

**OPRA SIP Functional Differences - Current Platform vs Pillar Platform**

**Inbound Protocol Differences:**

	<b>OPRA SIP Behavior - Current Platform</b>	<b>OPRA SIP Behavior - Pillar Platform</b>
Input Protocol - Malformed Blocks	<ul style="list-style-type: none"> <li>If an input Block is incorrectly formatted, currently the OPRA SIP drops such a block and continues to process subsequent Blocks, identified based on Block Separator</li> </ul>	<ul style="list-style-type: none"> <li>Any incorrectly formatted block received on the Participant input line is rejected and the line is immediately disconnected. A block is considered as incorrectly formatted under the following conditions:               <ul style="list-style-type: none"> <li>Block with incorrect value in any field in the Block Header</li> <li>Block containing message with incorrect Message Length, or, unsupported Message Category &amp; Type</li> <li>Block containing more than 1 Control message (Category H), Administrative message (Category C) or Sequence Status message (Category N)</li> </ul> </li> </ul>
Input Protocol - Session Level Rejects	Feature not applicable	<ul style="list-style-type: none"> <li>Messages rejected due to incorrect Session Layer information are considered as Session Level Rejects. Upon breaching the maximum reject count threshold for Session Level Rejects, the input Line is disconnected. Session Level Rejects include any rejects due to:               <ul style="list-style-type: none"> <li>Lower than expected Block Sequence Number</li> <li>Incorrect Participant ID or Session Indicator</li> </ul> </li> </ul>
Input Protocol - Denial of Service	Feature not applicable	<ul style="list-style-type: none"> <li>When a line is disconnected upon breaching threshold of Session Level Rejects, a Denial of Service is invoked. Reconnection is not allowed on such a line for a configured duration of time. Upon reconnection, reject counter is reset</li> </ul>

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		and can be breached again resulting in subsequent Denial of Service.
Input Protocol - Block Version	<ul style="list-style-type: none"> <li>Input blocks are accepted with Block Header Version 2 and Version 4. Block Header version 2 supports 4-Byte Message Header while Block Header version 4 supports an extra 4-byte PRN (Participant reference Number) field in the Message Header.</li> </ul>	<ul style="list-style-type: none"> <li>Input blocks are accepted with Block Header Version 4 (8 byte Message Header Length, including the Participant reference Number field). Block Header version 2 is not supported.</li> </ul>
Input Protocol - Administrative Message	<ul style="list-style-type: none"> <li>Administrative (Category C) is a variable length message. The total length of the variable length 'Message Data' Text field cannot exceed 440 characters.</li> <li>Message Data field in the variable length Administrative (Category C) message is free form and can contain any ASCII or Binary Data</li> </ul>	<ul style="list-style-type: none"> <li>Administrative (Category C) is a variable length message. The total length of the variable length 'Message Data' Text field cannot exceed 200 characters.</li> <li>Message Data field in the variable length Administrative (Category C) message can contain printable ASCII characters only</li> </ul>
Input Protocol - Control Messages	<ul style="list-style-type: none"> <li>Control (Category H) message is a variable length message and contains a free form Message Data field</li> <li>Participants can send various Control (Category H) messages including - Good Morning (Type D), Early Market Close (Type G), End of Transaction Reporting (Type H) and Good Night (Type I) messages</li> </ul>	<ul style="list-style-type: none"> <li>Control (Category H) message is a fixed length message and contains just the Message Header</li> <li>Following Control (Category H) messages are not supported - Good Morning (Type D), Early Market Close (Type G), End of Transaction Reporting (Type H) and Good Night (Type I) messages</li> </ul>

