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iPres 2016 - Workshop on Relational Database Preservation Standards and Tools

SIARD Format 2.0

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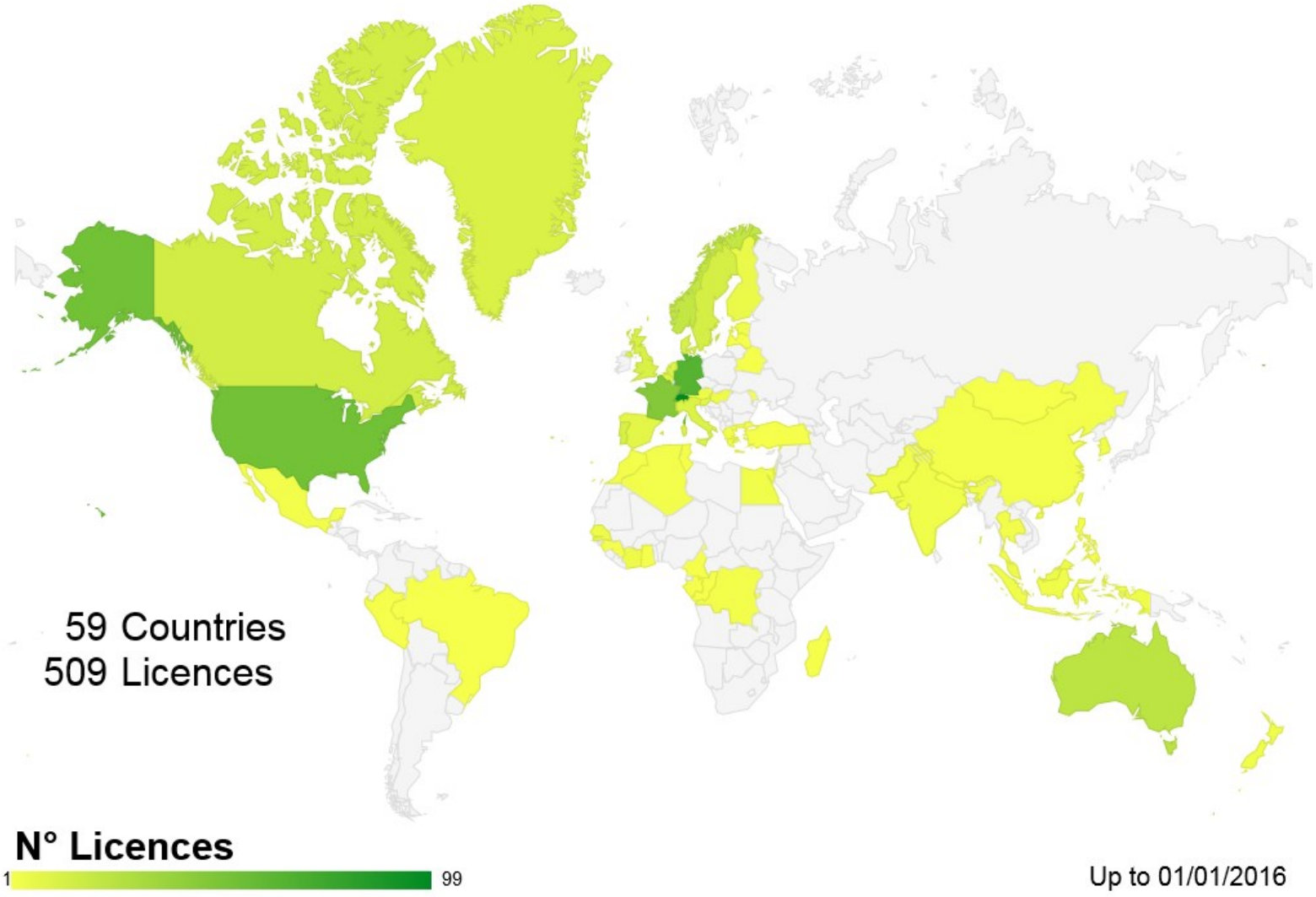
Marcel Büchler <marcel.buechler@bar.admin.ch>

SIARD usage distribution map



SIARD – what does it mean?

