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Conformance Test Specification for Marlin Proximity Specification

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Final

Source
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64

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86 1 Introduction

87 1.1 Document Organization

88 This document describes the Conformance Test Specification for anchor and target
89 implementations of the Marlin Proximity Specification [PROX]. It is organized as
90 follows:

- 91 • (this) introduction, overview, conformance conventions and references
- 92 • Sections for each of the Conformance Test Items. These are:
 - 93 ○ Conformance Test Items for Proximity Check per Connection Type
 - 94 ○ Conformance Test Items for Proximity Check Protocol over UDP
 - 95 ○ Conformance Test Items for Octopus Binding

96 1.2 Overview

97 This document describes the Conformance Test Specification for anchor and target
98 implementations of the Marlin Proximity Specification [PROX]. The goal for this
99 specification is to help ensure interoperability between independent implementations
100 of anchor and target by testing functions specified in [PROX]. In other words, this
101 Conformance Test Specification does not ensure 100% coverage of the specification.
102 It is expected that the tests are expanded upon as implementers verify
103 interoperability with each other.

104 1.3 Conformance Conventions

105 The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”,
106 “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this
107 specification are to be interpreted as described in IETF RFC 2119 [RFC 2119].

108 1.4 References

109 Normative References

[PROX]	Marlin - Proximity Specification, Version 1.0
[RFC 2119]	S. Bradner, <i>RFC 2119 - Key words for use in RFCs to Indicate Requirement Levels</i> , IETF, March 1997, http://www.ietf.org/rfc/rfc2119.txt

110

111 **2 Conformance Test Items for Proximity Check per**
112 **Connection Type**

113 This section describes the REQUIRED common test items for Proximity Check per
114 Connection Type.

115 **2.1 Proximity Check per Connection Type**

116 The following function SHALL be tested for all valid connection types in an
117 implementation:

- 118 • From section 2 of [PROX], when two implementations are connected through
119 IP, the proximity check SHALL be done by using the Proximity Check
120 Protocol over UDP.
- 121 • From section 2 of [PROX], when two implementations are connected through
122 USB, the proximity check SHALL always be considered valid without
123 measurement.
- 124 • From section 2 of [PROX], in all other cases, the proximity check SHALL be
125 considered failure.

126 The Conformance Test SHALL confirm the specifications above in all
127 implementations.

128

129 **3 Conformance Test Items for Proximity Check** 130 **Protocol over UDP**

131 This section describes the REQUIRED common test items for Proximity Check
132 Protocol over UDP.

133 **3.1 Generation of R**

134 The following function SHALL be tested:

- 135 • From section 2.1.3 of [PROX], generate a set R of Q pairs of random
136 numbers.

137 The Conformance Test SHALL confirm the specifications above in both anchor and
138 target.

139

140 **3.2 Message**

141 The following message parameters SHALL be tested:

- 142 • From section 2.1.4 of [PROX], TargetSetupRequest Message includes
143 TargetSessionId, TargetPort, SetupDelay and LoopDelay.
- 144 • From section 2.1.4 of [PROX], TargetSetupResponse Message includes
145 AnchorSessionId, Q, S, AnchorPort and TerminationTimeout. Q MUST NOT
146 exceed 254.
- 147 • From section 2.1.4 of [PROX], ChallengeRequest Message includes
148 TargetSessionId (established during the setup step), i, and R_{2^i} .
- 149 • From section 2.1.4 of [PROX], ChallengeResponse Message includes
150 AnchorSessionId (established during the setup step), i, and $R_{2^{i+1}}$.
- 151 • From section 2.1.4 of [PROX], when the anchor terminates the loop, it MUST
152 send at least one special "Termination" ChallengeRequest UDP datagram.
- 153 • From section 2.1.4 of [PROX], "Termination" ChallengeRequest Message
154 includes TargetSessionId (established during the setup step), i, and R_{2^i} . The
155 value of 'i' is equal to 255 and the bytes for the ' R_{2^i} ' field are all set to 0.
- 156 • From section 2.1.4 of [PROX], all datagrams processed during the RTT
157 measurement loop MUST match the TargetSessionId or AnchorSessionId
158 that were established during the setup phase; all other datagrams MUST
159 NOT be considered part of the session

