

Interface Control Document Processing Message format

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Document type	Nb WBS	Keywords
ICD	XXX	
CMMI-SVC	CM	

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SUMMARY

This ICD explains how a RS add-on and RS core application must format its external messages to communicate on the RS platform.

CHANGE LOG

Issue/Revision	Date	Change Requests	Observations
01 draft A	17/01/2022		First version
01 draft B	04/02/2022	§3	<p>Take into account remarks from reading sheets.</p> <p>Main changes :</p> <ul style="list-style-type: none"> • ERROR/WARNING message format • Specify that output fields shall be at the minimum the ones from input. • Add a extraField map
01	09/03/2022		<ul style="list-style-type: none"> • Update keyObjectStorage property name. • Remove capability to retrieve information from other storage than S3 one.
02	09/05/2022		<ul style="list-style-type: none"> • Set familyProduct values for Sentinel 2 and 3. • Take into account remarks from meeting held on the 26/04/2022 : <ul style="list-style-type: none"> ◦ storagePath description refined (bucket name defined) • Update following meeting on the 10/05/2022 : <ul style="list-style-type: none"> ◦ « productMission » is renamed « missionId » ◦ « satelliteId » is added ◦ « metadata » section added • Update §1.4 to define topic name • Update samples on last chapter.
03	13/05/2022	§1.4 §3.1 §2.1 §4	<ul style="list-style-type: none"> • Define catalog-job & catalog-event topic for RS addon • Single error/warning topic. • storagePath field updated : <ul style="list-style-type: none"> ◦ full path ◦ <mission> is now optional • Samples updated



3.1	16/05/2022	§1.4 §1.4/§2.3.2 §2.3.5 2.3.6	<ul style="list-style-type: none"> • #389: Update RS Core name in whole ICD <ul style="list-style-type: none"> ◦ Metadata Catalog -> Metadata ◦ Data Life Cycle -> DataLifeCycle • Add § DLQ RS core chain • Add § Monitoring RS core chain
4.0 draft A	29/06/2022		<ul style="list-style-type: none"> • Add field tOPdgsDate for message sent to RS core Metadata Extraction
4.0 draft B	27/07/2022		<ul style="list-style-type: none"> • Remove REEVALUATE action from allowedActions
4.0 draft C	28/07/2022	Add §2.4 & §4.3	<ul style="list-style-type: none"> • Add parameters to allow RESUBMIT action
4.0 draft D	26/08/2022	add §2.4.2	<ul style="list-style-type: none"> • Add processorVersion parameter for RS add-on execution-worker • Update message samples
4.0	26/08/2022		<ul style="list-style-type: none"> • Release 4.0
5.0 Draft A	30/08/2022	§1.4	<ul style="list-style-type: none"> • Add reference to compression-event
5.0	05/09/2022		<ul style="list-style-type: none"> • Update pattern for time S2 timeliness • Remove draft. Release for system RS v1.1

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1 GENERAL INFORMATION

1.1 DOCUMENT PURPOSE

This document describes the format of the message used by RS core components.

1.2 GLOSSARY AND ABBREVIATIONS

Term	Meaning
DPU	A Data Process Unit is a specific Process Unit that wraps a Sentinel Data Processor binaries and their static data.
PU	A Process Unit is a microservice, packaged as ready-to-be-deployed Docker, representing the simplest step that can be included into a Reference System workflow.
RS	Reference System
RS add-on	A RS add-on is an autonomous package ready for deployment on cloud on top of RS platform. It provides a Sentinel processing chain.
RS core	A RS core is a specific RS add-on. It has the same format. It is deployed in the same way. It is part of the RS platform as a core service.
SCDF	Spring Cloud Data Flow is the workflow manager for RS platform.

