

# TMX Operational Notice

April 30, 2018

**Incident Date:** April 27, 2018

**Incident Summary:**

At 1:39 p.m. an internal alert was generated indicating access to some trading components had become offline.

At 1:40 p.m. we received several calls from external participants indicating they were not receiving any order acknowledgements.

At 1:41 p.m. we received several calls from access vendors indicating they had lost connectivity to order entry

Internal Incident Management was initiated and External communication was sent at 1:48 p.m. As per our policy and procedure, an incident management bridge was opened and all external participants were asked to join for official updates.

Throughout this time period, external participants had no access to order entry for all TSX Equity markets. As well, no market data was being disseminated.

After a thorough investigation, the root cause was identified. The process to recover and recycle would have taken us well past the regular market closing time thus a decision to not invoke our DR plan was made.

At 2:50 p.m. we notified our market participants that a decision was made to leave all trading down for the remainder of the day.

At 3:54 p.m. we advised the trading community that we would be using the last boardlot traded price for the purpose of determining the TSX and TSXV Equities closing price and the respective boardlot size for Monday, April 30.

A complete list of securities and their respective closing prices were disseminated in a subsequent email.

All open orders (with the exception of Day or GTD which would have expired) will remain in the continuous limit order book.

**Services Impacted:**

Order Entry for all TMX Equity Markets

Feeds for all TMX Equity Markets

**Problem Analysis:**

A central storage appliance encountered a hardware failure in one of its communication management components. The appliance has redundancy built in however when hardware failure occurred the redundant communication management module was unable to take over the role of primary thus failover did not succeed. This subsequently resulted in the entire storage array being offline for the trading applications that rely on centralized storage.

This incident is confirmed not to be a cyber security attack or other technology change related incident.

**Resolution:**

1. The failed communication management storage module was replaced and centralized storage array health was verified as normal
2. All applications that relied on the centralized storage were brought back online
3. Data integrity checks were completed
4. A start-up validation of the entire trading enterprise was completed on Saturday, April 28 with no issues to report
5. System ready for start of business on Monday, April 30
6. **With respect to the permanent fix of the failover logic, our storage manufacturer has identified the root cause and they are working on giving us a patch update over the next few days.**
7. **In the meantime we have taken necessary measures to ensure we have the ability to run our markets**

Market participants are strongly encouraged to do a complete reconciliation of all trades executed on April 27. Please contact TMX Market Operations at 416-947-4357 or by email at [trading\\_services@tmx.com](mailto:trading_services@tmx.com) for assistance with any reconciliation issues.