MDPWS Features

# General

General MDPWS optional requirements. None of them are mandatory and don’t need to be mandatory in order to be interoperable.

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| Index | Feature | Reference | Text |
| ~~GEN-1~~ | SOAP-over-UDP messaging | R0002 | A SERVICE MAY reject a SOAP ENVELOPE received over UDP that has more than MAX\_ \_UDP\_ENVELOPE\_SIZE octets if it is received via the discovery port. Otherwise, it SHOULD NOT be rejected. |
| ~~GEN-2~~ | SOAP-over-UDP messaging | R0003 | A CLIENT MAY reject a SOAP ENVELOPE received over UDP that has more than MAX\_ \_UDP\_ENVELOPE\_SIZE octets if it is received via the discovery port. Otherwise, it SHOULD NOT be rejected. |
| ~~GEN-3~~ | SOAP-over-HTTP messaging | R0006 | A SERVICE SHOULD NOT send a TEXT SOAP ENVELOPE with more than MAX\_LARGE\_ENVELOPE\_SIZE octets. |
| ~~GEN-4~~ | Service Description | R0012 | If a HOSTED SERVICE receives a MESSAGE that is inconsistent with its WSDL description, the HOSTED SERVICE SHOULD generate a SOAP Fault with a Code Value of "Sender", unless a "MustUnderstand" or "VersionMismatch" Fault is generated. |

# Streaming

Streaming is a feature of MDPWS to allow sending waveform streams via UDP multicast. Streaming is an optional feature that is not recommended to be used as the data is conveyed using an unsecured channel, and securing the channel requires extra, non-standard-conforming efforts (establishing a shared key between participants in the UDP multicast cast group). If streaming needs to be supported, every ICS statement except for STRM-4 should be made mandatory.

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| Index | Feature | Reference | Text |
| STRM-1 | SOAP-over-UDP messaging | R0002 | A SERVICE MAY reject a SOAP ENVELOPE received over UDP that has more than MAX\_ \_UDP\_ENVELOPE\_SIZE octets if it is received via the discovery port. Otherwise, it SHOULD NOT be rejected. |
| STRM-2 | SOAP-over-UDP messaging | R0003 | A CLIENT MAY reject a SOAP ENVELOPE received over UDP that has more than MAX\_ \_UDP\_ENVELOPE\_SIZE octets if it is received via the discovery port. Otherwise, it SHOULD NOT be rejected. |
| STRM-3 | Message sequencing | R0027 | If the AppSequence header from [WS-Discovery] is used to establish MESSAGE sequence numbering, the SequenceId attribute SHOULD be set to the wsa:action URI of the transmitted MESSAGE and the MessageNumber attribute SHALL be incremented by 1. |
| ~~STRM-4~~ | Ability of dereferencing target namespace | Clause 8.2 | ATTRIBUTE defines the namespace affiliation of the Stream Types declared within the StreamDescriptions. Its value SHALL be an absolute IRI [RFC 3987]. It SHOULD be dereferenceable . |

# Safe data transmission

Safe data transmission pertains to single-fault safety and safety contexts. Safe data transmission is an optional feature that requires implementations to process and expose XML on their APIs, hence it is recommended to only be used in very specific scenarios with pre-defined attribution. If dual-channel (single-fault safety) is used, SAFE-2 and SAFE-3 ought to be mandatory.

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| Index | Feature | Reference | Text |
| ~~SAFE-1~~ | Safety Requirements Advertising | R0029 | A DEVICE SHOULD indicate its feature support of clause 9 of this standard by including the SafetyReqAssertion within its WSDL. |
| SAFE-2 | Representation Generation Algorithms | R0036 | A DEVICE SHOULD support mdpws:HexSHA1 if safety-related transmission with a second channel is required. |
| SAFE-3 | Transformation Algorithms | R0039 | A DEVICE SHOULD support mdpws:xml-exc-c14n if safety-related transmission with a second channel is required. |

# Compact Representation

An efficient representation of XML is called EXI. EXI is an optional feature, potentially being a candidate for effective and efficient compression. Unfortunately, there is barely any support for EXI in the market and a custom implementation comes at tremendous costs. Hence, it is not recommended to use EXI, but rather switch to gzip or LZ4 which can be negotiated by means of HTTP. HTTP-based compression is not XML-aware and hence XML needs to be serialized first, then to be compressed, whereas EXI instantly generates a compressed data stream from XML infosets.

If EXI is used, CP-1 and CP-2 are completely free to support or not as this only affects the resulting compression rate.

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| Index | Feature | Reference | Text |
| CP-1 | EXI | R0022 | If a DEVICE supports EXI, then it SHOULD support schema-informed EXI streams with compressed option set to true and default values for the other Options [EXI10]. |
| CP-2 | EXI | R0023 | If a CLIENT supports EXI, then it SHOULD support schema-informed EXI streams with compressed option set to true and default values for the other Options [EXI10]. |

# Secured Discovery

WS-Discovery comes with a mode that supports message integrity, called compact signatures. Compact signatures facilitate participants to trust any information that is received over multicast. However, computing compact signatures is expensive and hence might be out of scope for resource constrained devices. Compact signature should never be a mandatory feature.

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| Index | Feature | Reference | Text |
| ~~SEC-1~~ | Security of Probe MESSAGEs | R0015 | A DEVICE SHOULD support receiving and responding to a Probe SOAP ENVELOPE over HTTP using a SECURE CHANNEL. |