



SQLite Overview

Presentation shared with the

St. Louis Unix Users Group

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Welcome



Introduction

Volunteer presenters:

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Employment: McAuto, CINCOM, Miles, Bayer, IBM

Duties: User Support, Program Product Support, MVS

- *Education, Mathematics BA, MS Illinois State, Ph.D MU*
- *Interests: Op/Sys, Linux configuration, various pgm lang.*
- *Linux level – experienced but not expert*



Overview

This will be an introduction to learning about SQLite 3 Database.

- . More of a road map than a rigid check list.
- . Covers where to start.
- . Then, maybe, where to go next.



Database

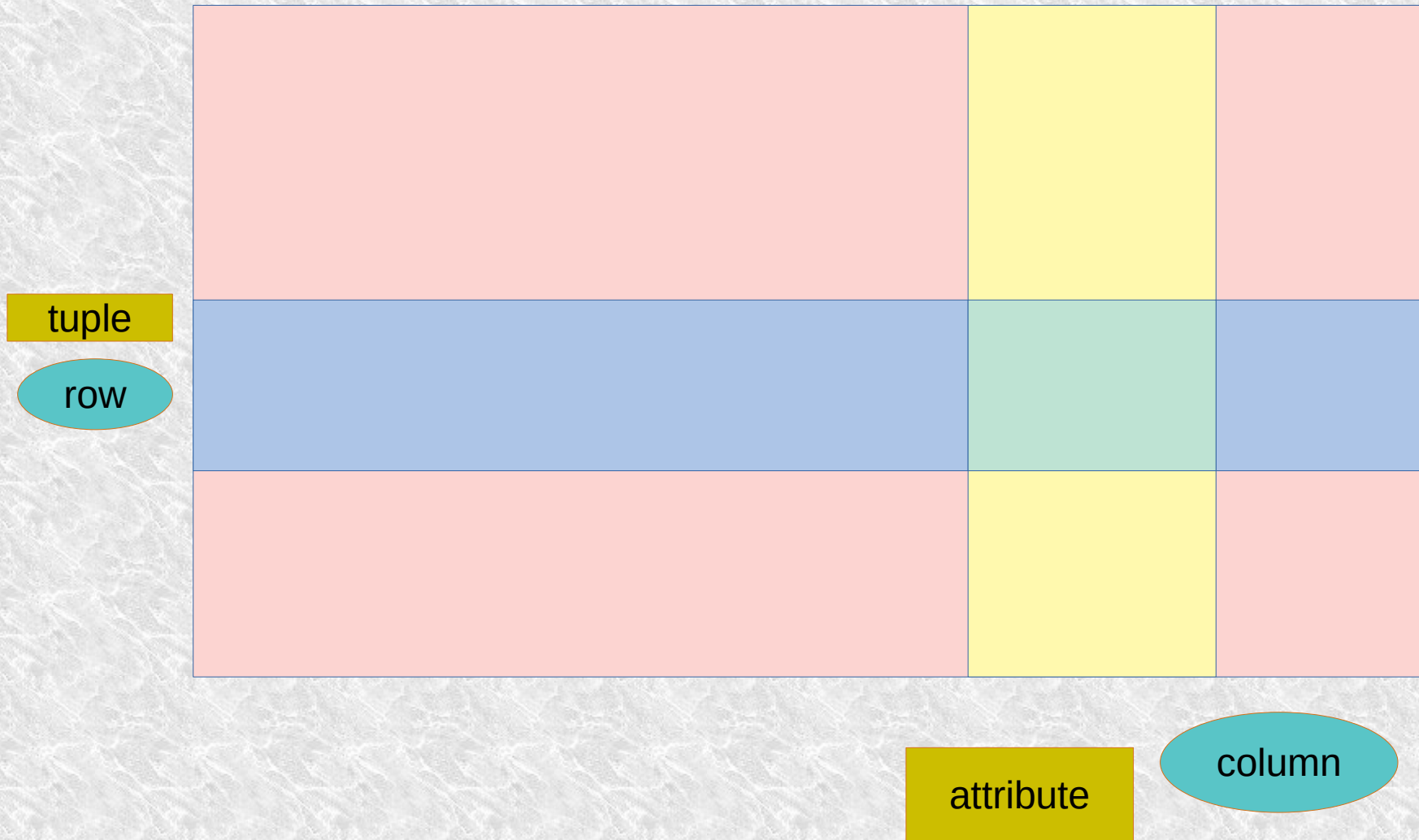
A database is a set of data store in a computer. This data is usually structured in a way that makes the data easily accessible.

