November 9, 2018

Brent J. Fields
Secretary, Securities and Exchange Commission
100 F St., NE
Washington, DC 20549

RE: File No. 4-729: Roundtable on Market Data and Market Access

Dear Secretary Fields:

Wolverine Execution Services, LLC (WEX), Wolverine Securities, LLC (WS), Wolverine Trading, LLC (WT), and Wolverine Trading Technologies, LLC (WTT) (together "Wolverine") appreciates the SEC organizing the "Roundtable on Market Data and Market Access" held on October 25 and 26, 2018 and welcomes the opportunity to provide written commentary on these important issues.

WEX technology routes options orders placed by many retail investors, which is customized for each client to provide best execution, optimizing for transaction fees, price improvement, or any combination of these and other factors as per each client's request. WS provides similar routing services for the US equity markets, which similarly require us to provide best execution for our customers.

We applaud the SEC's review of all fees, including colocation, ports, and market data access fees in order to comply with 15.2B.78f.b.4 and 15.2B.78f.b.8 of the Exchange Act, requiring:

"The rules of the exchange provide for the equitable allocation of reasonable dues, fees, and other charges among its members and issuers and other persons using its facilities." and "The rules of the exchange do not impose any burden on competition not necessary or appropriate ..."

Several exchanges have argued that choice and competition exist today. Wolverine disagrees. There is **no other way** to obtain the **lowest** latency data other than through exchange provided colocation, ports, and market data feeds. Each exchange has a monopoly on their ports and market data (and colocation in some cases), and due to their own abusive pricing of their monopoly services, they require more stringent regulatory oversight as their fees are not reasonable.

Physical Port Discrimination

15.2B.78f.b.5 of the Exchange Act demands: "The rules of the exchange … are not designed to permit unfair discrimination between customers, issuers, brokers, or dealers."

Several exchanges (NYSE LCN, Nasdaq Ultra, MIAX ULL) continue to discriminate by offering multiple 10Gb port services, with one explicitly being faster than the other for a non-equitable monetary premium. We argue offering multiple classes of 10Gb ports, with the only difference being higher cost for lower latency, is a violation of the Exchange Act and needs to be prohibited.

We applaud IEX, BOX, BATS, and CBOE in **not** offering discriminatory classes of 10G ports.

Physical Port Fees

Choice and competition exist today in the cloud computing industry. Amazon, Google, and Microsoft are the top 3 public cloud providers[1], and there are many other additional companies competing fiercely. Dedicated 10Gb ports are sold by each cloud provider, similar to exchanges. However, unlike exchanges, access to these public cloud providers is **free** over the internet and does **not** require the purchase of a physical port. The cloud business is so competitive that even third parties[2] are providing direct ports to multiple cloud providers at a low cost ($210/month for a 10Gb port). True competition and choice exist, and so, we recommend the SEC use the cloud computing industry as a benchmark to assess if exchange physical port fees are **reasonable.** Below is a table, comparing the cost of one 10Gb port.

Monthly Port Fees	Amazon AWS[3]	Google Cloud[4]	Microsoft Azure[5]	NYSE LCN LX[6]	Nasdaq Ultra[7]
10Gb Port	$1,620	$1,700	$2,500	$22,000	$15,000

NYSE and Nasdaq charge **1358%** and **926%** more than Amazon AWS for a 10Gb port, which is clearly unreasonable. Wolverine proposes that a reasonable fee is the average of the three public cloud providers above, limiting an exchange's 10Gb port fees to **$1940/month.** Even this is substantially above the $324/month[8] IEX estimates as its cost.

Wolverine requests the Commission review NYSE's $15,000 LCN port install fee for being unreasonable and inequitable. From our estimation, a single install fee will nearly pay for an entire network switch that can serve **48** 10Gb ports. In comparison, Nasdaq charges $1,500 for an install fee and BATS and IEX charge zero. Our understanding is that none of Google, Microsoft, and Amazon charge a port install fee.

Market Data Access Fees

Wolverine is unable to find a similar, competitive industry to use as a benchmark for market data fees. Using bandwidth for fee billing (as cloud computing does) makes no sense as every exchange disseminates its market data using multicast technology. Because there is no additional marginal cost for an exchange to deliver a multicast packet to one versus fifteen customers, exchanges enjoy an economy of scale that cloud providers do not.

