

	HEADERS	DETAILS
<p align="center">1. Intimation of Incident (T-day, within 1 Hour of the Incident)</p>	1. Letter / Report Subject -	Reporting of technical glitch
	Name of the Member --	Zerodha Broking Limited
	Member Code -	NSE: 13906; BSE: 6498, MCX: 56550
	2. Designated Officer (Reporting Officer details)	Name: Venu Madhav
	3. Date & Time of Incident	27th April 2023, 9:36AM to 9:48AM
	4. Exchanges on which Technical Glitch was encountered (NSE, BSE, MCX, NCDEX, MSEI)	NSE (NFO only)
	5. Intimation to clients about the Technical Glitch. (Please attach screenshots of communications to clients)	Bulletin
	6. Network Connectivity Issues / Hardware Issues / Software Issues / Human Error / Other (Please Specify (if more than one, please separate with commas))	Network Connectivity Issues at Refinitiv (an exchange empanelled RMS and OMS vendor level)
	The issue was Intermittent.	
	The impact was on the order placement, order modifications, and order cancellations between 9:36 AM to 9:48 AM intermittently.	
	The said issue did not affect all users, but only a set of users operating out of a particular Silo (Setup).	
	A bulletin was put up on our website informing clients about the issue.	
	We immediately raised a ticket with Refinitiv.	
7. Additional Details about the Technical Glitch, if Any.	The issue was resolved at 9:48AM	
	1. Date & Time of Incident & Incident duration (in Minutes)	27th April 2023, 9:36AM to 9:48AM (12 minutes)
		Order placement, order modifications, and order cancellations on our trading platform were impacted intermittently on NSE(NFO) from 9:36 AM to 9:48 AM owing to what seems to be a network connectivity issue at Refinitiv's end (exchange empanelled RMS and OMS vendor).
		The impact was on the order placement, order modifications, and order cancellations between 9:36 AM to 9:48 AM intermittently.
		The said issue did not affect all users, but only a set of users operating out of a particular Silo (Setup).
		The issue was fixed by the Refinitiv team.
2. Incident Description		RCA from our OMS vendor Refinitiv is awaited.
		We immediately notified the Refinitiv team by raising a ticket.
		A bulletin was put up on our website informing clients about the issue.
3. Immediate action taken (provide brief details)		A banner was also put up on our Support portal.

2. Preliminary Incident Report (T+1 day)	4. Business Impact i) Number of Clients Impacted ii) Any other impact	i. A small section of our clients were impacted by the incident. The number of unique users impacted by this incident were 26.8k and the total orders impacted was 33.1k. There were very few complaints (527 calls and 205 tickets across all segments). ii. Further, there was no other impact.
	5. Were alternate trading channels available for clients (list all the alternate channels) i) Was there a spike in traffic on the alternate channels available to clients? If yes, provide details.	Call and Trade facility was available for the impacted clients. The issue was Intermittent. The users were able to place orders and modify/ cancel the orders post retries even when the issue was ongoing.
	6. Was the issue caused or encountered by a third-party vendor or service provider? i) Name of the third-party vendor or service provider and a brief description of the issue. ii) Do you have a back-up vendor for the said services	i. Yes, the issue occurred due to network connectivity issues at Refinitiv (an exchange empanelled RMS and OMS vendor level). ii. We are in the process of building our own RMS and OMS system.
	7. Was the issue encountered on the Exchange-provided environment? If Yes, kindly provide details of intimation and communication sent to the Exchange.	No
	8. Did you move operations to the Disaster Recover (DR) site? If, Yes, what was the Recovery Time?	No
	1. Date & Time of Incident & Recovery & Incident duration (in Minutes)	27th April 2023, 9:36AM to 9:48AM (12 minutes)
	2. Incident Description & chronology of events (Please provide brief details)	Order placement, order modifications, and order cancellations on our trading platform were impacted intermittently on NSE(NFO) from 9:36 AM to 9:48 AM owing to an issue with an application which connects the adapter to NSE at Refinitiv's end (exchange empanelled RMS and OMS vendor). The said issue did not affect all users, but only a set of users operating out of a particular Silo (Setup). The issue was fixed by the Refinitiv team.
	3. Business Impact: Please provide details on the points below: i) Number of clients impacted ii) Number of client orders impacted iii) Any P&L impact iv) Any other impact on Business	i. A small section of our clients were impacted by the incident. The number of unique users impacted by this incident were 26.8 k. ii. The total orders impacted was 33.1k. iii. Further, there was no impact on P&L or any other impact.
4. Details of Client Complaints Received (Please provide details of claims of impacted clients) i) Number of Complaints Received ii) Number of Complaints Settled iii) Number of pending complaints iv) Total amount claimed by complainants	i. There were very few complaints. 527 calls, 205 tickets and 1 exchange complaint across all segments. ii. All the client complaints via tickets and calls have been resolved. iii. There is one complaint open at the exchange as on date of submission of this RCA. We have submitted our response to the exchange regarding the complaint. iv. The amount claimed by the complainants is about 4k.	

<p>3. RCA of Technical Glitch Incident (T + 14 days)</p>	<p>5. Root Cause Summary (Pl attach the detailed Report separately)</p>	<p>We raised the issue with Refinitiv (an exchange empanelled RMS and OMS vendor level). According to the application logs of the application that connects the adapter to NSE, it was observed that from 'Thu Apr 27 09:36:05 2023', the app successfully sent orders but didn't receive any response. This issue resulted from the send buffer of the socket connected to NSE getting full and entering hung state as the app continued to send orders. The application eventually became unresponsive and when it was unable to send further data, Refinitiv had to manually force kill it. However, after restarting, the app resumed normal operation.</p> <p>Further, Refinitiv has also conducted examination on network for any issues and has not found any abnormalities. Following their recommendation, we have submitted a ticket to NSE to investigate any potential network issues at the exchange end. We are currently awaiting a response from NSE regarding this matter. (Case number: CS1229878).</p>
	<p>6. If the issue was caused or encountered by a third-party vendor or service provider, Please provide the below details: i) What services are being provided by the third-party vendor or service provider? ii) Time taken (in Minutes) by third-party vendor or service provider to resolve the issue.</p>	<p>i. Yes, the issue occurred due to network connectivity issues at Refinitiv (an exchange empanelled RMS and OMS vendor level). ii. The time taken by Refinitiv to fix the issue was 12 minutes.</p>
	<p>7. Has a similar issue been encountered prior to the submission of this RCA Report?</p>	<p>A similar issue hasn't been encountered prior to the submission of this RCA.</p>
	<p>8. Details of long-term preventive action (please provide all action points for long-term preventive action with the date from which they will be implemented) (please use additional sheets if necessary)</p>	<p>1. We have spread our customers across multiple physically independent data centres, OMS installations, and many leased lines with backup lines. Hence only a fraction of users will be impacted in such scenarios. 2. We do have the option to switch the affected adapter servers and the affected CTCL IDs(exchange IDs) manually in case of issues, as all the IDs are multi-locked. 3. To avoid the scenario encountered during this glitch, the Refinitiv team will provide a fix "to send timeout (configurable)" at application, so that this issue of broken socket going in hung state can be avoided.</p>
	<p>9. Provide a detailed Architecture Diagram of the System.</p>	<p>Attached.</p>