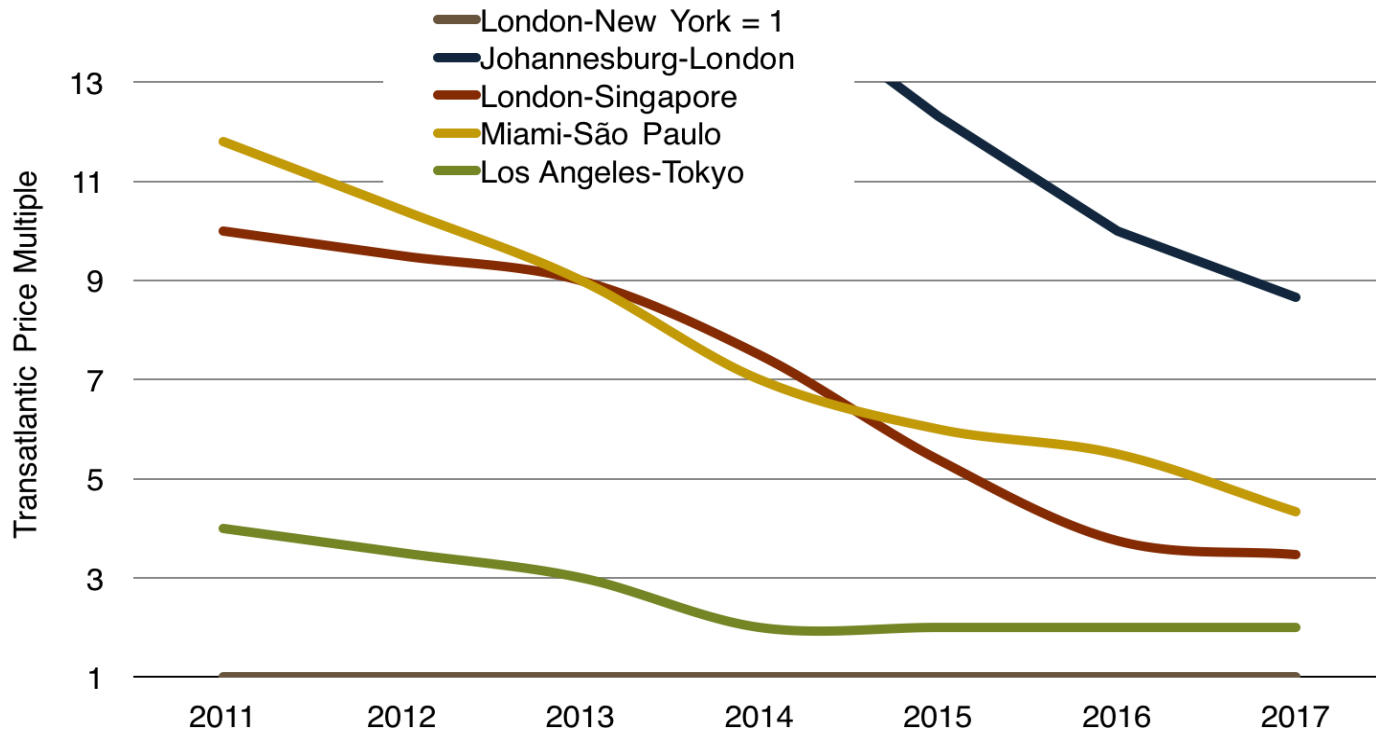
Transport Prices Decline

Weighted Median 10 Gbps Wavelength Monthly Lease Prices, 2014-17



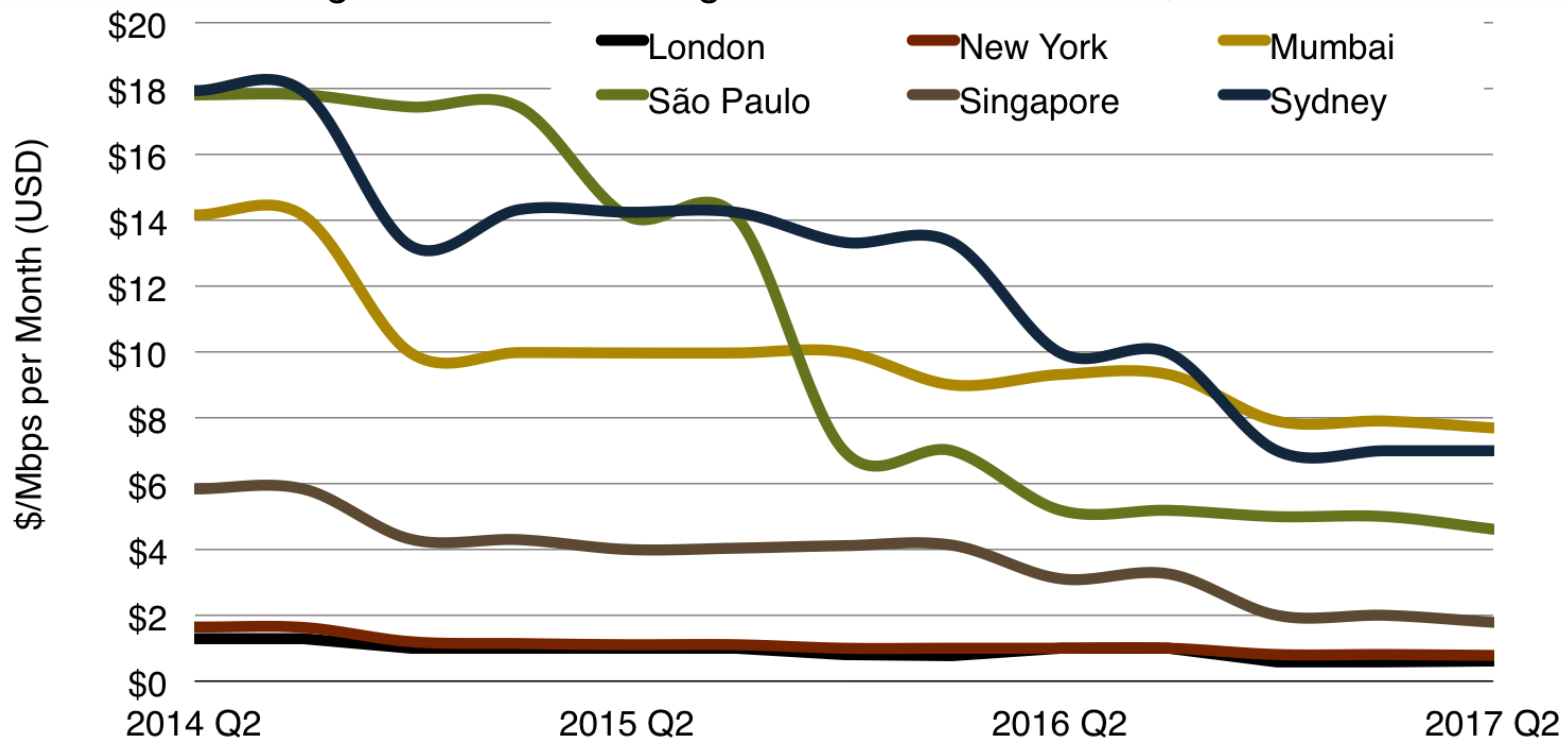
And Are Converging Globally

