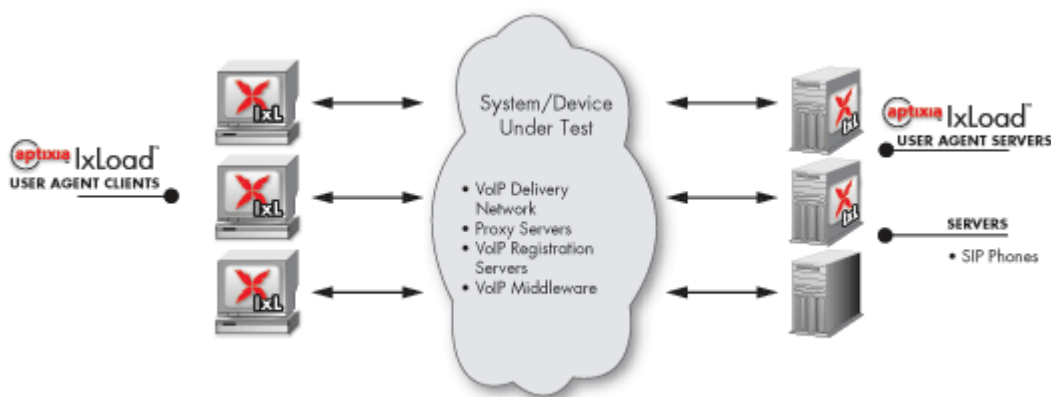




## VoIP – SIP, MGCP

Aptixia IxLoad can test the performance of VoIP networks and devices by emulating SIP and MGCP user agents.



IxLoad can be used to:

- Test the scalability and performance of proxy servers, middleware systems, registration servers and session border controllers
- Test the performance of Triple play devices and delivery networks by intermixing data traffic with delay and jitter sensitive voice and video traffic

### Features

- UDP and TCP Transport
- MOS scores reported on a per call basis
- Support for user-defined authentication and registration parameters
- Support for sequence generators to easily create large number of VoIP calls using unique user credentials
- Ability to use audio files as payload in a voice session

- Ability to create realistic and complex call flows
- Support for path confirmation using synthetic data or DTMF tones
- Statistics reported on an average and for each call
- Emulate jitter buffers in packets or duration in ms
- Ability to adjust the size of the jitter buffer in real-time

## Specifications

### SIP

<b>Emulation</b>	SIP User Agent (UA) emulation with signaling and RTP media
<b>Codecs</b>	G.711 A-Law, G.711 $\mu$ -Law, G729 A, G.729 B, G.726, G.723.1
<b>Timers</b>	T1, T2, T4, TC, TD and Active Call Timeout
<b>Features</b>	<ul style="list-style-type: none"> <li>• Customizable SIP header order</li> <li>• Option to create specific rules to control handling of SIP messages</li> <li>• Option to configure SIP User Agent Server for Stateless operation.</li> </ul>

### MGCP

<b>Emulation</b>	MGCP end-points and gateway emulation
<b>Codecs</b>	G.711 A-Law, G.711 $\mu$ -Law, G729 A, G.729 B, G.726, G.723.1

## Statistics

### SIP

<b>Client</b>	1. SIP calls initiated	53. RTP Jitter Max
	2. SIP calls completed	54. RTP Packets With Jitter Up To 1ms
	3. SIP calls active	55. RTP Packets With Jitter Up To 3ms
	4. SIP INVITE client transactions initiated	56. RTP Packets With Jitter Up To 5ms
	5. SIP INVITE client transactions succeeded	57. RTP Packets With Jitter Up To 10ms
	6. SIP INVITE client transactions failed	58. RTP Packets With Jitter Up To 20ms
	7. SIP INVITE client transactions failed (TIMER B)	59. RTP Packets With Jitter Up To 40ms
	8. SIP INVITE client transactions failed (TRANSPORT ERROR)	60. RTP Packets With Jitter More Than 40ms
	9. SIP INVITE client transactions failed	61. RTP DTMFs Detected

