

CARRIER SERVICES AND THE LOW LATENCY MARKET

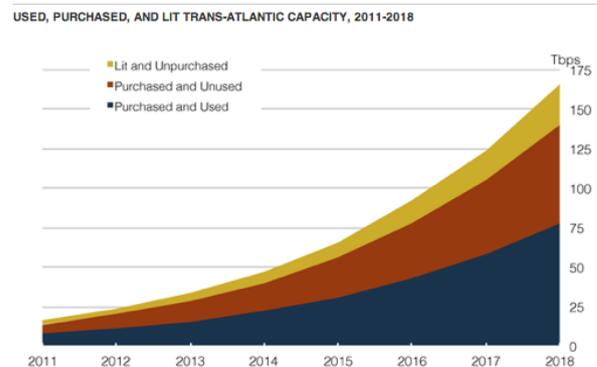
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Abstract: This paper will take a deeper look at the demand for low latency systems, as well as current and future drivers. The paper will also discuss performance measurement and management as a priority for low latency services.

1. CARRIER SERVICES AND THE LOW LATENCY MARKET

Millions of people across the world wake up each morning and check their smartphone or iPad for the latest email and news. In our 'always-connected' world, and as Internet enabled devices become a part of morning routines, it is no surprise that international bandwidth demand continues to increase. According to TeleGeography, bandwidth demand grew 45% in 2011. This percentage of expansion has operators across the globe upgrading existing network infrastructure and investing in new cable construction to stay on pace. TeleGeography forecasts that \$5.5 billion (USD) of new submarine cables will come into service during 2012 and 2013 with the transatlantic remaining the largest submarine cable route, with 16.2 Tbps of lit capacity as of 2011^[1].

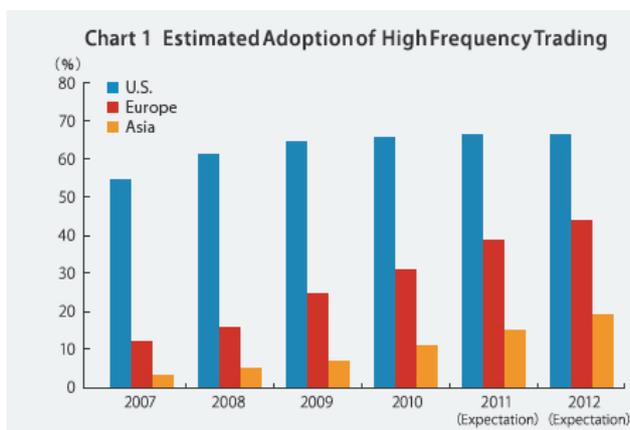


[2] Graph 1: Used, Purchased and Lit Trans-Atlantic Capacity, Forecast for 2011-2018

2. DEMAND FOR LOW LATENCY ACROSS THE ATLANTIC

One of the key drivers that make the transatlantic one of the most sought-after submarine cable routes, are the financial exchanges, data centers and financial services firms it connects, including high capacity routes linking U.S. and Canada to Europe and other key markets. And with these financial hubs crossing the transatlantic comes demand for low latency. Low Latency requirements from financial institutes in London, Chicago and New York, for instance, push the boundaries of the networks that exist today. In order to remain competitive, operators must upgrade and improve the

amount of capacity their cables can handle. The ability to shave milliseconds off a route is a game changer in the financial world. Algorithmic and High Frequency trading is on the rise and fueled by the ability to know the rate of a transaction before a competitor. Therefore, operators have the ability to elevate themselves, gaining significant profits when they are able to leverage this advantage.



[3] Graph 2: Estimated Adoption of High Frequency Trading

3. FUTURE LOW LATENCY DRIVEN TRENDS

In addition to the financial industry impacting low latency, the multimedia sector is also looking to engage this technology. Content delivery networks and media companies require high capacity, low latency networks to ensure seamless transmission from broadcasting centers all the way to viewers' high definition TVs. As such, High Definition transport programming for sporting and live events is another demand driver for utilizing low latency services.

International sporting events and online gaming are also driving media companies to connect to low latency networks. With ultra-low round trip delay (RTD) being a priority for the online gaming community, more and more companies are evaluating latency in addition to resiliency in the

networks they chose.

As you can see there are multiple market segments vying to adopt low latency technology within their infrastructures, in order to gain competitive advantages. It's no wonder that recently there have been new subsea cable activity and high capacity projects to beef up capacity across the Atlantic. Most of the transatlantic systems have been in existence for more than several decades and technology for electronics, fiber and equipment has improved to allow new subsea cable systems to leverage low latency to the fullest. This is definitely a region to watch in the years ahead.

4. LOW LATENCY PERFORMANCE MEASURES AND MANAGEMENT

The measurement and management of network performance is crucial with latency ranking amongst the highest of customer priorities across industries, such as finance and gaming. The measurement of latency can be quite challenging though due to inconsistency in methodologies. It is critical that vendors take market traffic between key financial exchanges into consideration when testing. Latency quotes that are provided without these considerations are of little use to those within the financial industry, particularly algorithmic traders.

Ultimately the performance of global trading systems depends on the structure upon which they operate. Failure to meet latency requirements can lead to major revenue loss for customers. As such, Quality of Service levels ensuring reliability and latency are of the utmost importance and begin with the proper measurement and management of the network.

5. REFERENCES

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