Price Relative to London-New York, 2011-2017



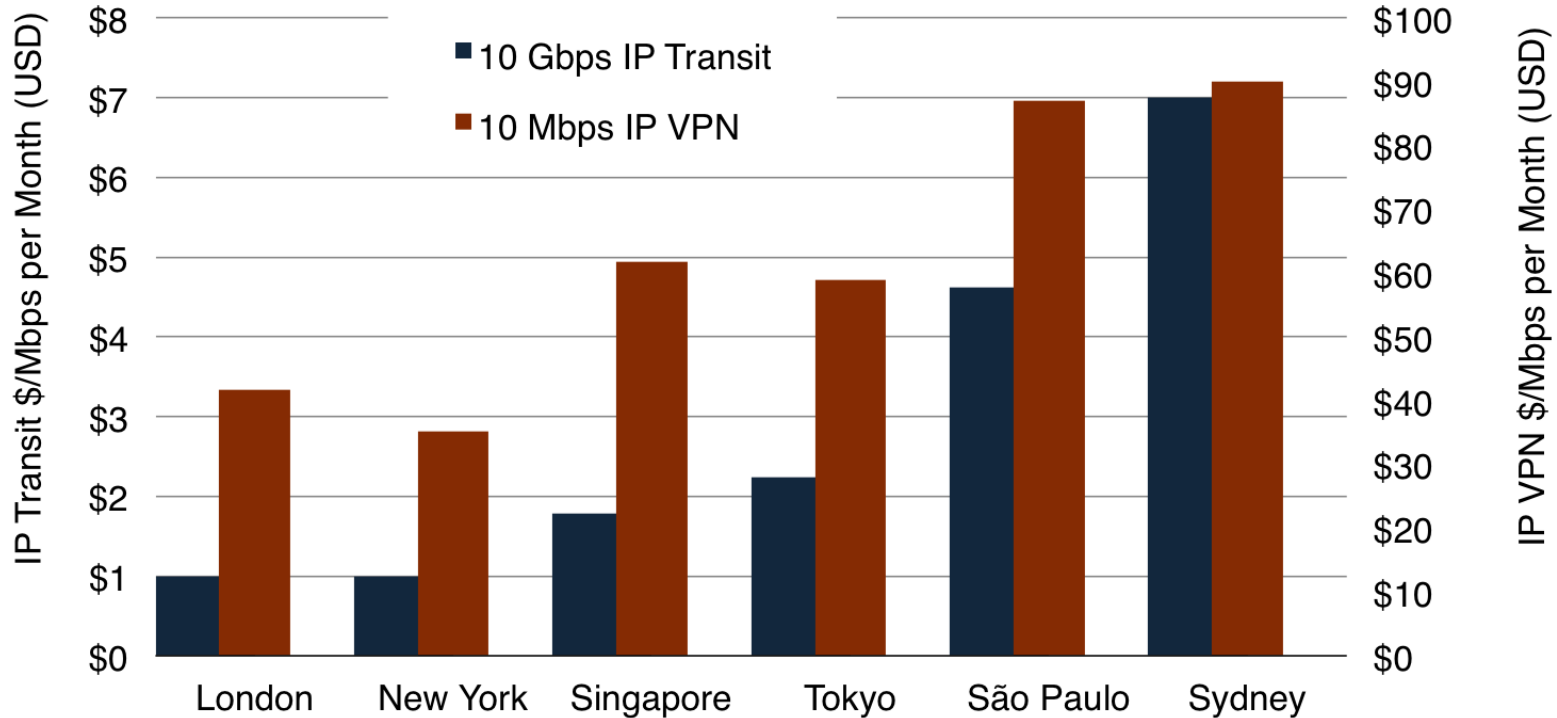
Transit Prices Follow

Weighted Median 10 GigE IP Transit Port Prices, 2014-17

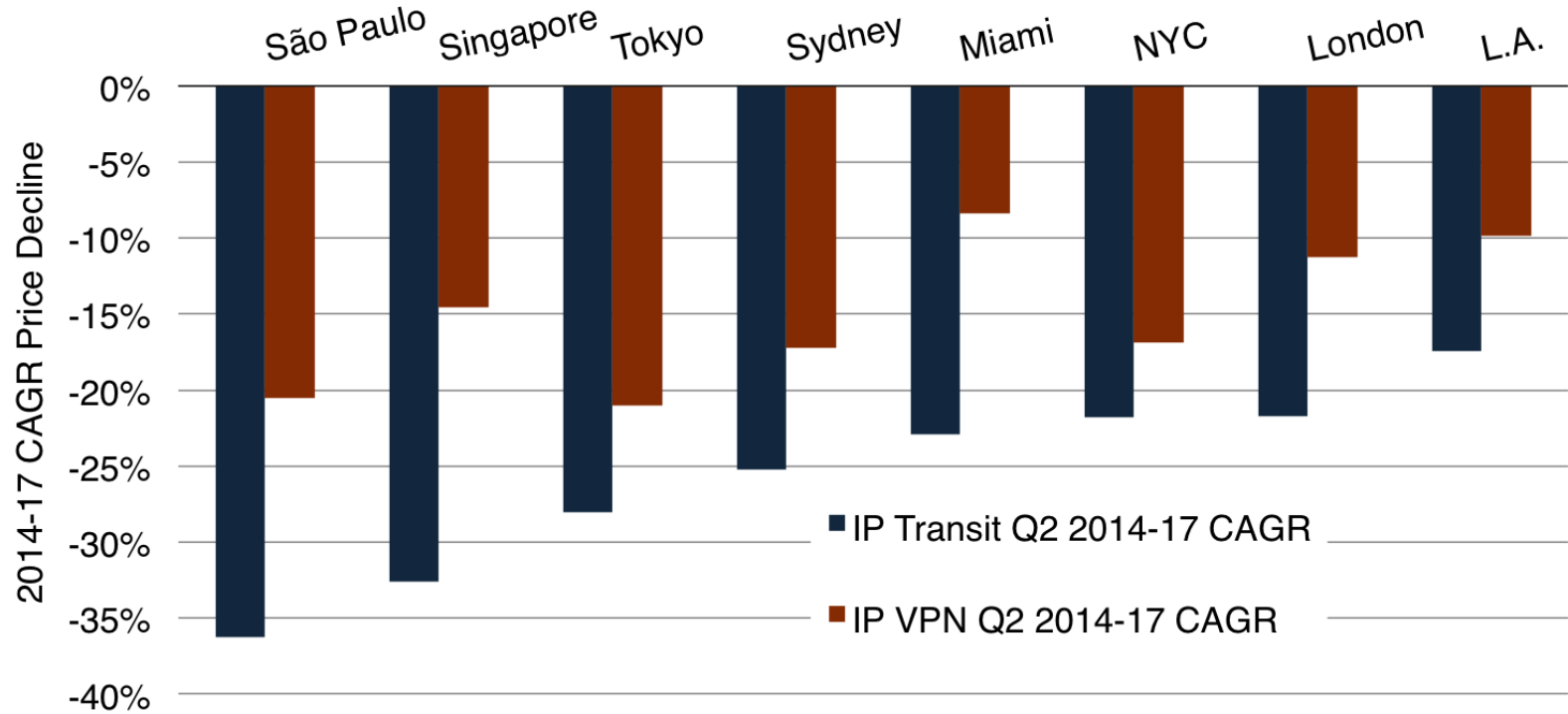