	<p>(TRANSACTION TIMEOUT TIMER)</p> <p>10. SIP INVITE client transactions failed (5xx)</p> <p>11. SIP NON-INVITE client transactions initiated</p> <p>12. SIP NON-INVITE client transactions succeeded</p> <p>13. SIP NON-INVITE client transactions failed</p> <p>14. SIP NON-INVITE client transactions failed (TIMER F)</p> <p>15. SIP NON-INVITE client transactions failed (TRANSPORT ERROR)</p> <p>16. SIP INVITE requests sent</p> <p>17. SIP ACK requests sent</p> <p>18. SIP BYE requests sent</p> <p>19. SIP REGISTER requests sent</p> <p>20. SIP INVITE messages retransmitted</p> <p>21. SIP NON-INVITE requests retransmitted</p> <p>22. SIP INVITE requests unexpected</p> <p>23. SIP ACK requests unexpected</p> <p>24. SIP BYE requests unexpected</p> <p>25. SIP CANCEL requests unexpected</p> <p>26. SIP UNKNOWN messages unexpected</p> <p>27. SIP UNKNOWN requests unexpected</p> <p>28. SIP 1xx responses expected</p> <p>29. SIP 1xx responses unexpected</p> <p>30. SIP 2xx responses expected</p> <p>31. SIP 2xx responses unexpected</p> <p>32. SIP 3xx responses expected</p> <p>33. SIP 3xx responses unexpected</p> <p>34. SIP 4xx responses expected</p> <p>35. SIP 4xx responses unexpected</p> <p>36. SIP 5xx responses expected</p> <p>37. SIP 5xx responses unexpected</p> <p>38. SIP 6xx responses expected</p> <p>39. SIP 6xx responses unexpected</p> <p>40. RTP Bytes Sent</p> <p>41. RTP Packets Sent</p> <p>42. RTP Tx Jitter (ns)</p> <p>43. RTP Tx Packets Dropped</p> <p>44. RTP Dropped Packets</p> <p>45. RTP Bytes Received</p> <p>46. RTP Packets Received</p> <p>47. RTP Payload Bytes Received</p> <p>48. RTP Bad Packets Received</p>	<p>62. RTP Good DTMF Sequences Detected</p> <p>63. RTP Bad DTMF Sequences Detected</p> <p>64. RTP Packets Dropped By Jitter Buffer</p> <p>65. RTP MOS Average Instant</p> <p>66. RTP MOS Worst Instant</p> <p>67. RTP MOS Best Instant</p> <p>68. RTP MOS Worst</p> <p>69. RTP MOS Best</p> <p>70. RTP MOS Average Per Call</p> <p>71. RTP MOS Worst Per Call</p> <p>72. RTP MOS Best Per Call</p> <p>73. RTP Calls With Continuous Path Confirmation</p> <p>74. RTP Calls With Interrupted Path Confirmation</p> <p>75. RTP Calls Without Path Confirmation</p> <p>76. SIP Bytes Transmitted</p> <p>77. SIP Bytes Received</p> <p>78. SIP Signaling UDP Packets Transmitted</p> <p>79. SIP Signaling UDP Packets Received</p> <p>80. RTP Path Confirmation Status</p> <p>81. RTP MOS</p> <p>82. RTP Worst MOS</p> <p>83. RTP Best MOS</p> <p>84. RTP Bytes</p> <p>85. RTP Packets</p> <p>86. RTP Bad Packets</p> <p>87. RTP Lost Packets</p> <p>88. RTP Missorder Packets</p> <p>89. RTP Duplicate Packets</p> <p>90. RTP Packets With Jitter Up To 1ms</p> <p>91. RTP Packets With Jitter Up To 3ms</p> <p>92. RTP Packets With Jitter Up To 5ms</p> <p>93. RTP Packets With Jitter Up To 10ms</p> <p>94. RTP Packets With Jitter Up To 20ms</p> <p>95. RTP Packets With Jitter Up To 40ms</p> <p>96. RTP Packets With Jitter More Than 40ms</p> <p>97. RTP Average Jitter (ns)</p> <p>98. RTP Min Jitter (ns)</p> <p>99. RTP Max Jitter (ns)</p> <p>100. RTP DTMFs Detected</p>
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	49. RTP Lost Packets Received 50. RTP Missordered Packets Received 51. RTP Duplicate Packets Received 52. RTP Jitter Min	101. RTP Good DTMF Sequences Detected 102. RTP Bad DTMF Sequences Detected 103. RTP Packets Dropped By Jitter Buffer
<b>Server</b>	1. SIP calls received 2. SIP calls completed 3. SIP calls active 4. SIP INVITE server transactions received 5. SIP INVITE server transactions succeeded 6. SIP INVITE server transactions failed 7. SIP INVITE server transactions failed (TIMER H) 8. SIP INVITE server transactions failed (TRANSPORT ERROR) 9. SIP NON-INVITE server transactions received 10. SIP NON-INVITE server transactions succeeded 11. SIP NON-INVITE server transactions failed 12. SIP NON-INVITE requests retransmitted 13. SIP REGISTER Requests sent 14. SIP 1xx responses expected 15. SIP 2xx responses expected 16. SIP 3xx responses expected 17. SIP 4xx responses expected 18. SIP 5xx responses expected 19. SIP 6xx responses expected 20. SIP 300-699 responses retransmitted 21. SIP INVITE requests expected 22. SIP ACK requests expected 23. SIP BYE requests expected 24. SIP 1xx responses sent 25. SIP 1xx responses unexpected 26. SIP 2xx responses sent 27. SIP 2xx responses unexpected 28. SIP 3xx responses sent 29. SIP 3xx responses unexpected 30. SIP 4xx responses sent 31. SIP 4xx responses unexpected 32. SIP 5xx responses sent 33. SIP 5xx responses unexpected 34. SIP 6xx responses sent 35. SIP 6xx responses unexpected 36. SIP INVITE requests unexpected	54. RTP Jitter Min 55. RTP Jitter Max 56. RTP Packets With Jitter Up To 1ms 57. RTP Packets With Jitter Up To 3ms 58. RTP Packets With Jitter Up To 5ms 59. RTP Packets With Jitter Up To 10ms 60. RTP Packets With Jitter Up To 20ms 61. RTP Packets With Jitter Up To 40ms 62. RTP Packets With Jitter More Than 40ms 63. RTP DTMFs Detected 64. RTP Good DTMF Sequences Detected 65. RTP Bad DTMF Sequences Detected 66. RTP Packets Dropped By Jitter Buffer 67. RTP MOS Average Instant 68. RTP MOS Worst Instant 69. RTP MOS Best Instant 70. RTP MOS Worst 71. RTP MOS Best 72. RTP MOS Average Per Call 73. RTP MOS Worst Per Call 74. RTP MOS Best Per Call 75. RTP Calls With Continuous Path Confirmation 76. RTP Calls With Interrupted Path Confirmation 77. RTP Calls Without Path Confirmation 78. SIP Bytes Transmitted 79. SIP Bytes Received 80. SIP Signaling UDP Packets Transmitted 81. SIP Signaling UDP Packets Received 82. RTP Path Confirmation Status 83. RTP MOS 84. RTP Worst MOS 85. RTP Best MOS 86. RTP Bytes 87. RTP Packets