Software Independent Archiving of Relational Databases

- Nature of data: databases
- Type: relational databases
- Convert content into archivable format
- Detachment of data from executable applications

Why is that difficult to archive?

There exist several major database management systems, their storage formats are not compatible.
… And these systems and storage formats evolve over time!

Conclusions:

- we cannot archive proprietary storage formats
- todays storage files are almost certainly

  not readable with tomorrows applications

SIARD principles

- Preserve Information, not layout or interaction
- Preserve primary data, not code
- Preserve tables with their relations

Functionality Preservation

Constraints

Archived databases are consistent when they are created from consistent databases. Since, once archived, they will not be changed anymore, preserving constraints is not mandatory.

SIARD Format: Technical Details

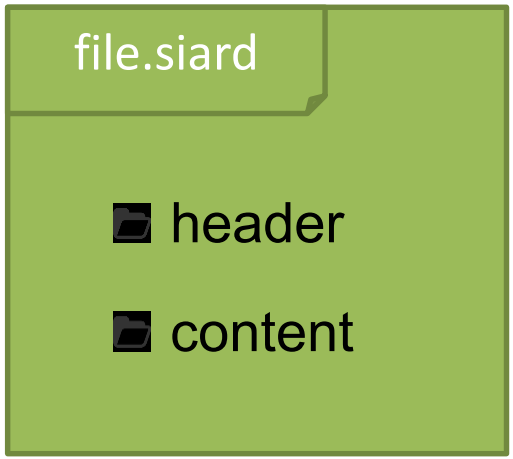
- The SIARD format saves database-content in a SIARD-file (SIARD-archive)
- A SIARD-file is an uncompressed ZIP-folder (ZIP64) which contains several XML-files
- There is a single XML-file that documents all metadata for the database content, based on SQL:1999
- The remaining XML-files contain data from the tables (the actual database content)
- The format SIARD is based on open standards: SQL:1999, XML, XML Schema, UNICODE