Enterprise Prices Map to Wholesale

Median 10 GigE IP Transit & 10 Mbps IP VPN Port Prices, 2017

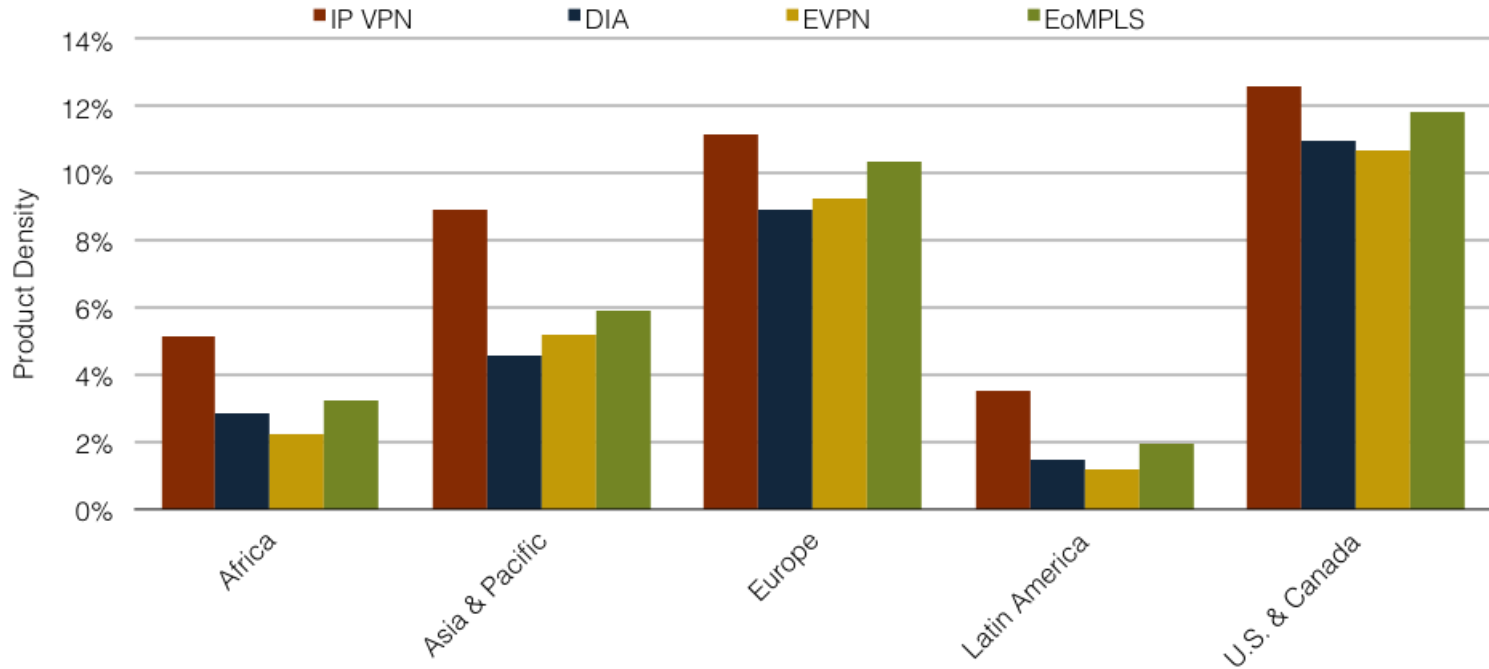


...and Exhibit Similar Trends