What is a relational database

A relational database is a type of database. It uses a structure that allows us to identify and access data in relation to another piece of data in the database. Often, data in a relational database is organized into tables.



Relation





What is a RDBMS?

A relational database management system (RDBMS) is a program that allows you to create, update and administer a relational database. Most RDBMSs use the SQL language to access the data.

E. F. Codd's rules for RDBMS

0. Foundation Rule
1. The Information Rule
2. Guaranteed Access Rule
3. Systematic Treatment of NULL values
4. Dynamic online catalog based on relational model
5. Comprehensive data sub-language
6. View of updating Rule
- 7 Set level insert, delete, and update rule
8. Physical data independence
- 9 .Logical data independence
- 10.Integrity Independence
- 11.Distribution independence
- 12.Non-suversion rule



What is SQL?

SQL (Structured Query Language) is a programming Language used to communicate with data stored in a RDBMS. SQL syntax is usually similar to the English Language in order to make it 'easy' to read, write and Interpret data.

Some Common SQL terms

Data Definition language

CREATE
DROP
ALTER

Data Manipulation language

Insert
Update
Delete

Data Query language

SELECT

SELECT
WHERE
BETWEEN
AND/OR/NOT
MIN/MAX
OFFSET/LIMIT



What is SQLite?

SQLite is a popular open source SQL database. It can store
An entire database in a single file. One of the most significant
Advantages this provides is that all of the data can be locally
Without having to connect your DB to a server

Executive summary of SQLite

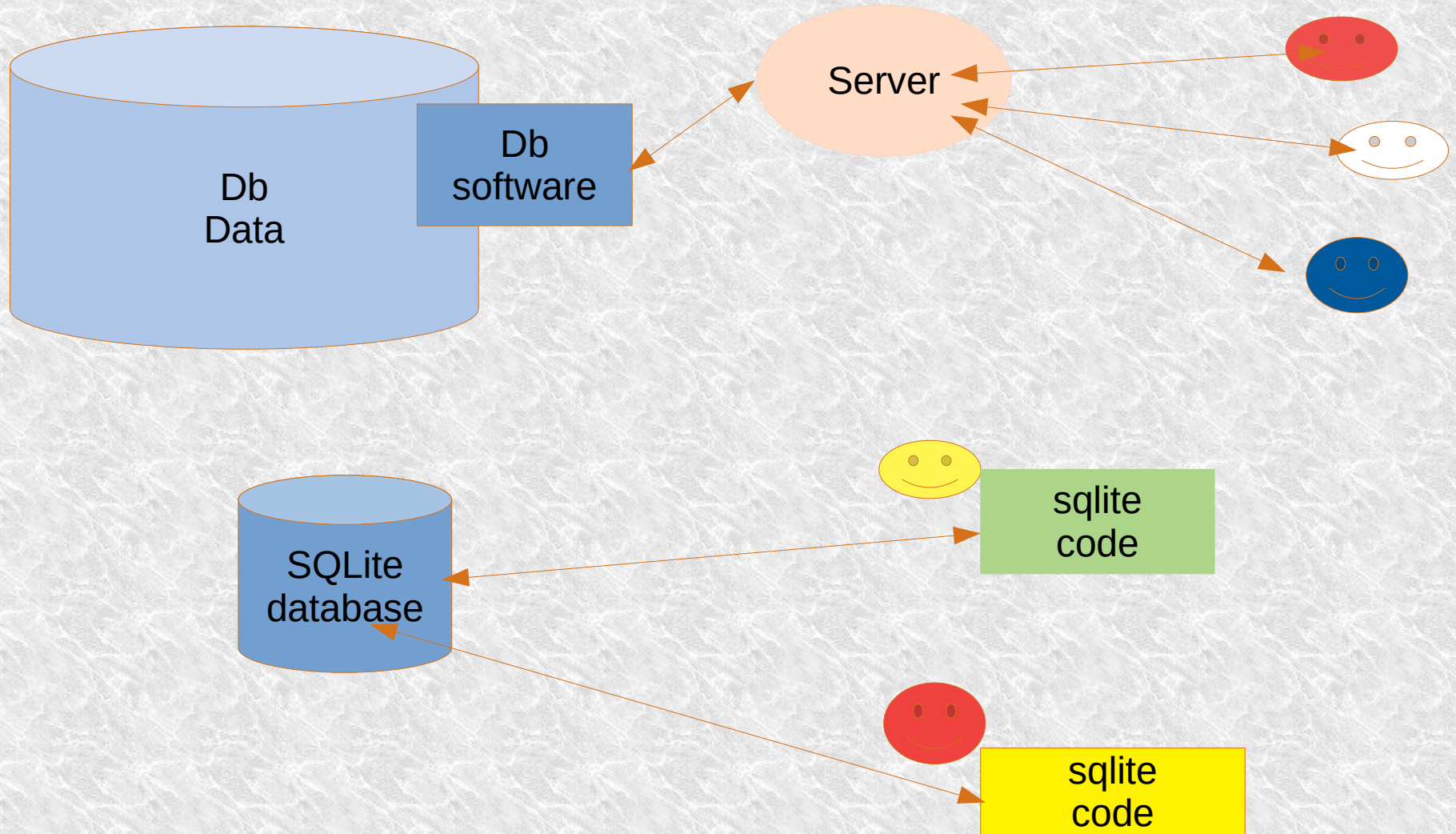
Full feature SQL
Billion of deployments
Single file database
Source in one file (sqlite3.c)
Small footprint
Max DB size 281 tera bytes
Max row size 1 gigabyte