1.3 APPLICABLES AND REFERENCE DOCUMENTS

1.3.1 Applicable documents

Identifier	Document name	Reference	Version
[ICD1]	RS add-on ICD	COPRS-ICD-ADST-001133963	5.0
[ICD2]	RS core ICD	COPRS-ICD-ADST-001139201	5.0

1.3.2 Reference documents

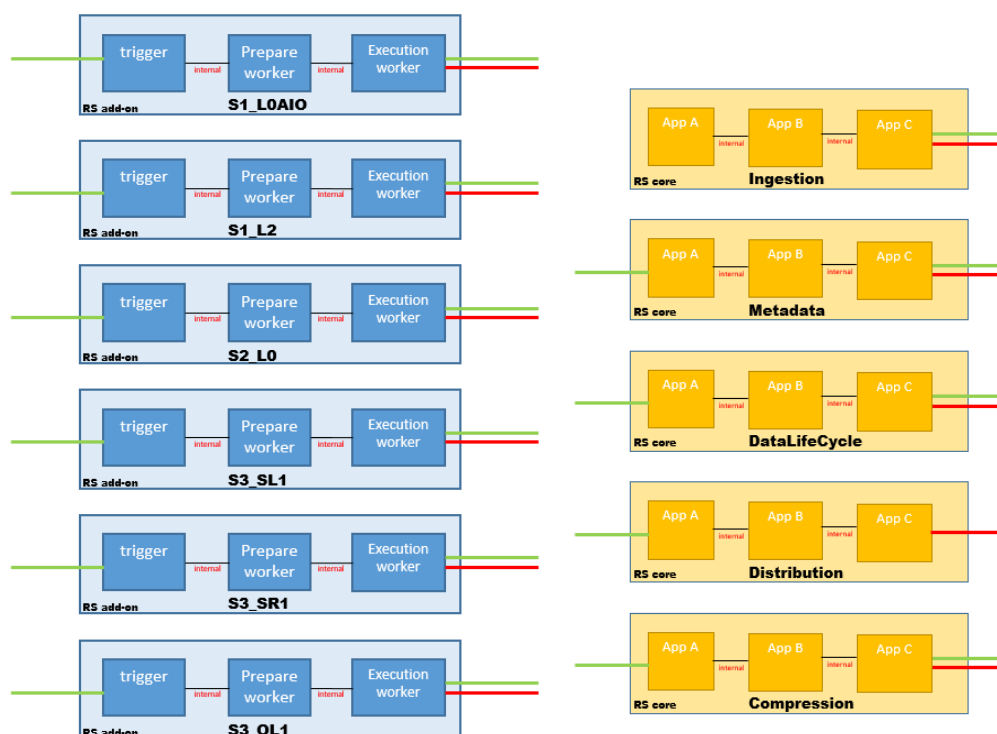
N/A

1.4 RS ADD-ON AND RS CORE

This document defines the message format exchanged between SCDF chains. It concerns messages going into the three following elements :

- RS core chains
- RS add-on chains

The shema below presents the RS core chains and some RS add-on ones and the topic.



The messages described in this document are the ones that are transiting into **GREEN (nominal)** and **RED (error and warning)** links.

All RS add-on shall read input on topic : **catalog-event**.

All RS core shall read input on topics : **catalog-event, compression-event**

All RS add-on and RS core shall write output on topics : **catalog-job** and **error-warning**.

2 NOMINAL MESSAGE FORMAT

Each message is in JSON format. They are composed from a common part and a specific part.

2.1 COMMON PART

The table below shows items for all nominal messages (some items are facultative). i.e the messages sent through **GREEN** links.

Key	Description	Mandatory	Value sample	Format
uid	unique event identifier	YES	"34995e37-196c-4332-8075-c6c6891a69cc"	String Length: 36 characters Pattern: [0-9a-fA-F]{8}\-[0-9a-fA-F]{4}\-[0-9a-fA-F]{4}\-[0-9a-fA-F]{4}\-[0-9a-fA-F]{12} Randomly generated for each new event
creationDate	Date of the message creation.	YES	"2021-02-22T16:19:04.707Z"	UTC date Pattern: <YYYY>-<MM>-<DD>T<hh>:<mm>:<ss>.<microseconds>Z
missionId	Sentinel Mission name.	YES	"S2"	String Length : Uppercase. Maximum 2 characters Pattern: "S1" "S2" "S3" "" We let the possibility of an empty chain in case the mission is unknown. This must be avoided.
satelliteId	Sentinel satellite identifier	YES	"B"	String Length : Uppercase. Maximum 1 character. Pattern: "A" "B" "C" "D" "" We let the possibility of an empty chain in case the satellite is unknown. This must be avoided.
keyObjectStorage	Key to identify a processing item (product, aux file, etc...). Basically it is a filename.	YES	"S1_AUX_ICE_V20210112T120000_G20210113T044311.SAFE.zip"	String Length between 0 and 512 characters
storagePath	Object storage URL. This is a full path to retrieve the element.	YES	"s3://rs-s3-aux-zip/S1_AUX_TR O_V20220412T120000_20220412T175959.zip" "s3://rs-session-files/S1B_20200120162933019903/DCS_01_S1B_20200120162933019903_ch2_DSDB_00005.raw"	String Length between 0 and 512 characters Pattern : s3://rs-(<mission>-)<type><extension>/product_name <mission> (optional) : "s1" "s2" "s3" Each time it is possible, the mission shall be set. <type> : "aux" "aux-zip" "l0" "l0-zip" "l1" "l1-zip" "l2" "l2-zip" "" "" "" <extension> : "c" ""

