



Collabora Productivity

# Database migration in LibreOffice

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# Firebird vs HSQLDB

- Embedded Databases
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- Developer's point of view
- Performance
- (Why not SQLite?)

**HyperSQL**

**HSQLDB - 100% Java Database**



# Tender for a migrating tool

Import old document data by reading HSQLDB binary file-format and schema information.

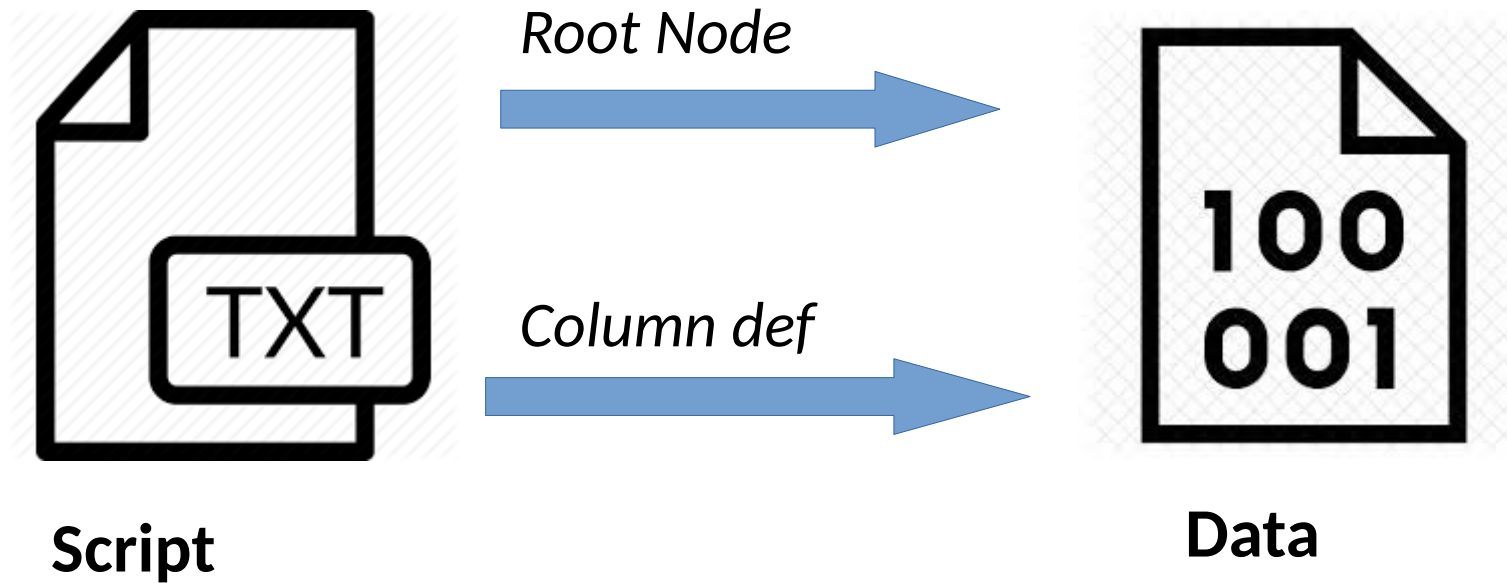
Convert data to actual sdbc implementation.

# Prerequisites

## Firebird driver improvements

- LONGVARCHAR → Clob
- BINARY (fix) and VARBINARY → (VAR)CHAR “OCTETS”
- LONGVARBINARY (Image) → Blob subtype
- Copy integer values from Calc to Base