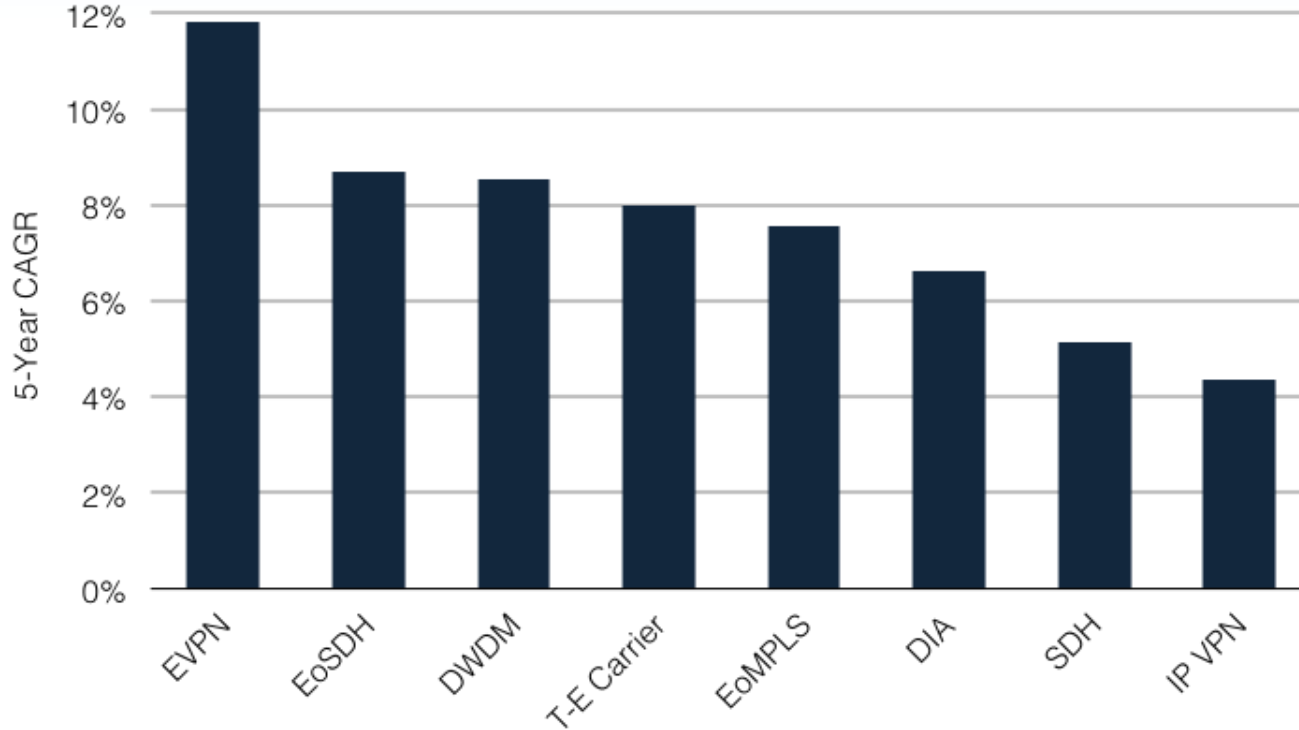
Product Density by Region

IP VPN, DIA, EVPN, EoMPLS density in key global business markets 2016



Growth in Product Offerings

Global CAGR of Product Offerings