	<ul style="list-style-type: none"> <li>37. SIP ACK requests unexpected</li> <li>38. SIP BYE requests unexpected</li> <li>39. SIP CANCEL requests unexpected</li> <li>40. SIP UNKNOWN requests unexpected</li> <li>41. SIP UNKNOWN messages unexpected</li> <li>42. RTP Bytes Sent</li> <li>43. RTP Packets Sent</li> <li>44. RTP Tx Jitter (ns)</li> <li>45. RTP Tx Packets Dropped</li> <li>46. RTP Dropped Packets</li> <li>47. RTP Bytes Received</li> <li>48. RTP Packets Received</li> <li>49. RTP Payload Bytes Received</li> <li>50. RTP Bad Packets Received</li> <li>51. RTP Lost Packets Received</li> <li>52. RTP Missordered Packets Received</li> <li>53. RTP Duplicate Packets Received</li> </ul>	<ul style="list-style-type: none"> <li>88. RTP Bad Packets</li> <li>89. RTP Lost Packets</li> <li>90. RTP Missorder Packets</li> <li>91. RTP Duplicate Packets</li> <li>92. RTP Packets With Jitter Up To 1ms</li> <li>93. RTP Packets With Jitter Up To 3ms</li> <li>94. RTP Packets With Jitter Up To 5ms</li> <li>95. RTP Packets With Jitter Up To 10ms</li> <li>96. RTP Packets With Jitter Up To 20ms</li> <li>97. RTP Packets With Jitter Up To 40ms</li> <li>98. RTP Packets With Jitter More Than 40ms</li> <li>99. RTP Average Jitter (ns)</li> <li>100. RTP Min Jitter (ns)</li> <li>101. RTP Max Jitter (ns)</li> <li>102. RTP DTMFs Detected</li> <li>103. RTP Good DTMF Sequences Detected</li> <li>104. RTP Bad DTMF Sequences Detected</li> <li>105. RTP Packets Dropped By Jitter Buffer</li> </ul>
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**MGCP**

