Certification Test Requirements

For Conformance with the Standard Spectrum Resource Format (SSRF)

Introduction

The Standard Spectrum Resource Format (SSRF) defines as set of standardized data elements for automated exchange of radio-frequency (RF) spectrum-related data. SSRF is managed under the authority of DOD Directive 5100.35, and the Military Command, Control, Communications, and Computers Executive Board (MC4EB). The SSRF specification is in the public domain and is royalty-free and license-free.

This document describes a minimum set of requirements that a software implementation must demonstrate to conform with the SSRF specification.

Purpose

SSRF is a flexible data formatting and exchange specification. To promote system and service interoperability and compatibility all software implementations of the SSRF specification must, at minimum, produce (write) and accept (read) valid SSRF XML documents.

There are two primary categories of SSRF XML document validation:

- Document Format
    - Validates that the SSRF document is well formed XML and passes all standard XML schema validation checks using the SSRF XML Schema Definition (XSD) document.
- Document Semantics
    - Validates that, within a SSRF Document, all Datasets are correctly configured according to the SSRF XML Schema Definition (XSD) and specification document.

Certification Test Procedures

SSRF certification includes the application of four tests against all primary SSRF Datasets identified in the Appendix. These four tests characterize a maximum and minimum configuration, each with valid and invalid data.

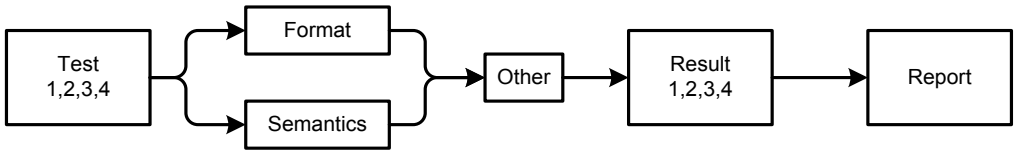
Test 1: Minimum configuration / Valid data

Test 2: Minimum configuration / Invalid data

Test 3: Maximum configuration / Valid data

Test 4: Maximum configuration / Invalid data

Each test incorporates a minimum of two procedures: first to validate document format and second to validate document semantics. For each test configuration the following general procedures must be followed; other configuration-specific tests may be added and are are noted below under each respective section. This general procedure is illustrated below.



Procedure A: Validate Document Format

SSRF XML document format validation includes the following two evaluations plus any others identified in the test definitions.

- Numeric format patterns
    - Confirm that all numeric data is correctly formatted
    - Check the total number of digits, the digits before and after the decimal point, and zero padding
- String format patterns
    - Confirm that all string Data Items conform to specification regular-expression patterns, if required.
    - Check character count, pattern composition, case, and punctuation
    - Confirm that all string Data Item lengths are within the allowed maximum and minimum lengths, inclusive

Procedure B: Validate Document Semantics

SSRF XML document semantics validation includes the following two evaluations plus any others identified in the test definitions.

- Required data elements
    - Confirm that all required Data Items are not null and are not empty
- Enumerated types
    - Confirm that the correct enumerated types are used where required
    - Where not required confirm that a best effort is made to use enumerated types
- Names
    - Confirm that Data Item names begin with an uppercase letter and Attribute names begin with a lowercase letter
- Data Items and Attributes
    - Confirm that Attributes are not presented as Data Items, or vice-versa
- Schema Validation
    - Confirm that the XML document conforms with the SSRF schema XSD document

SSRF Certification Tests

SSRF software implementations must successfully pass a minimum of four validation tests on all primary SSRF Datasets to receive certification. Primary SSRF Datasets are listed in the Appendix.

Test 1: Minimum Fill Positive Test

In this test a SSRF XML document is produced containing ONE primary Dataset with a recursive minimum-fill configuration.

A minimum-fill configuration only includes required Data Items; no optional Data Items should be present. In each included Data Item only the required fields are configured. Optional fields should be left null or empty. Required fields must be configured with valid data.

The following tests are then executed.

- Validate document format
- Validate document semantics

Test 2: Minimum Fill Negative Test

In this test a a SSRF XML document is created containing ONE primary Dataset with a recursive minimum-fill configuration in a fashion similar to the *Minimum Fill Positive Test*.

Within the Dataset each required Data Item is iteratively removed and the resultant XML document is tested. Only one Data Item is tested at a time.

The following tests are then executed.

- Validate document format
- Validate document semantics
    - Also: Correctly identify the missing required Data Item

Test 3: Maximum Fill Positive Test

In this test a SSRF XML document is produced containing ONE primary Dataset with a recursive maximum-fill configuration. In a maximum-fill configuration all Data Items within a Dataset are configured to their maximum allowed size and value.

The following tests are then executed.

- Validate document format
- Validate document semantics

Test 4: Maximum Fill Negative Test

In this test a SSRF XML document is created containing ONE primary Dataset with a recursive maximum-fill configuration in a fashion similar to the *Maximum Fill Positive Test*. Within the Dataset each Data Item is iteratively configured with an incorrect enumerated value, formatted string, too long text or invalid regular expression syntax.

The following tests are then executed.

- Validate document format
    - Also: Correctly identify and characterize the invalid data
- Validate document semantics

Appendix

Primary Datasets: SSRF v3.1.0

SSRF v3.1.0 software implementations must successfully pass (at minimum) all four validation tests for each primary Dataset to receive certification.

The 25 primary Datasets in the SSRF v3.1.0 specification are:

1. Administrative
2. Allotment
3. Antenna
4. Assignment
5. ChannelPlan
6. Contact
7. ExternalReference
8. FEDeployment
9. ForceElement
10. IntfReport
11. JRFL
12. Loadset
13. Location
14. Message
15. Note
16. Organisation
17. RadiationPlan
18. Receiver
19. RFSystem
20. Role
21. Satellite
22. SSReply
23. SSRequest
24. TOA
25. Transmitter

__END