in Key Global Markets, 2011-16

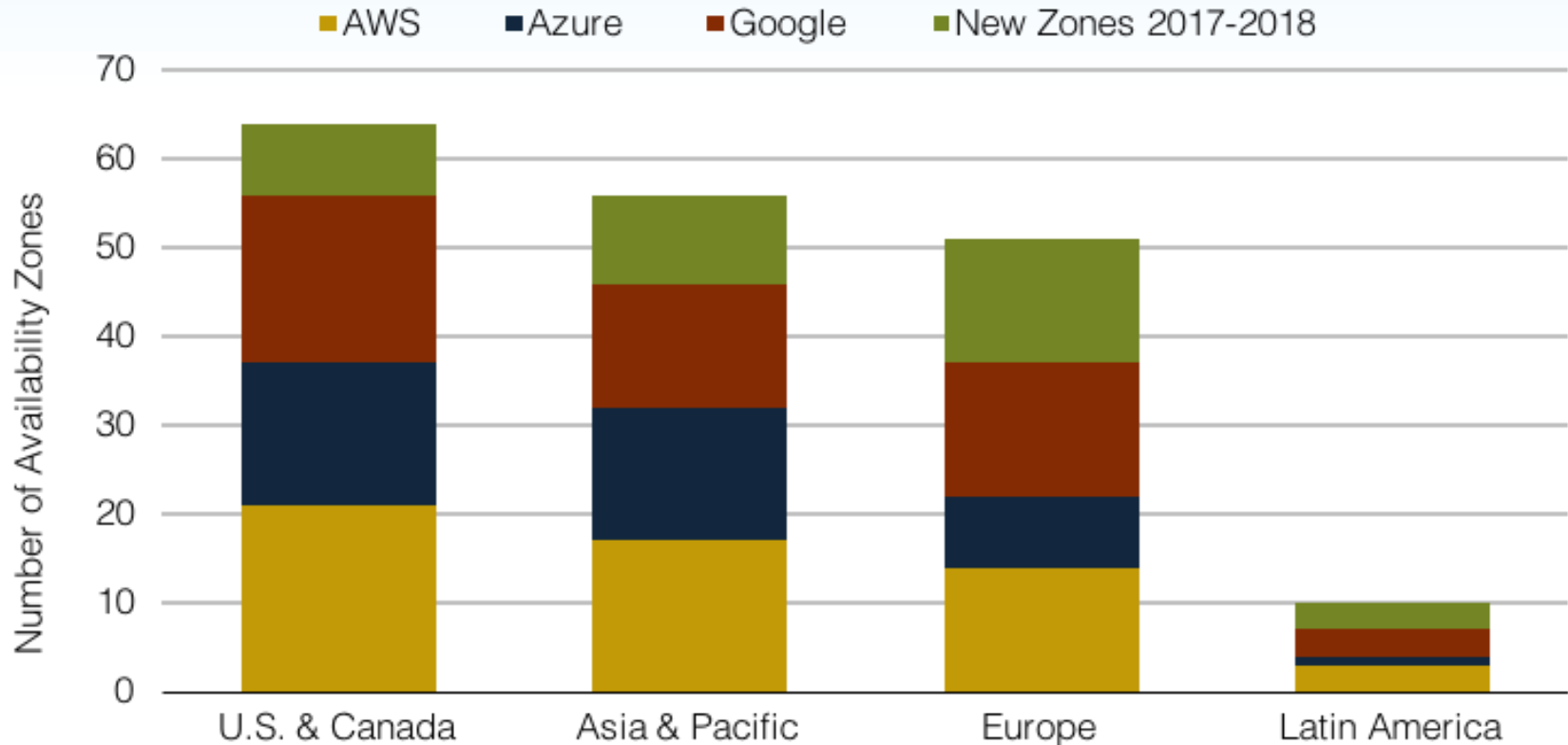


Cloud Data Centers & Direct Connects

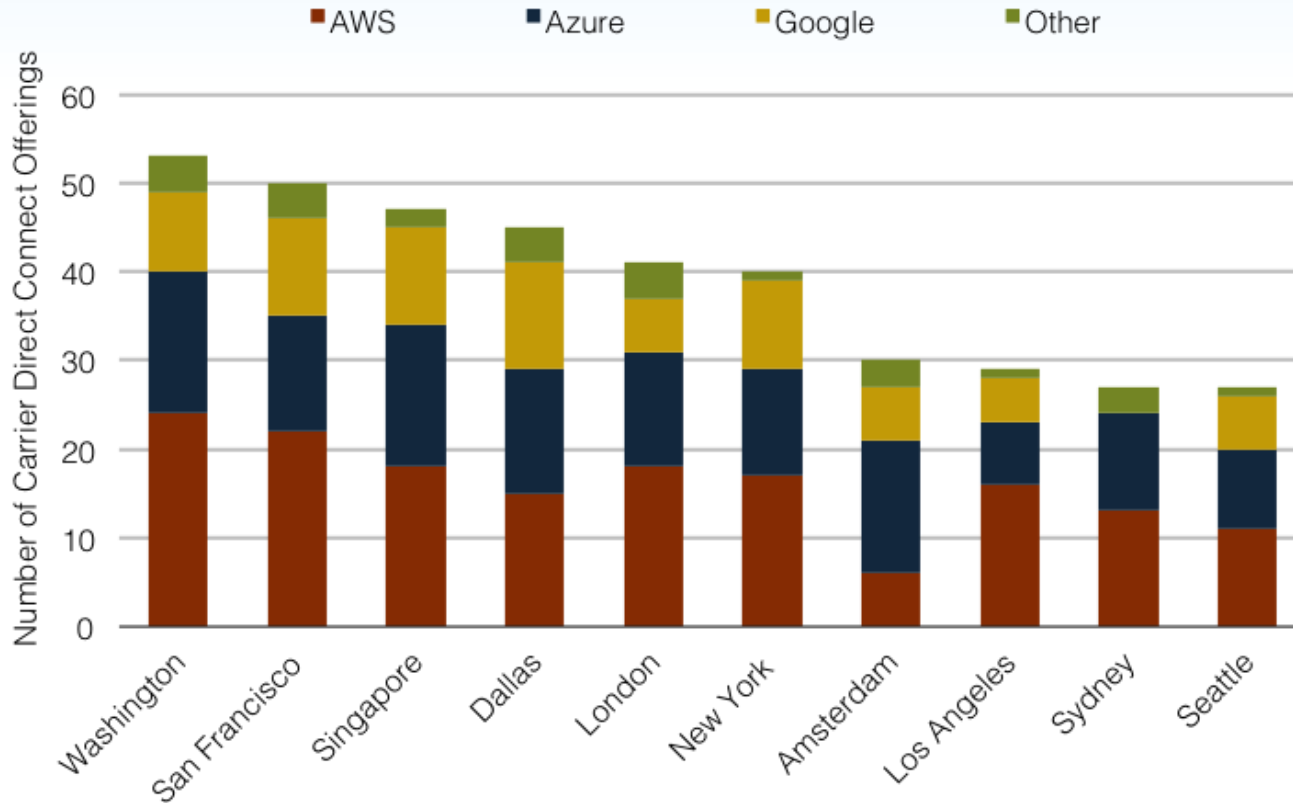


● Direct Connect ● Data Centers ● Existing