Options Price Reporting Authority
400 South LaSalle
Chicago, IL 60605

OPRA Pillar SIP
Version 1.5 – March 26, 2021

OPRA SIP Functional Differences - Current Platform vs Pillar Platform

Outbound Protocol Differences:

	OPRA SIP Behavior - Current Platform	OPRA SIP Behavior - Pillar Platform
Output Protocol - Version	• Output blocks are published with Block Header Version 5 on the Block Header. Heartbeat messages of the retransmission lines are published with Block Header Version 3.	• All output blocks on both real time and retransmission lines are published with Block Header Version 6 on the Block Header
Output Protocol - Block Sequence Numbers	• The Sequence Number field of the Block Header is incremented per block irrespective of the number of messages in the block. • Data recipients request retransmissions based on Block sequence number. A Retransmitted block data matches the original block data and SIP Block Timestamp on the retransmitted block contains the time when the original Block was transmitted. • Once the Block Sequence Number reaches a value of 3,999,999,999, it rolls over and the subsequent block is published with a Sequence Number of 1	• The Sequence Number field of the Block Header indicates the sequence number of the first message in the block. If there is more than one message contained in a block, any messages following the first message are implicitly numbered sequentially. • Data recipients need to request retransmissions based on message sequence number. The retransmission blocks can be packed differently than the original blocks and would have Block Timestamp which represents when the first message in the retransmitted block was originally processed by SIP. • The Block Sequence Number rolls over when the u32 maximum limit is reached (4,294,967,295)

	OPRA SIP Behavior - Current Platform	OPRA SIP Behavior - Pillar Platform
Output Protocol - Block Sequence Numbers Reset	• Upon Disaster Recovery site activation, a Reset Block Sequence Number message (Category H, Type K) is generated, incrementing the multicast lines' block sequence number to a higher number (typically 750,000,000)	• Upon Disaster Recovery site activation or a site failure and recovery, a Reset Block Sequence Number message (Category H, Type K) is generated, resetting the multicast lines' block sequence number to one (1)
Output Protocol - Multicast Setup	• For each unique OPRA real-time production message, there are two redundant multicast data streams. To leverage the redundancy, it is suggested that recipients read from the redundant data feeds • Retransmitted data is published via a single multicast data stream	• Recipients must subscribe to both A and B Multicast channels like any standard multicast data product instead of just one channel, so that if there is any issue with one feed, recipients are able to receive data from the other. • Retransmitted data is published via two distinct multicast data streams for redundancy
Output Protocol - Start of Day	• Start of Day (Category H, Type C) message is published for Extended Sessions at 2:30 AM and for Regular Sessions at 6:10 AM	• Start of Day (Category H, Type C) message is published for both Extended and Regular Sessions at 1:30 AM
Output Protocol - End of Day	• End of Day (Category H, Type J) message is published at ~7:00 p.m. to signal the end of transmission of original data over the lines	• End of Day (Category H, Type J) message is published at ~6:05 p.m. to signal the end of transmission of original data over the lines

	OPRA SIP Behavior - Current Platform	OPRA SIP Behavior - Pillar Platform
Output Protocol - Test Cycles	• Test Cycle Data is published prior to the publication of Start of Day message. Test Cycle is preceded by Start of Test Cycle (Category H, Type A) and followed by End of Test Cycle (Category H, Type B) messages	• Test Cycle schedule prior to Start of Day message; and associated Start of Test Cycle (Category H, Type A) and End of Test Cycle (Category H, Type B) messages are eliminated on Pillar SIP. Test Data publication starts after the Start of Day message and continues throughout the day over Production multicast feeds. Pillar OPRA uses Administrative (Category C) messages for test purposes throughout the day (such Administrative Messages are published with Participant ID = O i.e. OPRA (not an exchange Participant) and contains the Message Header only)
Output Protocol - Control messages	• Control (Category H) message is a variable length message and contains a free form Message Data field • Control (Category H) messages published by OPRA include - Start of Test Cycle (Type A), End of Test Cycle (Type B), Good Morning (Type D), Early Market Close (Type G), End of Transaction Reporting (Type H) and Good Night (Type I) messages	• Control (Category H) message is a fixed length message and contains just the Message Header • Following Control (Category H) messages are not supported - Start of Test Cycle (Type A), End of Test Cycle (Type B), Good Morning (Type D), Early Market Close (Type G), End of Transaction Reporting (Type H) and Good Night (Type I) messages
Line Integrity	• Line Integrity (Category H, Type N) message is transmitted over the multicast lines at intervals of sixty seconds to verify continued integrity of multicast transmission • Line Integrity message transmission stops once End of Day (Category H, Type J) message is published	• Line Integrity (Category H, Type N) message is transmitted over the multicast lines at intervals of ten seconds to verify continued integrity of multicast transmission • Line Integrity message transmission continues after non-sequenced End of Day (Category H, Type J) message is published, as long as system is up

	OPRA SIP Behavior - Current Platform	OPRA SIP Behavior - Pillar Platform
Administrative Message	• Administrative (Category C) is a variable length message. The total length of the variable length optional 'Message Data' Text field cannot exceed 440 characters. • Administrative Message is used by the Participants to publish non-standard information e.g. to transmit FLEX information, or, by OPRA to communicate if OPRA and/or a Participant experiences a failure.	• Administrative (Category C) is a variable length message. The total length of the variable length optional 'Message Data' Text field cannot exceed 200 characters. • Administrative Message is used by the Participants to publish non-standard information e.g. to transmit FLEX information, and by OPRA for test purposes throughout the day. OPRA does not generate Administrative Message to communicate if OPRA and/or a Participant experiences a failure.
Message Routing	• Message are disseminated by OPRA across 48 output lines for Regular Sessions	• There are a total of 96 output lines for Regular Session, however messages are disseminated by OPRA across lines 1-48. Remaining lines 49-96 do not have any symbol traffic distribution and will only publish Line Integrity (Category H, Type N) messages until next traffic redistribution.
Open Interest	• Open Interest (Category d) messages are disseminated by OPRA on Extended Session lines at 2:45 a.m. and on Regular Session lines at 6:30 a.m.	• Open Interest (Category d) messages are not disseminated by OPRA on the Extended Session lines. These messages are disseminated on Regular Session lines at 6:30 a.m.

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Document Version History:

Date	Document Version #	Change Summary
March 26, 2021	1.5	• Clarified usage of Administrative Message as test data and removed its usage by OPRA to communicate any issues
March 19, 2021	1.4	• Updated difference for Test Cycles to add usage of Admin messages for test data
February 19, 2021	1.3	• Updated Block Sequence reset upon DR activation
February 5, 2021	1.2	• Updated Message Routing for additional lines 49-96 • Eliminated Open interest message disseminated on Extended Sessions
January 22, 2021	1.1	• Clarified that all output blocks on both real time and retransmission lines have version 6 • Updated End of Day time
December 16, 2020	1.0	• Initial version of the document