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Dataset cancellations without dataset files

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Introduction

S-100 allows for cancellations to be issued as an instruction in the Exchange Catalogue metadata without an accompanying dataset file:

S-100 17-4.1 (text description below figure 17-2):
"…This level of flexibility is essential to properly support the mainstream use case of exchanging geospatial data, as well as the use cases for releasing dataset cancellation notices or new Catalogue releases without any data files present"

Technically this can be done by including the data file information in the exchange catalogue metadata and encode the DatasetDiscoveryMetadata attribute "purpose" (Type = S100_Purpose) with the value 5 (cancellation):

Attribute	purpose	The purpose for which the dataset has been issued	0..1	S100_Purpose

S100_Purpose

Role Name	Name	Description	Code	Remarks
Enumeration	S100_Purpose	The purpose of the dataset	-	
Value	newDataset	Brand new dataset	1	No data has previously been produced for this area
Value	newEdition	New edition of the dataset or Catalogue	2	Includes new information which has not been previously distributed by updates
Value	update	Dataset update	3	Changing some information in an existing dataset
Value	reissue	Dataset that has been re-issued	4	Includes all the updates applied to the original dataset up to the date of the re-issue. A re-issue does not contain any new information additional to that previously issued by updates.
Value	cancellation	Dataset or Catalogue that has been cancelled	5	Indicates the dataset or Catalogue should no longer be used and can be deleted
Value	delta	Dataset difference	6	Reserved for future use

Topics for discussion

A: A fileless cancellation instruction as described above is not supported by the digital signature mechanism in S-100 Part 15.

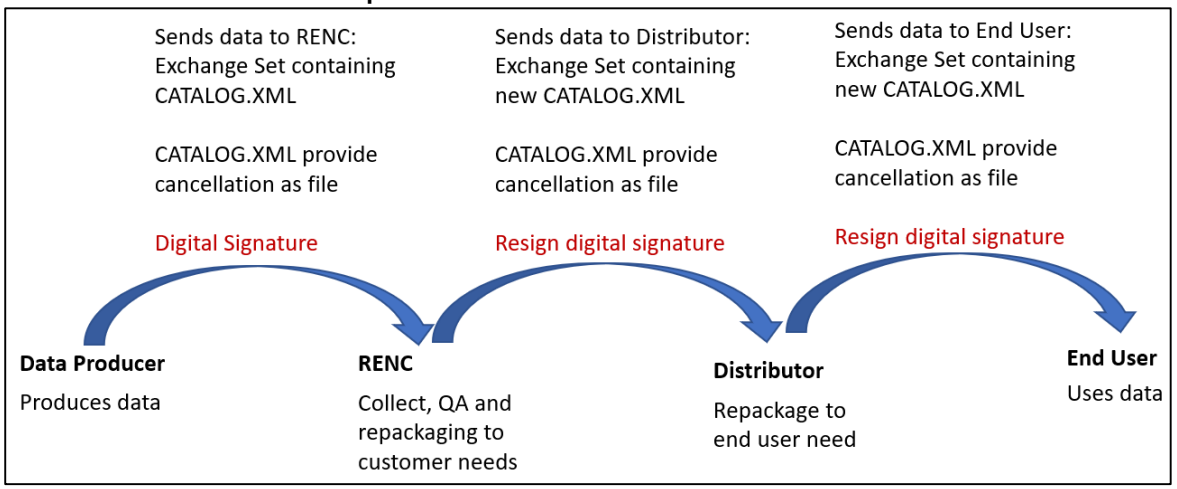
B: The cancellation will not be part of a data file life cycle as is the case for the current S-57 ENCs.

