

FAIR AND EQUITABLE ACCESS POLICY

Name of Policy	Fair and Equitable Access Policy
Description of Policy	Fair and Equitable Access to Stock Exchange Infrastructure Policy
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Policy status	New Policy

Approval authority	NSE Board
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Email to provide feedback	fair.equitable@nse.co.in
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1. Introduction

National Stock Exchange of India Limited (hereinafter referred to as **Exchange**) endeavours to provide fair and equitable access to its trading infrastructure and market data feeds. This document has been formulated to outline the policies that the Exchange implements internally towards achievement of this objective.

The Exchange provides its members with an electronic trading system, backed by order matching engine, as well as servers & network infrastructure, that allows them to connect and place orders on the Exchange. Trading infrastructure has evolved significantly over the years and includes mechanisms such as high frequency algorithmic trading, and direct access arrangements. The access to such trading infrastructure has also advanced over the years and now includes members' technology infrastructure being co-located (COLO Member) at the Exchange data center.

In addition to the above, the Exchange also provides market data feeds to its members and a number of other stakeholders who subscribe to these feeds.

Based on the broad principles set out below, the Exchange endeavours to provide, all members and market data subscribers - trade, order and market data, as applicable, with similar latency and response times as compared to others availing the same facility from the Exchange.

The following schematic diagram provides a high-level overview of the manner in which members and subscribers currently access trading infrastructure and are provided market data, as applicable.

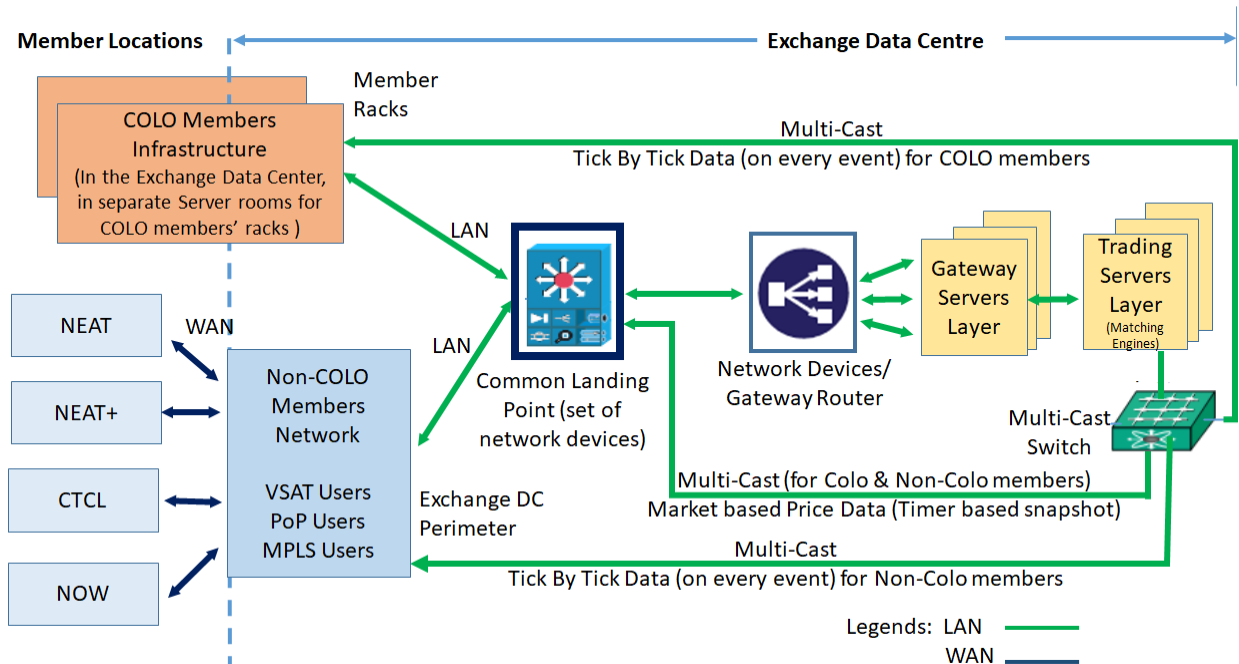


Figure 1: Schematic Diagram for COLO and Non-COLO Members accessing the Trading Servers (/Matching Engines) in the Exchange Data Centre

The above diagram highlights the portion of the network and infrastructure owned/controlled by the Exchange. COLO members' infrastructure is connected to the Exchange trading infrastructure on a fibre optic cable. This cable terminates at common landing point as depicted in Figure 1. Similarly, Non-COLO Members' connectivity also terminates at the common landing point provided by the Exchange.

COLO members connect to the Exchange Trading infrastructure and market data feed over Local Area Network (LAN) using its own infrastructure which is placed in a specifically earmarked space within the Exchange Data Centre.