Key	Description	Mandatory	Value sample	Format
productFamily	The family product	YES	<p>Sentinel-1 sample :</p> <p>"LO_SEGMENT", "SPP_OBS", "SPP_OBS_ZIP"</p> <p>Multi sentinel sample :</p> <p>"AUXILIARY_FILE_ZIP",</p>	<p>String</p> <p>Length : maximum 32 characters</p> <p>Pattern: Uppercase, snake notation</p> <p>Non mission specific :</p> <p>"AUXILIARY_FILE", "EDRS_SESSION", "PLAN_AND_REPORT", "AUXILIARY_FILE_ZIP", "BLANK", "XBIP_SESSION"</p> <p>Sentinel-1 specific:</p> <p>"LO_SLICE", "LO_ACN", "LO_BLANK", "L1_SLICE", "L2_SLICE", "L1_ACN", "L2_ACN", "LO_SEGMENT", "LO_REPORT", "L1_REPORT", "L2_REPORT", "LO_SEGMENT_REPORT", "SPP_OBS", "SPP_MBU", "LO_ACN_ZIP", "LO_BLANK_ZIP", "LO_SEGMENT_ZIP", "LO_SLICE_ZIP", "L1_ACN_ZIP", "L1_SLICE_ZIP", "L2_ACN_ZIP", "L2_SLICE_ZIP", "SPP_OBS_ZIP"</p> <p>Sentinel-2 specific: S2_LOU_DS, S2_LOC_DS, S2_L1A_DS, S2_L1B_DS, S2_L1C_DS, S2_L2A_DS, S2_LOU_GR, S2_LOC_GR, S2_L1A_GR, S2_L1B_GR, S2_L1C_GR, S2_L2A_GR, S2_L1C_TCI, S2_L2A_TCI, S2_HKTM, S2_SAD, S2_AUX</p> <p>Sentinel-3 specific: S3_AUX, S3_GRANULES, S3_LO, S3_L1_NRT, S3_L1_STC, S3_L1_NTC, S3_L2_NRT, S3_L2_STC, S3_L2_NTC, S3_CAL, S3_PUG, S3_JOB, S3_AUX_ZIP, S3_GRANULES_ZIP, S3_LO_ZIP, S3_L1_NRT_ZIP, S3_L1_STC_ZIP, S3_L1_NTC_ZIP, S3_L2_NRT_ZIP, S3_L2_STC_ZIP, S3_L2_NTC_ZIP, S3_CAL_ZIP, S3_PUG_ZIP</p>
podName	The POD that has created the message.	YES	"s1pro-compression-worker-10"	<p>String</p> <p>Length : maximum 64 characters</p>
allowedActions	Actions allowed on an event after a failed processing or a processing that ends with a warning.	YES	["RESUBMIT", "RESTART"]	<p>Array</p> <p>Number of elements : 0 to 3.</p> <p>Element possible : "RESUBMIT", "RESTART", "NO_ACTION"</p>
retryCounter	Number of retries for this event. The value is equal to 0 for the first time.	YES	2	<p>Integer</p> <p>Positive value</p> <p>Value between 0 and 64</p>
additionalFields	Additional parameters that are specific to the service.	YES	{ "parameter_1": "value1", "parameter_1": "value2" }	<p>Nested JSON format</p> <p>Length : maximum 8192 characters</p>
metadata	Metadata information	NO	{ "parameter_1": "value1", "parameter_1": "value2" }	<p>Nested JSON format</p> <p>Length : maximum 8192 characters</p> <p>This section is used to send additional information to the Catalog RS core.</p>
demandType	Processing workflow follow-up	NO	"NOMINAL"	<p>String</p> <p>Pattern : "NOMINAL" "EXTERNAL_DEMAND" "EXTERNAL_CUSTOM_DEMAND" "OPERATOR_DEMAND"</p> <p>By default, the demand type is equal to "NOMINAL".</p>