160 The Conformance Test SHALL confirm the specifications above in both anchor and
161 target.

162

163 **3.3 Obeying Timing Parameters**

164 The following function SHALL be tested:

- 165 • From section 2.1.6 of [PROX], wait at least SetupDelay between the
166 transmission of the TargetSetupResponse reply and the transmission of the
167 first ChallengeRequest datagram.
- 168 • From section 2.1.6 of [PROX], wait at least LoopDelay between two
169 consecutive ChallengeRequest messages while in the RTT measurement
170 loop.
- 171 • From section 2.1.6 of [PROX], a valid under-threshold RTT measurement
172 MUST be 7 milliseconds or less.

173 The Conformance Test SHALL confirm the specifications above in the anchor.

174

175 **3.4 Security Considerations**

176 The following Security Policy SHALL be tested:

- 177 • From section 2.1.7 of [PROX], the anchor MUST choose the seed S with a
- 178 non-guessable secure random or pseudo-random number generator.
- 179 • From section 2.1.7 of [PROX], the RTT measurement loop MUST NOT be
- 180 repeated with the same value of i during a protocol session.
- 181 • From section 2.1.7 of [PROX], the protocol MUST be aborted if any
- 182 unexpected message is received by either party, including:
 - 183 ✧ If the target receives an incorrect value for R_{2^i} in step c.
 - 184 ✧ If Q is larger than the maximum allowed value.
 - 185 ✧ If i is repeated in the loop
 - 186 ✧ If i exceeds Q

187 The Conformance Test SHALL confirm the specifications above in both anchor and

188 target.

190 **3.5 Security Policy**

191 The following Security Policy SHALL be tested:

- 192 • From section 2.1.8 of [PROX], the TargetSetupRequest Message MUST
- 193 follow the 'Integrity Only' policy.
- 194 • From section 2.1.8 of [PROX], the TargetSetupResponse Message MUST
- 195 follow the 'Confidentiality Only' policy.
- 196 • From section 2.1.8 of [PROX], the identifier for this protocol's security policy
- 197 is "urn:marlin:proximityoverudp:1-0:nemo:services:proximity-check:policy:1".

198 The Conformance Test SHALL confirm the specifications above in target.

199

200 **3.6 Message Encodings**

201 The following Message Encodings SHALL be tested:

- 202 • From section 2.1.9 of [PROX], the TargetChallengeRequest and
- 203 TargetChallengeResponse messages use the XML schema in namespace
- 204 "urn:marlin:proximityoverudp:1-0:nemo:services:schemas".
- 205 • The ChallengeRequest and ChallengeResponse messages use the byte
- 206 sequence defined in section 2.1.9 of [PROX]

207 The Conformance Test SHALL confirm the specifications above in both anchor and

208 target.

209

210 **4 Conformance Test Items for Octopus Binding**

211 This section describes the REQUIRED test items for Octopus Binding.

212 **4.1 ProximityRequired Constraint**

213 The following SHALL be tested:

- 214 • From section 3.1 of [PROX], the ESB containing the ProximityRequired
215 Constraint MUST be handled.

216 The Conformance Test SHALL confirm the specifications above in all
217 implementations supporting Octopus Binding.

218

219 **4.2 Control Context**

220 The following SHALL be tested:

- 221 • From section 3.2 of [PROX], when a running control signals that it requires a
222 proximity measurement by carrying a ProximityRequired constraint, in a
223 NEMO protocol session, the host application SHALL reveal the date of the
224 last valid proximity check between the host and the session's peer NEMO
225 node in the context of that running control on Sink/Proximity/LastProbe.

226 The Conformance Test SHALL confirm the specifications above in all
227 implementations supporting Octopus Binding.

228