All other members connect to the trading infrastructure and market data feed by connecting to the perimeter of the Exchange data centre. These members are divided into different classes on the basis of the choice of network such as P2P, MPLS, and VSAT links.

Members access the systems of the Exchange over a network path of their choice. As a result, any impact of the path chosen by the members on latency and performance to connect to the trading infrastructure will be their individual responsibility. The Exchange will only be responsible for the latency and performance of the network components owned/controlled by the Exchange.

The Exchange, from time to time, may recommend certain networking equipment based on advice received by it. It should be noted that the Exchange will highlight if any particular make / model / technology is required and the reason thereof. In general, all members are free to choose the technology they deploy for the infrastructure and technologies which are owned

and controlled by the members themselves including any of the providers and subscription services that the members subscribe to.

The following paragraphs further provide details of the components of the Exchange's trading infrastructure. The trading infrastructure has three major components:

- Gateway servers;
- Trading servers; and
- Post Trade servers

At the time of initial login all members connect to the Gateway Router, which will assign a Gateway server. The endeavour of the Exchange is to distribute the member load equitably across servers meant for this purpose. The Gateway servers also act as a gatekeeper for monitoring the burst rate, as subscribed by the members.

Post login, the order data as received from the members are transmitted using same methodology from Gateway servers to the relevant matching engine where a particular asset is being traded. Order processing within the matching engine is carried out using time price priority algorithm based on time stamp at the entry point of the matching engine. There could be one or more matching engines for an asset class, however a Symbol (traded Security) will be available for trading only on one matching engine across the Exchange.

Orders converted to trades within the Matching engines/Market/Trading servers are passed on to the Post Trade servers for clearing and settlement purposes.

The Exchange disseminates market data using multicast protocols. This is called Multicast Tick by Tick (MTBT). The market data is disseminated to the members and subscribers simultaneously.

2. Objective

The following are the key objectives of this policy.

- To ensure fair and equitable access to the trading infrastructure to all the members of the Exchange based on the service that they have opted for
- To ensure fair and transparent access to market data for all the subscribers of the market data
- To comply with the objectives set out by the Exchange with regard to fair and equitable access and also to meet regulatory requirements.

3. Scope & Exclusions

Fair and equitable access needs to be compared within the same relevant peer set i.e. between COLO members or between NON-COLO members. Also, within a particular peer group, the comparison needs to be within a class of trading members and not across classes.

Applicability of this policy document is for following categories:-

- (i) Asset classes – Equity, Equity Derivatives, Currency Derivatives and Commodity Derivatives only for Non COLO users
- (ii) User category – Trading Members and Market data subscribers only
- (iii) System – NSE Trading Platform

The following aspects are excluded from the scope and applicability of this policy:

- All the infrastructure that is not owned / controlled by the Exchange
- Non-COLO members' connectivity/access path from their endpoints till the perimeter of the Exchange data center
- Infrastructure owned by COLO Members from the member rack switch to their end points
- Any assistance / connectivity provided to connect to other exchanges for order routing or market data access
- Latencies in data received by members due to type of network (P2P, MPLS, and VSAT), subscribed by them

4. Policy Guidelines

- All network elements and trading infrastructure owned / controlled by the Exchange must synchronize its system clocks with the atomic clock before the start of market such that the system clocks have precision of at least one microsecond, and accuracy of at least +/-one millisecond. The Exchange will deploy a time server within the Exchange data center to achieve this.
- All network elements, Trading servers and infrastructure will use the time service from the common Time Server deployed in Exchange data center.
- Exchange will endeavor to ensure that there will be a common landing point for all members and the network traffic from there on will no longer be distinguished based on its mode of connectivity
- Exchange will endeavor to ensure that all COLO members experience similar latency from the member's switch within the rack allocated to them to Common Landing Point, which is connected using fiber optic cables
- The racks for the COLO members should have connectivity to the trading infrastructure with fiber optic cables which are of similar length
- Exchange will endeavor to ensure that all COLO and NON-COLO members experience similar latency from the Common Landing Point onwards