Key	Description	Mandatory	Value sample	Format
debug	Debug mode.	NO	"true"	Boolean Pattern : "true" "false" Default value is "NO".
oqcFlag	Amalfi status.	NO	"CHECKED_OK"	String Pattern : "CHECKED_OK" "CHECKED_NOK" "NOT_CHECKED" Default value is "NOT_CHECKED".
timeliness	Product timeliness	NO	"FAST24"	String. Uppercase. Pattern : "" "NRT" "PT" "FAST24" "OPERATOR-DEMAND" "NTC" "STC" "S2_SESSION" "S2_LO" "S2_L1" "S2_L1" "" Default value is "". i.e.. not timeliness is relevant for that event.

2.2 MESSAGE CONSISTENCY

Each output message from a RS add-on / Rs core chain shall have at the minimum all the fields present on the input message.

This feature is important in case the whole processing chain needs to have an element that crosses a chain without modification.

2.3 SPECIFIC PART FOR RS-CORE CHAINS

The RS core chains will use the field “additionalFields” parameter to define specific needs.

Here are the specific elements identified.

2.3.1 RS core Metadata

Key	Description	Mandatory	Value sample	Format
productSizeByte	Size in bytes of the product element.	YES	314573644	long >= 0
tOPdgsDate (with character ZERO inside)	PDGS timeliness starting date. This field is used to compute PDGS timeliness.	YES	"2021-02-22T16:19:04.707Z"	UTC date Pattern: <YYYY>-<MM>-<DD>T<hh>:<mm>:<ss>.<microseconds>Z
stationName	Station name.	NO	"WILE"	String. Max length 32 characters. UpperCase.

2.3.2 Other RS core

No specific parameter identified yet.

2.4 SPECIFIC PART FOR RS-ADD-ON CHAINS

The RS add-on chains will use the field “**additionalFields**” parameter to define specific needs.

Here are the specific elements identified.

2.4.1 Preparation-worker

The RESUBMIT action is allowed only for preparation workers. This action will restart the whole RS Add-on. If RESUBMIT is in the list of allowedAction, the following parameters are mandatory:

Key	Description	Mandatory	Value sample	Format
resubmitMessage	The content of message to be published on the resubmitTopic (to restart the RS add-on)	NO	see §4.3 example	The message shall be compliant with the common part of format
resubmitTopic	The target topic to publish the resubmit message. By default, the target topic is catalog-event	NO	"catalog-event"	String Length : maximum 64 characters

2.4.2 Execution-worker

Key	Description	Mandatory	Value sample	Format
processorVersion	Version of the ESA Sentinel Data Processor embedded in the execution-worker used to generate the product.	YES	"6.0.01"	String. Max length 16 characters. UpperCase (if letter in version).

2.4.3 Other pods

No specific parameter identified yet.

3 ERROR/WARNING MESSAGE FORMAT

The error/warning messages are produced by both :

- Processor from the RS core/add-on : in case some critical/warning problem occurred during the processing.
- SCDF framework : after 'x' failures for the same event . A failure is counted when the message is read but not acknowledged after a period of time.

There is a unique format for the error/warning message in both cases.