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1 Top 3 by public cloud enterprise adoption: https://www.zdnet.com/article/cloud-providers-ranking-2018-how-aws-microsoft-google-cloud-platform-ibm-cloud-oracle-alibaba-stack/
2 https://www.equinix.com/services/interconnection-connectivity/cloud-exchange/
3 10G AWS Direct Connect: 2.25/hour * 24 hours * 30 days = $1620: https://aws.amazon.com/directconnect/pricing/
4 10G Dedicated Interconnect: https://cloud.google.com/interconnect/pricing
5 Azure ExpressRoute: $5000/2 = $2500 (ExpressRoute requires two 10G ports): https://azure.microsoft.com/en-us/pricing/details/expressroute/
6 NYSE LCN p27: https://www.nyse.com/publicdocs/nyse/markets/nyse/NYSE_Price_List.pdf
7 Nasdaq 10Gb Ultra: https://www.nasdaqtrader.com/Trader.aspx?id=PriceListTrading2#phconnectivity
8 Annual cost per port $3893/12 = $324: https://medium.com/boxes-and-lines/shakedown-in-new-jersey-the-hidden-cost-of-exchange-connectivity-93ebb57187b0

The Commission has heard repeatedly from firms like ours that in order to provide best execution to our customers, as required by SEC rule, we are commercially obligated to subscribe to the lowest latency feeds. We appreciate the larger discussion being held around possible SIP changes, but postulate such changes will likely take many years to come to fruition.

To solve the immediate problem we have today, we agree with the many round table participants that have proposed exchanges be required to be transparent with their costs for providing these market data services, which will reveal their huge margins for providing this monopoly service. We agree that the Commission should continue to enjoin, suspend or abrogate fees that lack transparent cost data as the only practical means of incentivizing monopoly providers of said data to comply with the Commissions' order and with the requirements of the Exchange Act.

True Competition

WEX runs an options smart order router platform that competes for options order flow with multiple other similar platforms. WEX does not charge any port fees (zero) nor any access or bandwidth fees (zero). Clearly, the exchanges do not feel a similar competitive constraint.

Closing Remarks

We appreciate the SEC taking a large scale review of these important topics affecting our industry. Any competitive equity or options firm requires equal latency access to market data at a **reasonable** cost, as required by the Exchange Act. Furthermore, the current levels of colocation, port, and market data fees **discriminate** against smaller firms and are clearly **inequitable**. Furthermore, these costs are a true barrier to entry to new participants. Wolverine calculates a new entrant into the equity space with 10 external customers and 10 employees would be required to spend **$370,073 monthly**[9], simply to obtain colocation, ports, and the lowest latency market data. As noted in Barron's, more than thirty market makers (including some very prominent firms) have ceased market making in options on CBOE since 2013.[10] This exodus is directly attributable to the cost of trading. It likely has caused a diminution in the quality of executions for retail customers.

We concur with the general conclusions of SIFMA's analysis regarding escalating market data costs[11]. In fact, the numbers are even higher (for example, on page 16 of their comment letter), as SIFMA did not include NYSE LCN-LX port fees and colocation fees in their analysis.

9 2x5kw colocation plus two cross connects at each of NYSE, Nasdaq, and Secaucus = $35,273. Ports: 2 each of 10Gb NYSE LCN-LX, Nasdaq Ultra, and Bats 10Gb = $89,000. Market Data: Non-display Cat 1 + 2 + 3, 10 External Users and 10 Internal display users, and internal and redistribution fees, for NYSE + Arca + American Integrated, Nasdaq TotalView FPGA ITCH + PSX + BX, CBOE EDGX/EDGA/BZX/BYX (including 1 SPIN and GRP ports for each), and SIP (CTA/UTP) Tape A + B + C = $245,800.

10 Steven M Sears, Market Makers in Equity Options are Vanishing, Barron's June 2, 2017. https://www.barrons.com/articles/market-makers-in-equity-options-are-vanishing-1496459364

11 https://www.sifma.org/wp-content/uploads/2018/10/File-No.-4-729-SIFMA-Comments-on-Roundtable-on-Market-Data-and-Market-Access-October-24-2018-002.pdf

Wolverine appreciates the SEC acting as a critical component to monitor and correct violations of the Exchange Act. Please contact me at [redacted] or [redacted] if Wolverine can be of further assistance.

Sincerely yours,

David L. Cavicke

David L. Cavicke
Chief Legal Officer
Chief Compliance Officer
Wolverine Execution Services, LLC
Wolverine Securities, LLC
Wolverine Trading, LLC
Wolverine Trading Technologies, LLC