Structure of a SIARD file

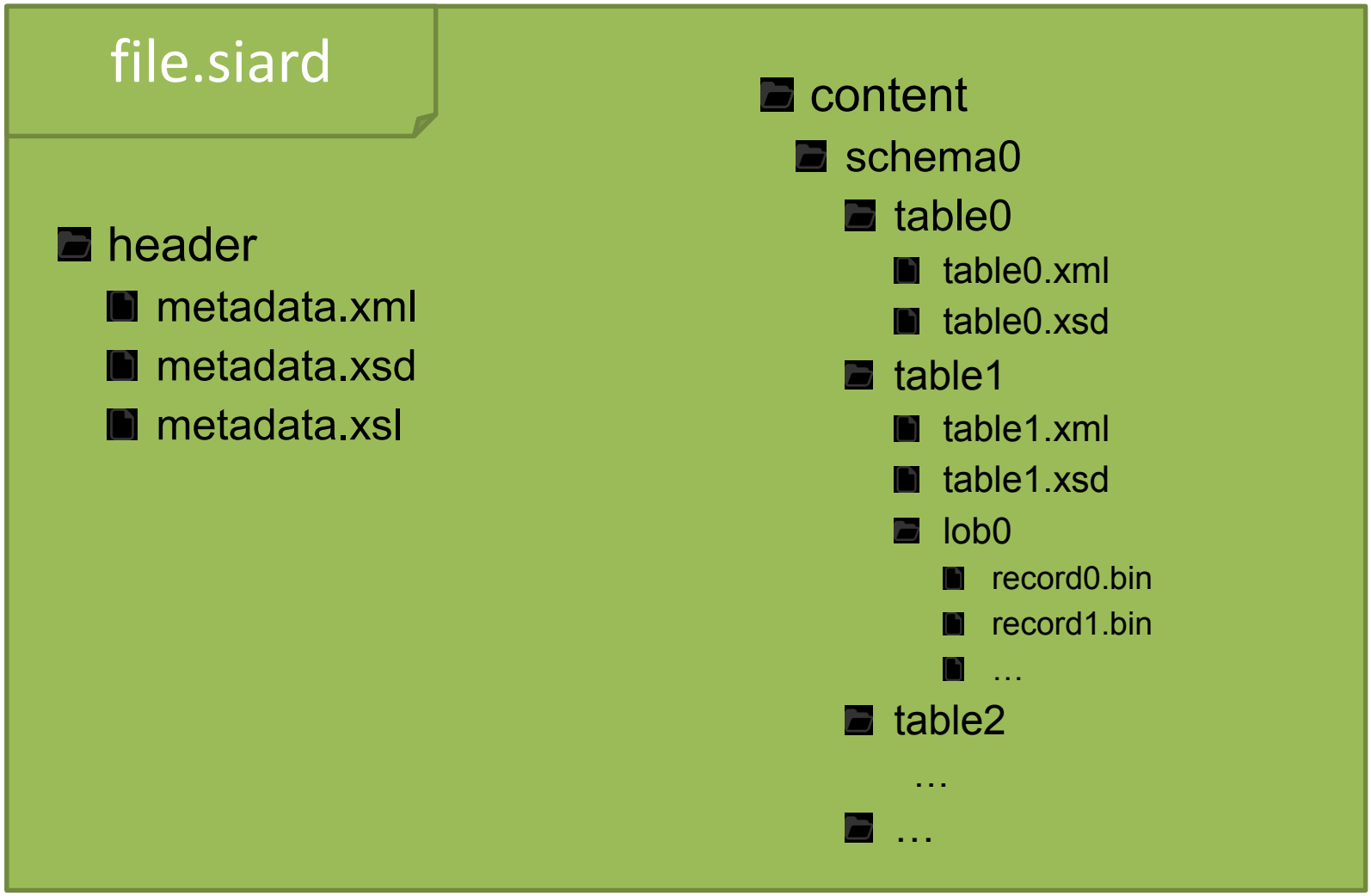
- Primary data is saved as XML in the **`content`** folder

  ➢ For each database table a separate XML file is generated

- Metadata is saved in the **`header`** folder within the **`metadata.xml`** file