3.1 QUEUE

The error/warning message will be pushed into a specific mission Kafka queue named :

`error-warning`

As a prerequisite, the following SCDF parameters will be set :

`spring.cloud.stream.error-warning consumer.headerMode=embeddedHeaders`

3.2 MESSAGE CONTENT

An error / warning message (the one send through **RED** links) is composed by all items from the initial message enhanced with following parameters :

Key	Description	Mandatory	Value sample	Format
x-original-topic	The topic where the message was present.	YES	"catalog-job"	String Length : maximum 64 characters
x-exception-message	The message description.	YES	"Error on dissemination of product to outbox myocean"	String Length : maximum 512 characters
x-exception-stacktrace	The full error error stack.	YES	"java.lang.RuntimeException: Error: Number .."	String Length : maximum 2048 characters
x-original-timestamp	Date of the initial message.	YES	"2021-02-22T16:19:04.707Z"	UTC date Pattern : <YYYY>-<MM>-<DD>T<hh>:<mm>:<ss>.<microseconds>Z
errorLevel	Error level.	NO	"WARNING"	String Length : Uppercase. Maximum 16 characters Pattern : "ERROR" "WARNING" Default value is "ERROR".

Note : the four first parameters are set by SCDF Dead Letter Queue mechanism and will be repeated by the application that generates the error event. The application can also add the level "WARNING" for the message.

4 SAMPLE

4.1 NOMINAL MESSAGE

```
{
  "uid": "1c4c21ec-a308-45dc-8834-f979c8c3f8a6",
  "creationDate": "2021-02-26T11:30:09.445Z",
  "missionId": "S1",
  "satelliteId": "A",
  "keyObjectStorage": "S1A_IW_OCN__2SDV_20210225T111815_20210225T111840_036746_0451BD_37EF.SAFE",
  "storagePath": "s3://rs-session-files/S1B_20200120162933019903/DCS_01_S1B_20200120162933019903_ch2_DSDB_00005.raw",
  "productFamily": "L2 SLICE",
  "podName": "slpro-l2-ipf-execution-worker-19",
  "allowedActions": [
    "RESTART"
  ],
  "retryCounter": 2,
  "additionalFields": {
    "productSizeByte": 32000,
    "tOPdgsDate": "2021-02-26T11:30:09.445Z",
    "processorVersion": "6.0.10"
  },
  "metadata": {
    "productFamily": "EDRS_SESSION",
    "stationCode": "MTI_",
    "missionId": "S1",
    "insertionTime": "2022-05-04T05:46:50.100456Z",
    "satelliteId": "B",
    "sessionId": "S1B_20200120162933019903",
    "channelId": 2,
    "productName": "DCS_01_S1B_20200120162933019903_ch2_DSDB_00005.raw",
    "productType": "RAW",
    "url": "S1B_20200120162933019903/DCS_01_S1B_20200120162933019903_ch2_DSDB_00005.raw"
  },
  "demandType": "EXTERNAL_DEMAND",
  "debug": false,
  "qcFlag": "CHECKED_OK",
  "timeliness": "OPERATOR-DEMAND"
}
```

4.2 ERROR / WARNING MESSAGE

```
{
  "x-original-topic": "catalog-event",
  "x-exception-message": "Error on dissemination of product to outbox myocan",
  "x-exception-stacktrace": "java.lang.RuntimeException: Error: Number ..",
  "x-original-timestamp": "2021-02-26T11:30:09.445Z",
  "errorLevel": "WARNING",
  "uid": "1c4c21ec-a308-45dc-8834-f979c8c3f8a6",
  "creationDate": "2021-02-26T11:30:09.445Z",
  "missionId": "S1",
  "satelliteId": "A",
  "keyObjectStorage": "S1A_IW_OCN__2SDV_20210225T111815_20210225T111840_036746_0451BD_37EF.SAFE",
  "storagePath": "s3://rs-session-files/S1B_20200120162933019903/DCS_01_S1B_20200120162933019903_ch2_DSDB_00005.raw",
  "productFamily": "L2 SLICE",
  "podName": "slpro-l2-ipf-execution-worker-19",
  "allowedActions": [
    "RESTART"
  ],
  "retryCounter": 2,
  "additionalFields": {
    "productSizeByte": 32000,
    "tOPdgsDate": "2021-02-26T11:30:09.445Z",
    "processorVersion": "6.0.10"
  },
  "metadata": {
    "productFamily": "EDRS_SESSION",
    "stationCode": "MTI_",
    "missionId": "S1",
    "insertionTime": "2022-05-04T05:46:50.100456Z",
    "satelliteId": "B",
    "sessionId": "S1B_20200120162933019903",
    "channelId": 2,
    "productName": "DCS_01_S1B_20200120162933019903_ch2_DSDB_00005.raw",
    "productType": "RAW",
    "url": "S1B_20200120162933019903/DCS_01_S1B_20200120162933019903_ch2_DSDB_00005.raw"
  },
  "demandType": "EXTERNAL_DEMAND",
  "debug": false,
  "qcFlag": "CHECKED_OK",
  "timeliness": "OPERATOR-DEMAND"
}
```