<p><b>Client</b></p>	<ul style="list-style-type: none"> <li>1. MGCP Simulated Users</li> <li>2. MGCP connections initiated</li> <li>3. MGCP connections completed</li> <li>4. MGCP connections active</li> <li>5. MGCP connections failed busy</li> <li>6. MGCP connections failed reorder</li> <li>7. Total Message Statistics</li> <li>8. Total MGCP Messages Sent</li> <li>9. Total MGCP Messages Received</li> <li>10. Total MGCP Messages Malformed</li> <li>11. NTFY messages</li> <li>12. NTFY sent</li> <li>13. NTFY rcv</li> <li>14. NTFY success</li> <li>15. NTFY failed</li> <li>16. NTFY dial sent</li> <li>17. NTFY dial rcv</li> <li>18. NTFY dial success</li> <li>19. NTFYdial failed</li> </ul>	<ul style="list-style-type: none"> <li>68. Responses_5XX sent</li> <li>69. Responses_5XX rcv</li> <li>70. RTP Bytes Sent</li> <li>71. RTP Packets Sent</li> <li>72. RTP Tx Jitter (ns)</li> <li>73. RTP Tx Packets Dropped</li> <li>74. RTP Dropped Packets</li> <li>75. RTP Bytes Received</li> <li>76. RTP Packets Received</li> <li>77. RTP Payload Bytes Received</li> <li>78. RTP Bad Packets Received</li> <li>79. RTP Lost Packets</li> <li>80. RTP Misordered Packets Received</li> <li>81. RTP Duplicate Packets Received</li> <li>82. RTP Jitter Min</li> <li>83. RTP Jitter Max</li> <li>84. RTP Packets With Jitter Up To 1ms</li> <li>85. RTP Packets With Jitter Up To 3ms</li> <li>86. RTP Packets With Jitter Up To 5ms</li> </ul>
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20. CRCX messages	87. RTP Packets With Jitter Up To 10ms
21. CRCX sent	88. RTP Packets With Jitter Up To 20ms
22. CRCX recv	89. RTP Packets With Jitter Up To 40ms
23. CRCX success	90. RTP Packets With Jitter More Than 40ms
24. CRCX failed	91. RTP DTMFs Detected
25. MDCX messages	92. RTP Good DTMF Sequences Detected
26. MDCX sent	93. RTP Bad DTMF Sequences Detected
27. MDCX recv	94. RTP Packets Dropped By Jitter Buffer
28. MDCX success	95. RTP MOS Average Instant
29. MDCX failed	96. RTP MOS Worst Instant
30. DLCX messages	97. RTP MOS Best Instant
31. DLCX sent	98. RTP MOS Worst
32. DLCX recv	99. RTP MOS Best
33. DLCX success	100. RTP MOS Average Per Call
34. DLCX failed	101. RTP MOS Worst Per Call
35. RQNT messages	102. RTP MOS Best Per Call
36. RQNT sent	103. RTP Calls With Continuous Path Confirmation
37. RQNT recv	104. RTP Calls With Interrupted Path Confirmation
38. RQNT success	105. RTP Calls Without Path Confirmation
39. RQNT failed	106. MGCP Bytes Transmitted
40. AUEP messages	107. MGCP Bytes Received
41. AUEP sent	108. MGCP Signaling UDP Packets Transmitted
42. AUEP recv	109. MGCP Signaling UDP Packets Received
43. AUEP success	110. RTP Path Confirmation Status
44. AUEP failed	111. RTP MOS
45. AUCX messages	112. RTP Worst MOS
46. AUCX sent	113. RTP Best MOS
47. AUCX recv	114. RTP Bytes
48. AUCX success	115. RTP Packets
49. AUCX failed	116. RTP Bad Packets
50. EPCF messages	117. RTP Lost Packets
51. EPCF sent	118. RTP Missorder Packets
52. EPCF recv	119. RTP Duplicate Packets
53. EPCF success	120. RTP Packets With Jitter Up To 1ms
54. EPCF failed	121. RTP Packets With Jitter Up To 3ms
55. RSIP messages	122. RTP Packets With Jitter Up To 5ms
56. RSIP sent	123. RTP Packets With Jitter Up To 10ms
57. RSIP recv	
58. RSIP success	
59. RSIP failed	
60. Responses_1XX sent	
61. Responses_1XX recv	

