

Payload Codec Proto - Spec Completeness Audit

Generated: 2026-02-19 11:15

Summary

Metric	Python	Go	Total
Tests Passing	401	49	450
Features Complete	31/31	31/31	31/31
Requirements Traced	70	—	70

Python Interpreter Tests

Feature	Status	Tests
integer_types	PASS	13
float_types	PASS	13
bool_type	PASS	8
bytes_type	PASS	10
string_type	PASS	9
enum_type	PASS	7
mult_modifier	PASS	6
div_modifier	PASS	4
add_modifier	PASS	2
lookup_modifier	PASS	5
polynomial	PASS	3
compute	PASS	15
guard	PASS	2
transform	PASS	2
ref	PASS	6
switch_match	PASS	20
flagged	PASS	7
bitfield	PASS	7
bitfield_string	PASS	4
byte_group	PASS	3
tlv	PASS	6
nested_object	PASS	7
repeat	PASS	10
ports	PASS	2
definitions	PASS	2
var	PASS	4
skip	PASS	3
endian	PASS	17
unit	PASS	2
semantic	PASS	6
formula	PASS	10

Go Interpreter Tests

Test	Status
TestBenchmarkResults	PASS
TestDecodeUint	PASS
TestDecodeSint	PASS
TestDecodeBits	PASS
TestCompactFormat	PASS
TestSchemaBasic	PASS
TestSchemaWithModifiers	PASS
TestSchemaWithLookup	PASS
TestSchemaWithNestedObject	PASS
TestSchemaWithMatch	PASS
TestSchemaWithVariable	PASS
TestFloat16	PASS
TestBufferUnderflow	PASS
TestTLVSimple	PASS
TestTLVCompositeTag	PASS
TestBytesHex	PASS
TestBytesHexUpper	PASS
TestBytesWithSeparator	PASS
TestBytesBase64	PASS
TestByteArray	PASS
TestRepeatCount	PASS
TestRepeatUntilEnd	PASS
TestRepeatWithVariable	PASS
TestEncodeBasic	PASS
TestEncodeWithModifiers	PASS
TestEncodeWithDiv	PASS
TestEncodeWithLookup	PASS
TestEncodeLittleEndian	PASS
TestRoundTrip	PASS
TestPortBasedSelection	PASS
TestBitfieldStringHex	PASS
TestBitfieldStringDecimal	PASS
TestFlaggedAllGroups	PASS
TestFlaggedPartialGroups	PASS
TestCrossFieldFormula	PASS
TestFormulaWithX	PASS
TestModifierYAMLKeyOrder	PASS
TestModifierYAMLKeyOrderRoundtrip	PASS
TestAlbedoFormula	PASS
TestEncodeFlaggedAllGroups	PASS
TestEncodeFlaggedBatteryOnly	PASS
TestEncodeBitfieldString	PASS
TestEncodePortBased	PASS
TestEncodeFlaggedRoundtrip	PASS
TestPolynomialEvaluation	PASS
TestComputeDiv	PASS
TestComputeMul	PASS
TestGuardWithConditions	PASS
TestRefWithTransform	PASS

Go Test Summary: 49 tests, 0 failures

Requirements Traceability

Data Types

- REQ-Unsigned-I-001: Unsigned integer types
- REQ-Signed-Int-002: Signed integer types
- REQ-Type-Alia-003: Type aliases (uint8, int8, etc.)
- REQ-Float-Typ-007: 32-bit float
- REQ-Float-Typ-008: 64-bit float
- REQ-Boolean-Ty-016: Boolean type
- REQ-Bytes-Type-017: Raw bytes type
- REQ-String-Type-018: String type
- REQ-ASCII-Type-019: ASCII string type
- REQ-Hex-Type-020: Hex string output
- REQ-Skip-Type-021: Skip/padding type
- REQ-Base64-Typ-057: Base64 encoding

Bitfields

- REQ-Bitfield-009: Bitfield extraction
- REQ-Bitfield-010: Bitfield range syntax
- REQ-Bitfield-011: Bitfield from multi-byte
- REQ-Bitfield-012: Bitfield signed extraction
- REQ-Bitfield-013: Bitfield consume behavior
- REQ-Bitfield-014: Bitfield edge cases
- REQ-Bitfield-String-069: Bitfield string output
- REQ-Consume-Fi-015: Consume field behavior
- REQ-Byte-Group-037: Byte group construct

Modifiers

- REQ-Arithmeti-022: Arithmetic modifiers
- REQ-Modifier-O-023: Modifier ordering
- REQ-Mult-Modi-024: Multiply modifier
- REQ-Add-Modif-025: Add modifier
- REQ-Div-Modif-026: Divide modifier
- REQ-Lookup-Ta-027: Lookup table modifier
- REQ-Transform-001: Transform pipeline

Computed Fields

- REQ-Formula-Fi-028: Formula field (deprecated)
- REQ-Polynomial-001: Polynomial evaluation
- REQ-Compute-001: Compute operations
- REQ-Guard-001: Guard conditions
- REQ-Encode-Formula-063: Formula encoding

Conditional Parsing

- REQ-Match-Cond-030: Match conditional
- REQ-Match-Sing-032: Match single value
- REQ-Match-List-033: Match value list
- REQ-Match-Rang-034: Match value range
- REQ-Match-Defa-035: Match default case
- REQ-Match-Defa-036: Match fallthrough

Structures

- REQ-Nested-Obj-029: Nested objects

- REQ-Enum-Type-038: Enum type
- REQ-Enum-Value-039: Enum value mapping
- REQ-Definitio-051: Definitions section
- REQ-Ref-Field-052: \$ref field references
- REQ-Variables-070: Variable storage

Repeat/Arrays

- REQ-Repeat-Coun-064: Count-based repeat
- REQ-Repeat-Byte-065: Byte-length repeat
- REQ-Repeat-Uni-066: Until-end repeat
- REQ-Repeat-Mini-067: Min/max constraints
- REQ-Repeat-Vari-068: Variable-based count

Endianness

- REQ-Endiannes-004: Big endian default
- REQ-Endiannes-005: Little endian option

Output Formats

- REQ-Output-For-040: Output formatting
- REQ-IPSO-Outpu-041: IPSO/LwM2M output
- REQ-SenML-Outpu-042: SenML output
- REQ-TTN-Output-043: TTN v3 output
- REQ-Unit-Annot-071: Unit annotations

Encoding

- REQ-Encoder-Re-044: Encoder requirements
- REQ-Roundtrip-045: Decode/encode roundtrip

Schema Document

- REQ-Document-S-SHAL-003: Schema format
- REQ-Document-S-REQU-004: Required fields
- REQ-Document-S-REQU-008: Test vectors

Special Features

- REQ-Timestamp-ISO-060: ISO timestamp
- REQ-Timestamp-Elapsed-061: Elapsed time
- REQ-Version-String-062: Version string parsing

Notes

- **Python Interpreter:** `tools/schema_interpreter.py` - 401 tests
- **Go Interpreter:** `go/schema/schema.go` - 49 tests
- **Total Coverage:** 450 tests across both implementations
- All requirements traced via `REQ-*` tags in test docstrings