Structure of a SIARD file



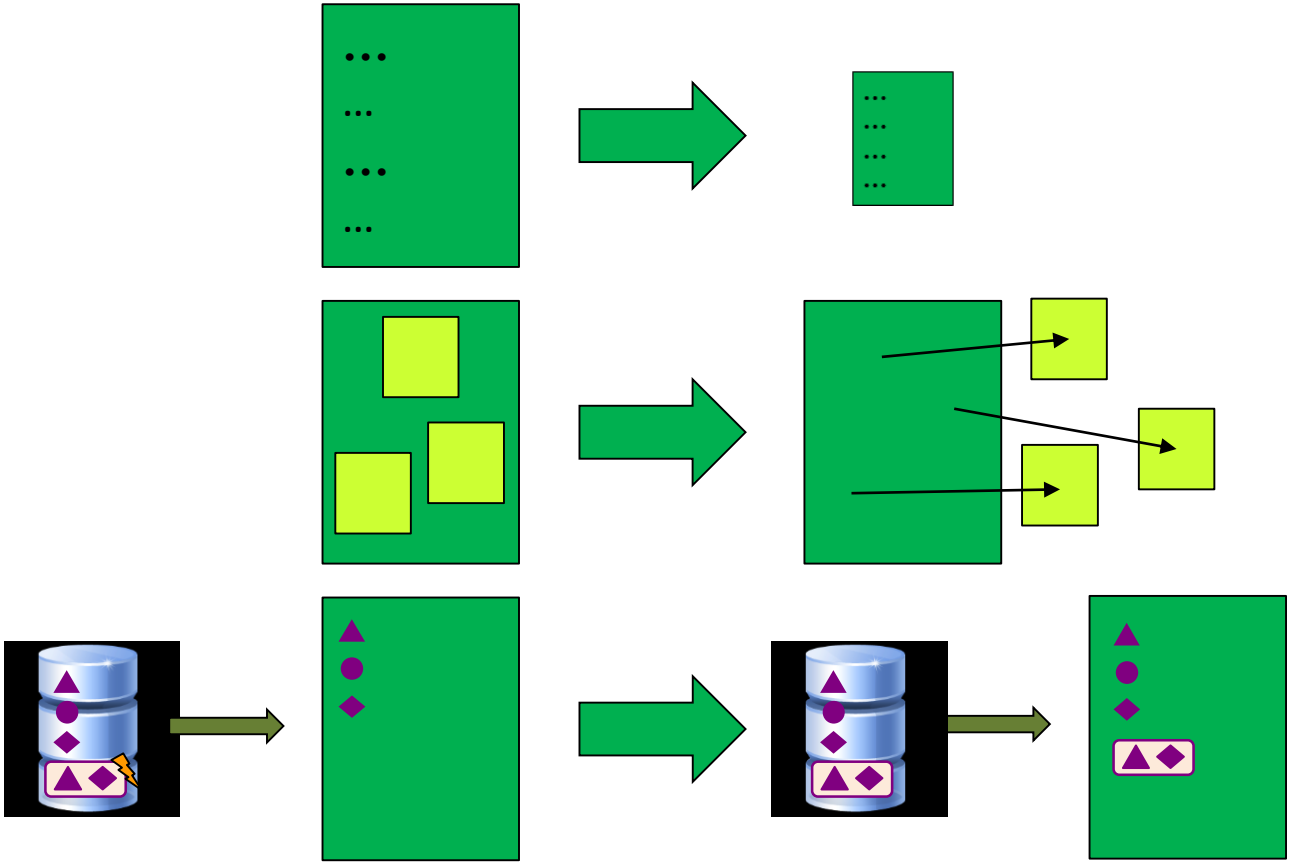
XML table data example

```
<?xml version="1.0" encoding="utf-8" ?>
- <table xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns="http://www.admin.ch/xmlns/siard/1.0/schema0/table0.xsd"
    xsi:schemaLocation="http://www.admin.ch/xmlns/siard/1.0/schema0/table0.xsd table0.xsd">
  - <row>
      <c1>1</c1>
      <c2>Boeing</c2>
      <c3>747-400</c3>
      <c4 file="content/schema0/table0/lob4/record0.bin" length="35964" />
    </row>
  - <row>
      <c1>2</c1>
      <c2>Airbus</c2>
      <c3>A330-300</c3>
      <c4 file="content/schema0/table0/lob4/record1.bin" length="13234" />
    </row>
  - <row>
      <c1>3</c1>
      <c2>Fokker</c2>
      <c3>50</c3>
      <c4 file="content/schema0/table0/lob4/record2.bin" length="44065" />
    </row>
</table>
```

New challenges

- Databases can get huge, which means the SIARD XML Files get huge too
- Everything that lived in the database is stuffed into XML-files, this makes control and preservation harder than necessary
- SIARD Format 1.0 is based on SQL:1999, which, by IT standards, one could call ancient

Our solutions



SIARD 2.0 – Changes

- Upgrade of SQL:1999 to **SQL:2008**

- Support for:
  - all SQL:2008 types, in particular **user-defined data types** (UDTs)
  - **binary or character large objects** (BLOBs and CLOBs) outside of the SIARD file using “file:” URIs
  - **deflate** as a compression mechanism