# HSQL format

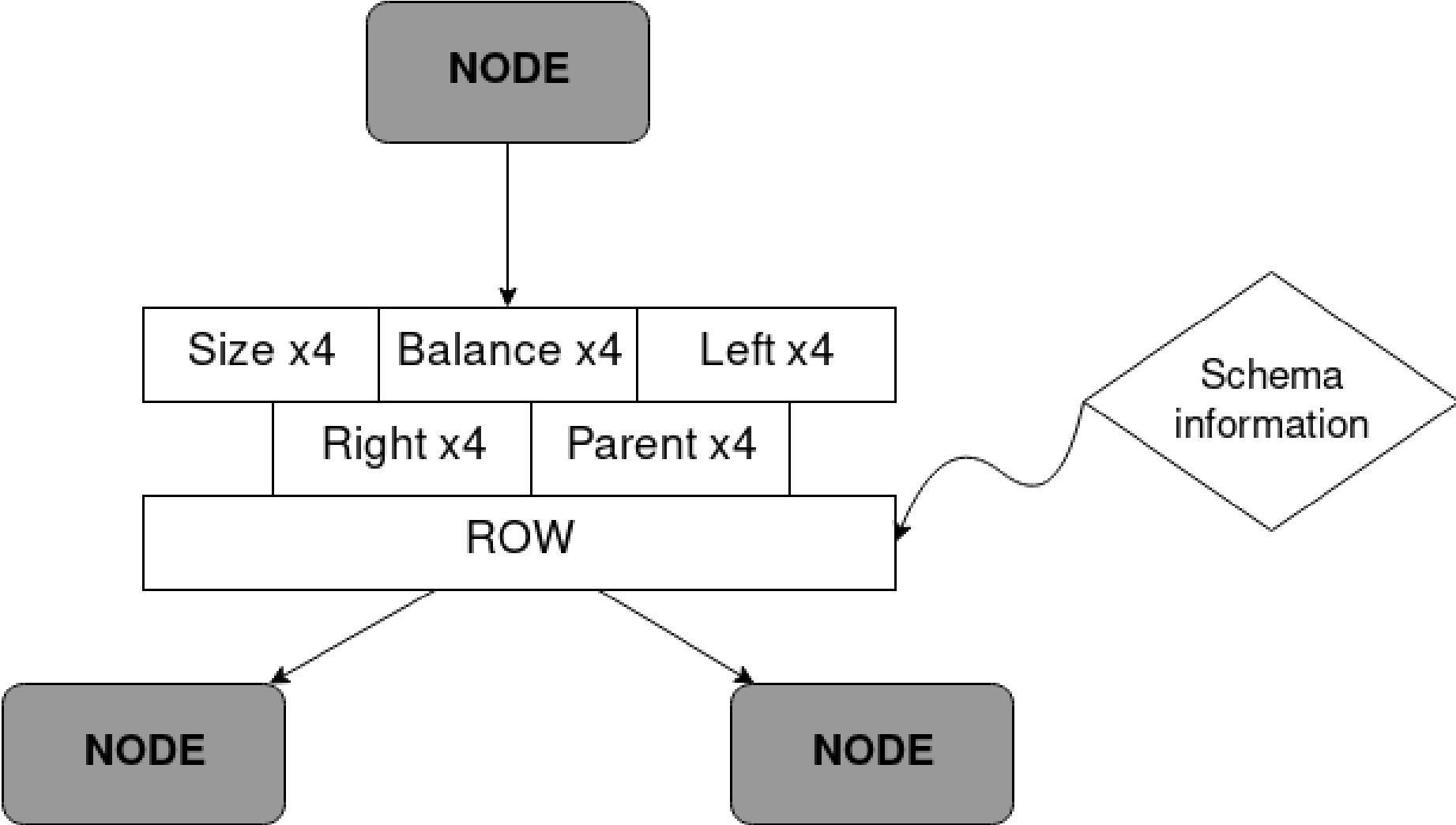


# Challenges #1 Schema definition

```
1 SET DATABASE COLLATION "Hungarian"
2 CREATE SCHEMA PUBLIC AUTHORIZATION DBA
3 CREATE CACHED TABLE "Table1"("Id" INTEGER NOT NULL PRIMARY KEY,"Name" VARCHAR(100))
4 CREATE CACHED TABLE "ClobTest"("Id" INTEGER GENERATED BY DEFAULT AS IDENTITY(START WITH 0) NOT
5 NULL PRIMARY KEY,"Doksi" LONGVARCHAR)
6 CREATE CACHED TABLE "ImageTest"("Id" INTEGER GENERATED BY DEFAULT AS IDENTITY(START WITH 0) NOT
7 NULL PRIMARY KEY,"Kep" LONGVARBINARY)
8 CREATE CACHED TABLE "Table2"("Id" INTEGER NOT NULL PRIMARY KEY,"Binaris" BINARY)
9 CREATE CACHED TABLE "Table3"("ID" INTEGER NOT NULL PRIMARY KEY,"Name" VARCHAR(100),"Gender_man"
10 BOOLEAN)
11 SET TABLE "ClobTest" INDEX'32 2'
12 SET TABLE "Table2" INDEX'192 0'
13 SET TABLE "Table3" INDEX'256 0'
14 ALTER TABLE "ClobTest" ALTER COLUMN "Id" RESTART WITH 2
15 ALTER TABLE "ImageTest" ALTER COLUMN "Id" RESTART WITH 0
16 CREATE USER SA PASSWORD ""
17 GRANT DBA TO SA
18 SET WRITE_DELAY 60
```