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Input Protocol - Block Sequence Numbers	<ul style="list-style-type: none"> <li>First expected input Block Sequence Number is 0</li> <li>The Block Sequence Number rolls over when it reaches a value of 3,999,999,999</li> </ul>	<ul style="list-style-type: none"> <li>First expected input Block Sequence Number is 1</li> <li>The Block Sequence Number rolls over when the u32 maximum limit is reached (4,294,967,295)</li> </ul>
Input Protocol - Message Count Status	<ul style="list-style-type: none"> <li>The count of messages received from Participant to OPRA on an individual line (as provided by OPRA to participant on the Message Count Status Response - Category N, Type S message) rolls over after 9,999,999,999</li> </ul>	<ul style="list-style-type: none"> <li>The count of messages received from Participant to OPRA on an individual line (as provided by OPRA to participant on the Message Count Status Response - Category N, Type S message) does not rollover. OPRA can specify the count up to the maximum value of the 8 byte field</li> </ul>
Input Protocol - Dual Input	<ul style="list-style-type: none"> <li>Participants can connect and submit data to either their Primary or Backup connection on the Primary Data Center. Connections to the Backup Data center are not allowed unless OPRA fails over to the Backup Data Center.</li> </ul>	<ul style="list-style-type: none"> <li>Participants can connect and submit data to their Primary or Backup connection on either the Primary Data Center or the Backup Data center. OPRA accepts the data from either site and processes it on its Primary (active) Data Center and disseminates data from that site.</li> </ul>
Input Protocol - Throttling	<ul style="list-style-type: none"> <li>All Participants have pre-assigned input rate targets which are enforced through continuous input pacing by the OPRA Processor. The input pacing rates are not fixed and can vary depending on changing traffic conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Input messages for each line are read at a pre-assigned rate. A line is throttled when a participant exceeds the maximum number of messages allowed during the current time window. Throttled messages are queued and processed in time sequence as the message read rate allows.</li> </ul>

**Functional Differences affecting Participant Input:**

	CTA SIP Behavior - Current Platform	CTA SIP Behavior - Pillar Platform
Start of Day Processing	<ul style="list-style-type: none"> <li>Each participant is configured with a specific Start Time. A Start of Day (Category H, Type C) message is sent on respective Participant's Input lines at the configured time</li> </ul>	<ul style="list-style-type: none"> <li>All participants are configured with a common Start Time. A Start of Day (Category H, Type C) message is sent on all Participant's Input lines simultaneously.</li> </ul>
End of Day Processing	<ul style="list-style-type: none"> <li>The End of Day is set as 7:00 p.m. System is brought down at this time and Participant cannot transmit any further messages to OPRA.</li> </ul>	<ul style="list-style-type: none"> <li>The End of Day is set as 6:05 p.m. At this time End of Day (Category H, Type J) message is sent by OPRA to a Participant to signal the end of transmission of data over the input lines. Participant cannot transmit any further messages to OPRA.</li> </ul>
Line Integrity	<ul style="list-style-type: none"> <li>Upon receiving a Line Integrity message (Category H, Type O) from a participant, OPRA sends a corresponding Line Integrity message (Category H, Type O) with sequence number and timestamp in the opposite direction back to the Participant</li> </ul>	<ul style="list-style-type: none"> <li>Line Integrity (Category H, Type O) message is transmitted from OPRA to all participants at intervals of ten seconds to verify continued integrity of input line and is not dependent on receiving a Line Integrity message from a participant</li> </ul>
Timeout Duration	<ul style="list-style-type: none"> <li>Input lines for each participant can be optionally configured with different timeout duration. If configured for a timeout, a line is disconnected if no input data is received for the defined time interval.</li> </ul>	<ul style="list-style-type: none"> <li>Input lines for all participants are configured with the same predefined timeout duration. Any input line is disconnected if no input data is received for the defined time interval. Timeout disconnect is not an opt-in and is enforced on every participant's input lines.</li> </ul>

OPRA Pillar SIP  
Version 1.1 - January 22, 2021

**Document Version History:**

Date	Document Version #	Change Summary
January 22, 2021	1.1	<ul style="list-style-type: none"><li>• Updated End of Day time</li></ul>
December 16, 2020	1.0	<ul style="list-style-type: none"><li>• Initial version of the document</li></ul>