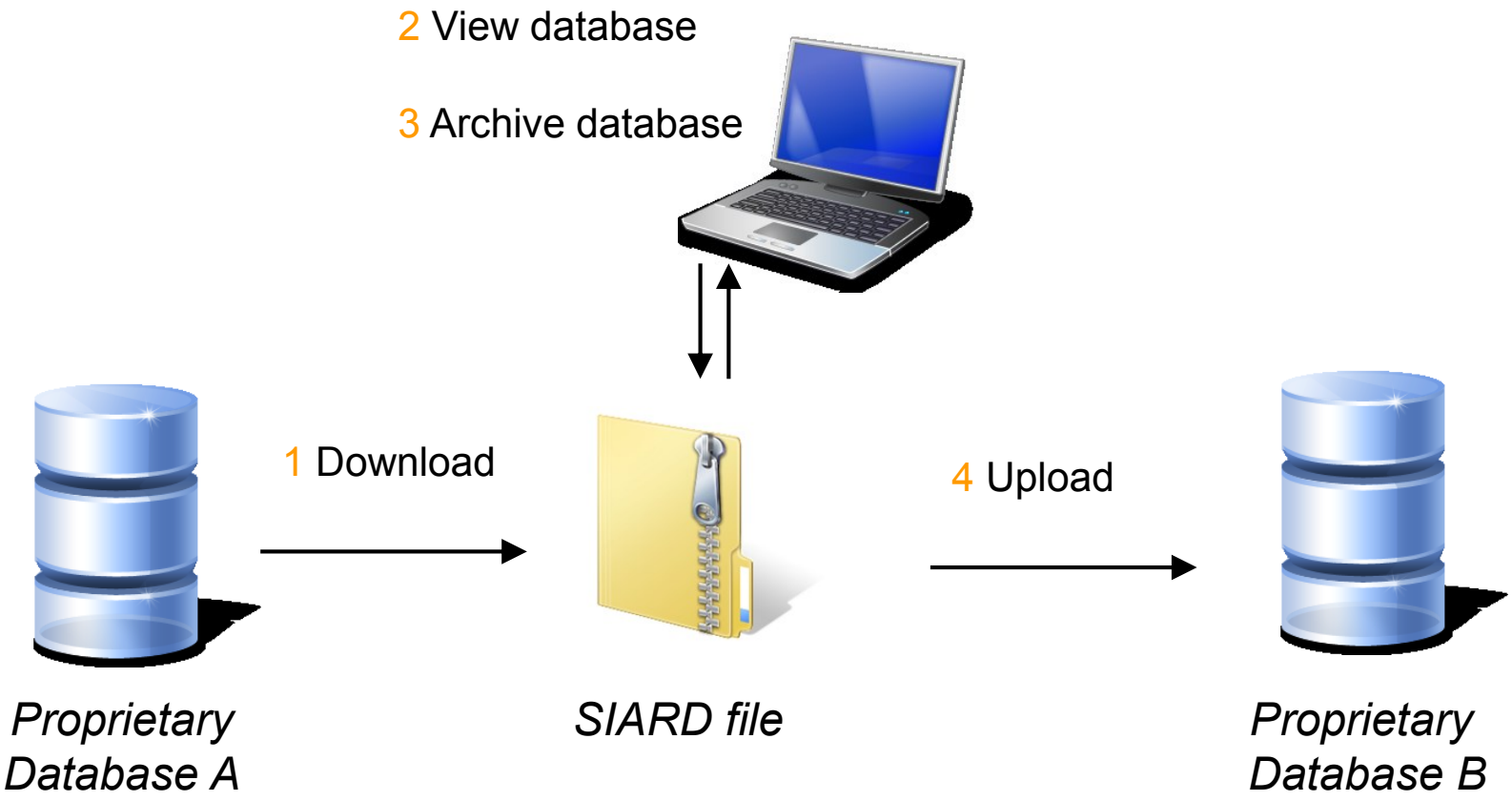
SIARD 2.0 – Benefits

- BLOBs or CLOBs can be stored outside of the XML as self-contained files. They can thus be indexed and accessed directly and more easily migrated to another format. It would also be easier to mandate specific formats (given a policy that requires external storage of binary data).

- Deflate compression minimises (expensive) storage usage.

- With user-defined data types modern databases are supported as they are; no data type conversions are needed when archiving.

Archiving Databases with SIARD



SIARD Format is an Open Standard

- eCH-Standard (eCH-0165: SIARD-Formatspezifikation)

- eARK Specification

Thank you – Merci!

Contact and questions:
Archival Custody and Solutions Services
Swiss Federal Archives SFA
marcel.buechler@bar.admin.ch

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