	<ul style="list-style-type: none"> <li>62. Responses_2XX sent</li> <li>63. Responses_2XX rcv</li> <li>64. Responses_3XX sent</li> <li>65. Responses_3XX rcv</li> <li>66. Responses_4XX sent</li> <li>67. Responses_4XX rcv</li> </ul>	<ul style="list-style-type: none"> <li>124. RTP Packets With Jitter Up To 20ms</li> <li>125. RTP Packets With Jitter Up To 40ms</li> <li>126. RTP Packets With Jitter More Than 40ms</li> <li>127. RTP Average Jitter (ns)</li> <li>128. RTP Min Jitter (ns)</li> <li>129. RTP Max Jitter (ns)</li> <li>130. RTP DTMFs Detected</li> <li>131. RTP Good DTMF Sequences Detected</li> <li>132. RTP Bad DTMF Sequences Detected</li> <li>133. RTP Packets Dropped By Jitter Buffer</li> </ul>
<p><b>Server</b></p>	<ul style="list-style-type: none"> <li>1. Total MGCP Commands Received</li> <li>2. Total MGCP Responses Received</li> <li>3. Total MGCP Commands Sent</li> <li>4. Total MGCP Responses Sent</li> <li>5. Total MGCP Received Malformed Messages</li> <li>6. NTFY messages</li> <li>7. NTFY sent</li> <li>8. NTFY rcv</li> <li>9. NTFY success</li> <li>10. NTFY failed</li> <li>11. NTFY dial sent</li> <li>12. NTFY dial rcv</li> <li>13. NTFY dial success</li> <li>14. NTFYdial failed</li> <li>15. CRCX messages</li> <li>16. CRCX sent</li> <li>17. CRCX rcv</li> <li>18. CRCX success</li> <li>19. CRCX failed</li> <li>20. MDCX messages</li> <li>21. MDCX sent</li> <li>22. MDCX rcv</li> <li>23. MDCX success</li> <li>24. MDCX failed</li> <li>25. DLCX messages</li> <li>26. DLCX sent</li> <li>27. DLCX rcv</li> <li>28. DLCX success</li> <li>29. DLCX failed</li> <li>30. RQNT messages</li> </ul>	<ul style="list-style-type: none"> <li>38. AUEP success</li> <li>39. AUEP failed</li> <li>40. AUCX messages</li> <li>41. AUCX sent</li> <li>42. AUCX rcv</li> <li>43. AUCX success</li> <li>44. AUCX failed</li> <li>45. EPCF messages</li> <li>46. EPCF sent</li> <li>47. EPCF rcv</li> <li>48. EPCF success</li> <li>49. EPCF failed</li> <li>50. RSIP messages</li> <li>51. RSIP sent</li> <li>52. RSIP rcv</li> <li>53. RSIP success</li> <li>54. RSIP failed</li> <li>55. Responses_1XX sent</li> <li>56. Responses_1XX rcv</li> <li>57. Responses_2XX sent</li> <li>58. Responses_2XX rcv</li> <li>59. Responses_3XX sent</li> <li>60. Responses_3XX rcv</li> <li>61. Responses_4XX sent</li> <li>62. Responses_4XX rcv</li> <li>63. Responses_5XX sent</li> <li>64. Responses_5XX rcv</li> <li>65. MGCP Signaling Bytes Transmitted</li> <li>66. MGCP Signaling Bytes Received</li> <li>67. MGCP Signaling UDP Packets</li> </ul>

	31. RQNT sent 32. RQNT recv 33. RQNT success 34. RQNT failed 35. AUEP messages 36. AUEP sent 37. AUEP recv	Transmitted 68. MGCP Signaling UDP Packets Received 69. MGCP Simulated Users 70. MGCP connections initiated 71. MGCP connections completed 72. MGCP connections active 73. MGCP connections failed busy 74. MGCP connections failed reorder
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## Ordering Information

### 925-3320

Aptixia IXLOAD-B2, Data-Video-Voice Software Bundle, Layer 4-7 Performance Test Application Base Software IXLOAD; plus optional software IXLOAD-MAIL, IXLOAD-STREAM, IXLOAD-DDOS, IXLOAD-U1, IXLOAD-VIDEO, and IXLOAD-VOICE; Supports SSL Client, SSL Server, HTTP, HTTPS, FTP, and TCP; Includes Media Kit

### 925-3330

Aptixia IXLOAD-B3, Triple-Play Software Bundle, Layer 4-7 Performance Test Application Base Software IXLOAD; plus optional software IXLOAD-MAIL, IXLOAD-STREAM, IXLOAD-DDOS, IXLOAD-U1, IXLOAD-VIDEO, IXLOAD-VOICE, and IXLOAD-ADVNET; Supports SSL Client, SSL Server, HTTP, HTTPS, FTP, and TCP; Includes Media Kit

### 925-3106

Aptixia IXLOAD-VOICE, Optional Software, VOIP caller and callee emulation; includes signaling and data generation for voice calls; **REQUIRES** previous purchase of IXLOAD, 925-3300 (IXLOAD-PLUS), OR 925-3310 (IXLOAD-B1)

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