A: Fileless cancellation and digital signature

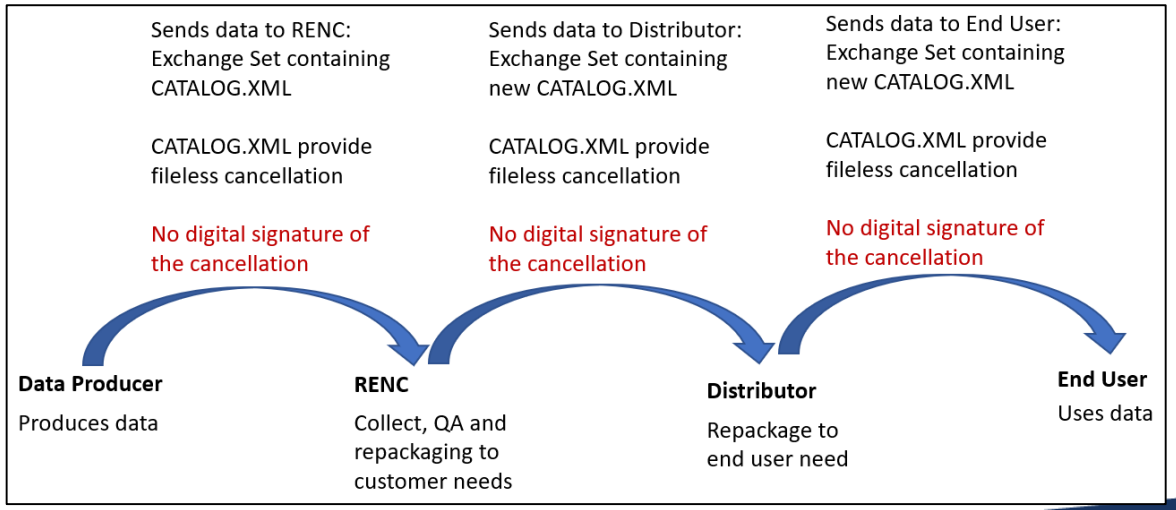
- S-100 part 15 defines a mechanism for digitally signing all the files included in an exchange set including the catalogue file. This mechanism applies to both dataset and support files
- If a cancellation transaction is issued without an accompanying dataset file (fileless cancellation), S-100 requires that all the cancellation information must be encoded in the CATALOG.XML metadata
- The cancellation instruction itself will not be signed – only the CATALOG.XML containing the instruction.
- For digital signing there is therefore a huge difference between a fileless cancellation and cancellation issued as an update

The differences

- Cancellation as update:



- Fileless cancellation:



Consequence and risk

- The consequence is that it will not be possible to trace the origins of a cancellation transaction back to the data producer since it will only contain the RENC/distributor digital signature.
- **This raises the question if this poses a security risk as it will then not be possible to verify the origin of the cancellation instruction**.
- In theory a RENC/Service Provider and Distributor could issue a cancellation instruction not being issued by a producing agency

- If considered a risk, possible solutions could be:
- S-100 Part 15 must be extended to cater for the possibility to digitally sign the cancellation instruction within the DatasetDiscoveryMetadata.
- Special instructions must be defined for how a data producer shall create cancellation updates, how RENC/Distributors shall process cancellation updates, and how end-user systems shall process cancellation updates.

Conclusion: It must be agreed upon if missing digital signing of the cancellation instruction poses a security risk, and if yes a solution must be provided.
Conclusion: If S-100 supports both options (fileless cancellation and cancellation using a data file) must be determined. Further descriptive text on cancellation guidance should be provided in Part 17.

B: Dataset life cycle

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- From a service provider viewpoint a product (data file) has a life cycle.
- This starts with the initial version of a data file in edition 1, and ends with a cancellation update after 0-n editions (and 0-n updates/reissues between each edition).
- If the fileless cancellation is to be used, the endpoint of a data file lifecycle will not be linked together with the data file itself (by issuing a cancellation update using edition nr 0 and update number as is currently done in S-57).
- Existing systems are designed around the product or data lifecycle concept established with S-57.
- The end-user systems can no longer rely on there always being an update file available to support every update transaction, this requires that the end-user system must create and record their own database update transaction. This to make sure that the file-less cancellation events are properly versioned and released in the same way as other data set version events.

Dataset life cycle

- Service providers (RENCs) creates on the fly custom made exchange sets for an end-user – and package all the relevant data/support files and create the corresponding CATALOG.XML file.
- In a fileless solution this task will be more complicated depending on if cumulative or incremental (delta) update exchange sets are to be created.
- It might be necessary to explicitly state how end-user systems, for type approval purposes, shall perform if updates are not processed sequentially, and a cancellation message is not received.
- To avoid this, it would be helpful if the exchange catalogue metadata could also include an entry for the data file adjusting update number accordingly (even though the data file itself is not present in the exchange set).

Conclusion: Consider if a fileless cancellation still could lead to an uptick in update number of the data file information in the Exchange Catalogue metadata (CATALOG.XML) - (even though the data file itself is not present in the exchange set).