Data Centers, with 2017 buildouts

Cloud Provider Zones & Regions

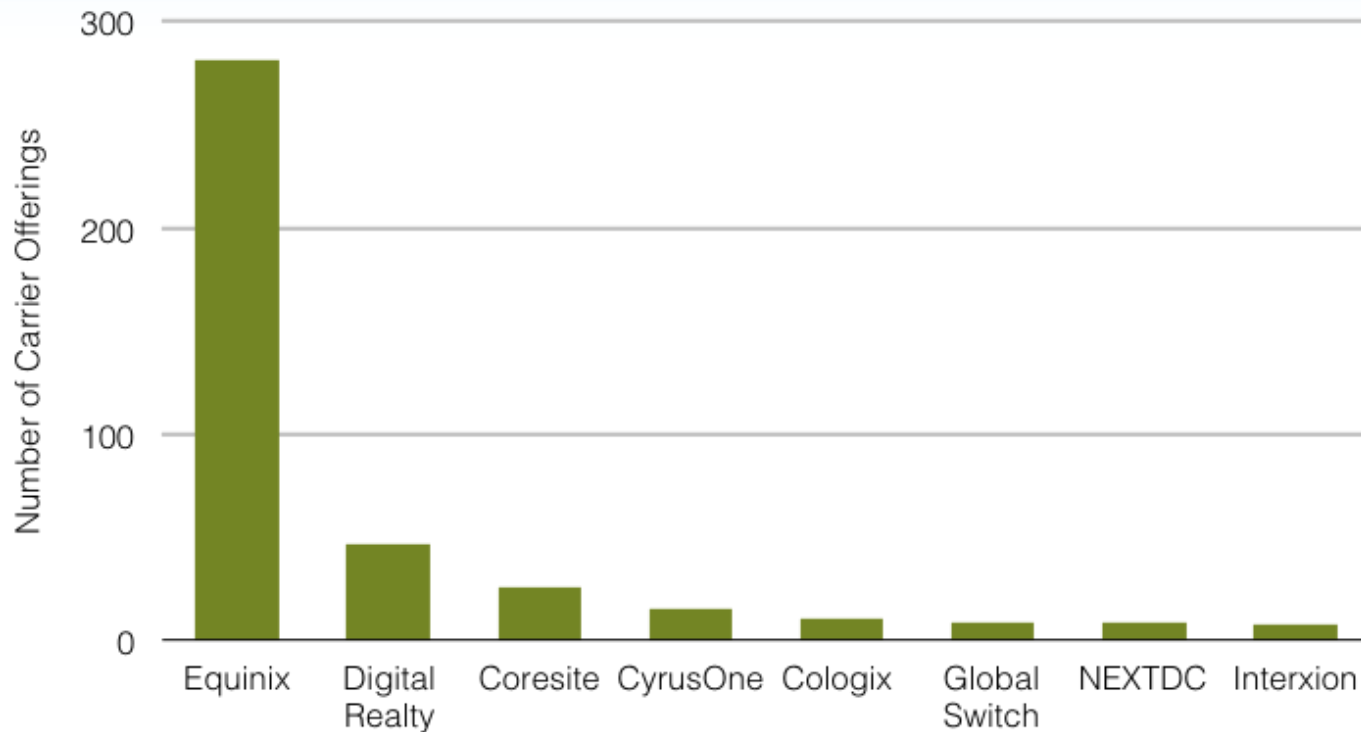


Direct Connect Offerings by City



Colo Facilities Connecting WANs to the Cloud

Total Carrier Direct Connect Offerings to Cloud Providers, 2016



Summary

- Global network of primary hubs
- Demand growth is as reliable as price erosion
- Enterprise WAN costs predicated on wholesale prices
- Content Provider growing faster than the internet
- Cloud Direct Connects are highly available in certain markets

Thank You!

Questions?

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