4.3 ERROR MESSAGE WITH RESUBMITMESSAGE

```
{
  "x-original-topic": "intenal-topic",
  "x-exception-message": "Not enough memory",
  "x-exception-stacktrace": "java.lang.RuntimeException: Error: Number ..",
  "x-original-timestamp": "2021-05-20T08:30:11.125Z",
  "errorLevel": "ERROR",
  "uid": "1c4c21ec-a308-45dc-8834-f979c8c3f8a6",
  "creationDate": "2021-05-20T08:38:35.155Z",
  "missionId": "S1",
  "satelliteId": "B",
  "keyObjectStorage": "S1A_IW_OCN__2SDV_20210522T071815_20210522T111840_036746_0451BD_37EF.SAFE",
  "storagePath": "s3://rs-session-files/S1B_20220120162933019903/DCS_01_S1B_20220120162933019903_ch2_DSDB_00004.raw",
  "productFamily": "L2_SLICE",
  "podName": "rs-l2-ipf-execution-worker-19",
  "allowedActions": [
    "RESTART",
    "RESUBMIT"
  ],
  "resubmitTopic": " ",
  "resubmitMessage": {
    "uid": "1c4c21ec-a308-45dc-8834-f979c8c3f8a6",
    "creationDate": "2021-05-20T08:37:35.155Z",
    "missionId": "S1",
    "satelliteId": "B",
    "keyObjectStorage": "S1A_IW_OCN__2SDV_20210522T071815_20210522T111840_036746_0451BD_37EF.DSIB",
    "storagePath": "s3://rs-session-files/S1B_20220120162933019903/DCS_01_S1B_20220120162933019903_ch2_DSDB_00004.raw",
    "productFamily": "L2_SLICE",
    "podName": "rs-l2-ipf-preparation-worker-19",
    "allowedActions": [
      "RESTART",
      "RESUBMIT"
    ],
    "retryCounter": 2,
    "additionalFields": {
      "productSizeByte": 32000,
      "t0PdgsDate": "2021-02-26T11:30:09.445Z",
      "processorVersion": "6.0.10"
    },
    "metadata": {
      "productFamily": "EDRS_SESSION",
      "stationCode": "MTI_",
      "missionId": "S1",
      "insertionTime": "2022-05-04T05:46:50.100456Z",
      "satelliteId": "B",
      "sessionId": "S1B_20200120162933019903",
      "channelId": 2,
      "productName": "DCS_01_S1B_20200120162933019903_ch2_DSDB_00005.raw",
      "productType": "RAW",
      "url": "S1B_20200120162933019903/DCS_01_S1B_20200120162933019903_ch2_DSDB_00005.raw"
    },
    "demandType": "EXTERNAL_DEMAND",
    "debug": false,
    "qcFlag": "CHECKED_OK",
    "timeliness": "OPERATOR-DEMAND"
  }
},
{
  "retryCounter": 2,
  "additionalFields": {
    "productSizeByte": 32000,
    "t0PdgsDate": "2021-02-26T11:30:09.445Z",
    "processorVersion": "6.0.10"
  },
  "metadata": {
    "productFamily": "EDRS_SESSION",
    "stationCode": "MTI_",
    "missionId": "S1",
    "insertionTime": "2022-05-04T05:46:50.100456Z",
    "satelliteId": "B",
    "sessionId": "S1B_20200120162933019903",
    "channelId": 2,
    "productName": "DCS_01_S1B_20200120162933019903_ch2_DSDB_00005.raw",
    "productType": "RAW",
    "url": "S1B_20200120162933019903/DCS_01_S1B_20200120162933019903_ch2_DSDB_00005.raw"
  },
  "demandType": "EXTERNAL_DEMAND",
  "debug": false,
  "qcFlag": "CHECKED_OK",
  "timeliness": "OPERATOR-DEMAND"
}
```