- Exchange will endeavor to use all equipment of same make / model / specifications from Common Landing Point onwards
- Network infrastructure (as defined in section 1 above) owned and controlled by the Exchange for all similar class of members should be similar for that class of members
- Network hops for each class of trading members should be similar
- For two (or more) connections approaching trading infrastructure simultaneously to login, across multiple trials, the system should NOT exhibit a bias towards any one connection
- Exchange will strive to distribute connection request based on the least used gateway; in a scenario of multiple gateways having similar used capacity then a gateway will be randomly assigned.
- Exchange will ensure that for any two (or more) connections, which have already logged in and are placing multiple orders for the same asset class in a given period of market activity, the platform should not exhibit a bias towards any one connection over the other
- Exchange will ensure that the start time of the Exchange trading infrastructure is publicly announced before hand and has no bias towards or against any of the connection requests.
- Start time logs shall be maintained as per the Data Retention Policy¹.
- In the case of any exigencies where matching engine needs to be restarted, Exchange will ensure that all members are stopped from trading on that matching engine at the same instance and the trading window reopens at the same instance for all members.
- Exchange will ensure that market data and/or information sent out by Exchange to its members is disseminated to all members at the same time
- Exchange will periodically monitor the service quality of market data feeds
- Exchange will periodically monitor network path latency
- Exchange will publish reports on network path latencies observed on its website as required by the prevailing regulations. Currently COLO latencies need to be published every quarter

5. Stakeholder Group of the Exchange

Stakeholders are those individuals, groups of individuals or organisations that affect and/or could be affected by the activities, products or services and associated performance of the Exchange.

The Exchange has identified the below stakeholder groups for the purpose of this Policy:

- Regulators
- Auditors
- Employees
- Members
- Listed Companies
- Government
- Shareholders
- Media
- Communities/Institutions the Exchange supports

¹ NSE Data Retention Policy is available on the NSE intranet.

6. Policy Review Mechanism and Periodicity

This Policy would be reviewed at least on an annual basis or earlier if triggered by events which require review and update.

Any changes in the policy may be suggested by the business teams but would ultimately need to be reviewed and approved by the Standing Committee of Technology and recommended for approval to be accorded by the Board of Directors.

7. References

Following NSE Policy documents and SEBI circulars are referenced while preparing this policy:

- NSE Co-Location Services Policy v1.0 (May 1, 2017) Document in iGrafx
<http://igrafx.nse.co.in:8080/Process/COLO/001>
- Co-location / proximity hosting facility offered by stock exchanges
SEBI Circular: CIR/MRD/DP/07/2015, issued on May 13, 2015
- Review of guidelines for Co-location / proximity hosting facility offered by Stock Exchanges
SEBI/HO/MRD/DP/CIR/P/2016/129, issued on Dec 1, 2016
- Fair and transparent access to data feeds of the stock exchanges
SEBI Circular: SEBI/HO/MRD/DP/CIR/P/2017/08, issued on January 20, 2017
- Measures for Strengthening Algorithmic Trading Framework - This memorandum was presented to the Board of NSE in its meeting held on May 2018, various measures to address the concerns relating to market quality, market integrity and fairness on account of usage of Algorithmic Trading and Colocation in Indian securities market. Issued on April 2018.
https://www.sebi.gov.in/sebi_data/meetingfiles/apr-2018/1524113320566_1.pdf

8. Glossary of Terms

- COLO member – Exchange provides Data Center Space/Power/Cooling to host member racks for deploying their custom trading software (including algorithmic trading) in the Exchange premises
- Non-COLO Members – Members who use exchange provided trading software or custom trading software deployed out of their own premise, and using Exchange provided network connectivity through any one of these methods - Point to Point Network, VSAT based connectivity through Satellite and MPLS cloud. Non-COLO members are further sub divided into classes based on the connectivity they choose i.e. all VSAT members will be in one class, P2P member will be another class and MPLS cloud members will be another class.
- Class of Trading Member – Its classification of trading member based on type of network connectivity e.g. VSAT, P2P, MPLS, LAN, used to connect with the trading infrastructure in Exchange data center
- Market data subscribers – Entities / individuals who avail market data from the Exchange / its subsidiaries which can further be provided to their clients
- NEAT – National Exchange for Automated Trading is a thick client trading application supplied by Exchange to Members only. There are other variants of NEAT e.g. NEAT+
- CTCL – Computer to Computer Link
- NOW – ‘NEAT on Web’ is a browser based trading client available on the Internet. Exchange is launching new version of NOW in 2019-2020 as known as NOW2.0.
- ASP – Application Service Providers for Trading Front End on Web and Mobile
- Market Data/Tick By Tick Data - The exchange provides market data (price and volume related) to its Trading Members in the form of Market by Price (MBP) and Market by Order (MBO) for Auction market. Market data multicast is refreshed either at fixed time interval or are event driven.
- Multicast technology – Multicast is a type of technology which transmits data to all the registered network nodes at the same time irrespective of time gap in registration of the nodes on the multicast network.
- P2P – Peer to Peer connectivity between member infrastructure and the Exchange Data Center
- MPLS – Multiprotocol Label Switching connectivity between member infrastructure and the Exchange Data Center
- VSAT – Very Small Aperture Terminal connectivity between member infrastructure and the Exchange Data Center
- Burst rate – The burst rate is the number of orders a member can enter per second which are monitored by the Gateway server layer. Different burst rates are available which can be subscribed by the trading members basis their requirements