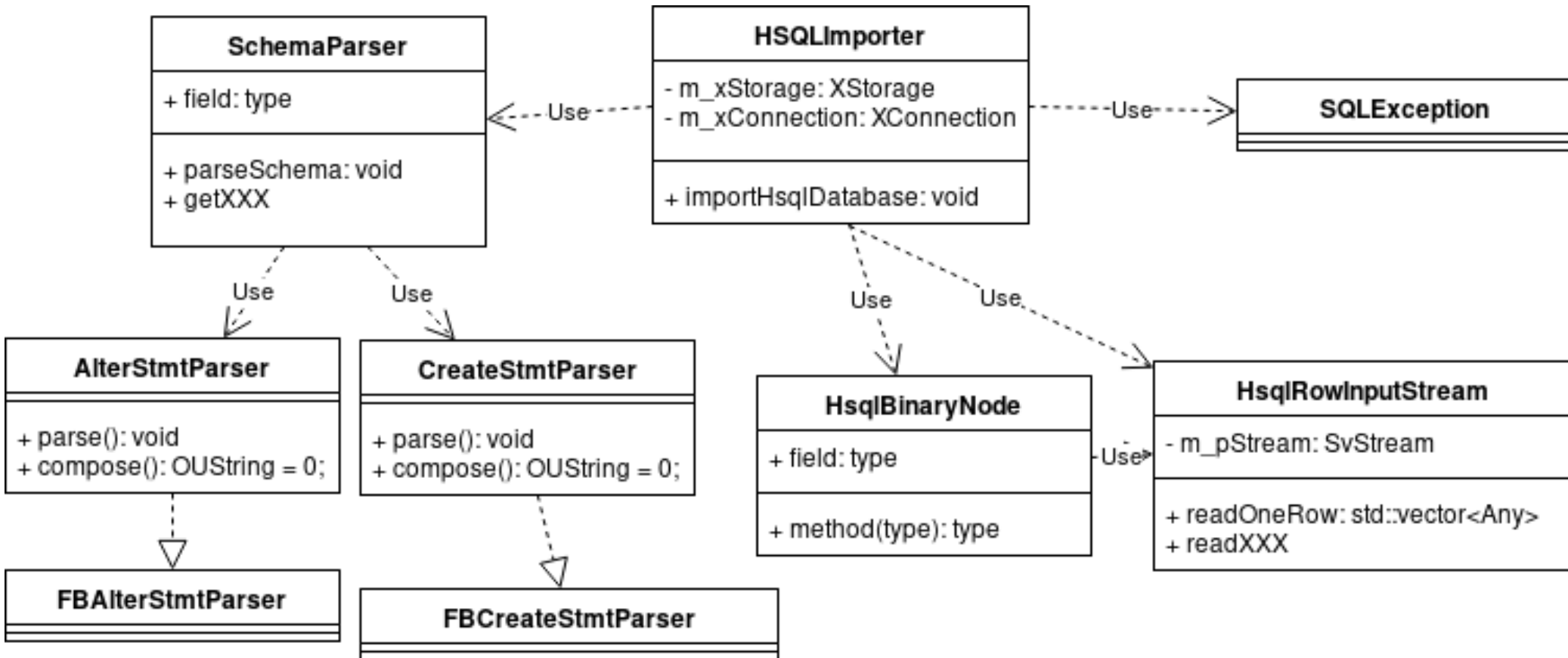
```
SET TABLE "Table2" INDEX'192 0'
```

# Challenges #2: binary format





# Architecture



# Data type formats

**Varchar: <Size><String>**

**Numeric/Decimal**

- java.math.BigInteger to OUString
- double-dabble

**Time/Date/Datetime**

- from 1970-01-01 00:00:00.000
- milliseconds vs. YMDhms

# Testing migration library

- Use existing HSQL unit tests – with migration
- Test SQL parser
  - With special cases: e.g. VARCHAR default parameter
- Test binary data: Is that the same as before?

# TODOs #1 – Time migration problem

Time/date/datetime values of HSQLDB depends on OS Timezone, whereas Firebird ignores it (yet).

`DATE=$(TZ=Asia/Taipei date +"%F %H:%M") libreoffice -base`

Pop-up window asking user if he/she wants to migrate using OS timezone?

## TODOs #2: using SQLParser

- connectivity/source/parse/\*
- Bison based parser
- Hard-coded values:

```
pSelect→getChild(3)→getChild(0)  
→getChild(1);
```



```
pSelect→getMofifiers()→isLimitUsed();
```

# SQLParser example

SQL\_TOKEN\_CACHED

base\_table\_def:

```
»      SQL_TOKEN_CREATE SQL_TOKEN_TABLE table_node '('
»      base_table_element_commalist ')'
»      { $$ = SQL_NEW_RULE;
»      $$->append($1);
»      $$->append($2);
»      $$->append($3);
»      $$->append(newNode("(", SQLNodeType::Punctuation));
»      $$->append($5);
»      $$->append(newNode(")", SQLNodeType::Punctuation)); }
»      ;
```



# TODOs #2: using SQLParser

## View definitions

- concat vs. ||
- ASCII() vs ASCII\_CHAR(), char() vs ascii\_char()
- truncate() vs trunc()
- Space(c: Number) vs ??

```
CREATE VIEW "vEventCustomers" ("ID","EventDescription","EventCustomer","QuantityReserved") AS
SELECT "Events"."ID", "Events"."EventDescription", CONCAT ( "Customers"."LastName", CONCAT( ', ',
"Customers"."FirstName" ) ) AS "EventCustomer", "Reservations"."QuantityReserved" FROM
"Reservations", "Events", "Customers" WHERE "Reservations"."EventID" = "Events"."ID" AND
"Reservations"."CustomerID" = "Customers"."ID"
```

# TODOs #2: using SQLParser

## HSQldb → SDBC conversion

- Not just Firebird should be allowed.
- For that a stable, huge parser is needed.
- `parse.setDialect(Dialect.Firebird3);`
  - `sSql = parser.compose(Dialect.Firebird3);`



## TODOs #3: other bugs

[https://bugs.documentfoundation.org/show\\_bug.cgi?id=116968](https://bugs.documentfoundation.org/show_bug.cgi?id=116968)



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# Thank you page!

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