Fast, extensive, detailed doc.
Faster than direct file I/O
Aviation quality
Zero-configuration
Stable, enduring format
Extensive long term support

Small, fast, reliable choose any three.

www.sqlite.org/about.html

Diagrams





Where is SQLite found?

Every Android, Iphone, Mac, Windows 10, Firefox, Chrome, Safari, Skipe Itunes, Dropbox, TurboTax

How can SQLite be used

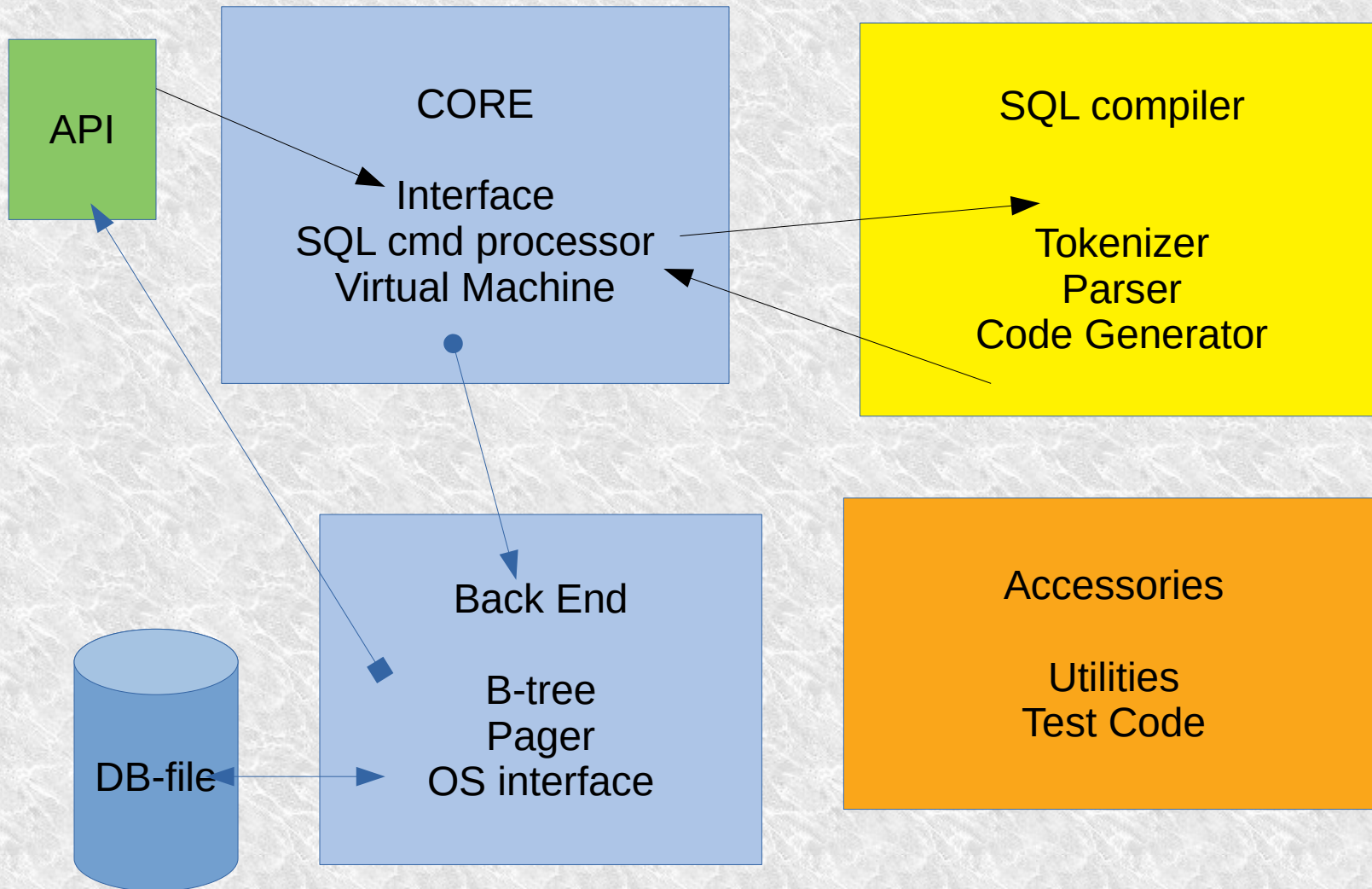
SQLite access written in C but
APIs for C, C++, Tk/Tcl, Perl, PHP, Python, Ruby, Java
(originally written as Tk extension)



Reference Sites

- SQLite is public domain (discuss free)
- SQLite is open-source NOT open contribute
 - www.sqlite.org
 - www.sqlitetutorial.org
 - www.sqlitebrowser.org

SQLite architecture





When to use SQLite

Embedded applications
Portable and read only
Local single userDisk Access
Testing

When NOT to use SQLite

Large or multi-volume db-s
Network communication required
Multi Updaters



Simple CLI example

```
$ sqlite3
sqlite3> CREATE TABLE test (fn TEXT, age
                    INTEGER,ht integer);
sqlite3> INSERT INTO test VALUES('Herman', 35, 73);
sqlite3> INSERT INTO test VALUES('George, 44,68);
sqlite3> SELECT * from test;
sqlite3> Select rowid,fn,ht,age FROM test;
sqlite3> .quit
```

```
other(s)
.table
.export
.import
.header on
.columns on
...
.timer on/off
and more.
```



Ed's weather data example

Install sqlite3
Obtain some data via curl
Show use of sqlite3 command line
Import some data – clean up bad rows
Export back out to combine data
Script to import files to separate tables
Show use of SQL schema and query examples
Show how to use gnuplot with SQLite data via bash

Q & A



Weather Info URLs

<https://www.visualcrossing.com/resources/documentation/weather-data/weather-data-documentation/>

<https://www.visualcrossing.com/resources/blog/how-to-import-weather-data-into-mysql/>



Simple python example

```
import sqlite3
# conn = sqlite3.connect(:memory:)
conn = sqlite3.connect(test.db)
c = conn.cursor()
c.execute ("""CREATE TABLE cust
            first_name TEXT,
            last_name TEXT,
            email TEXT)""")
#INTEGER, REAL ,TEXT, NULL, BLOB
            """Insert code""")
conn.commit()
conn.close()
```

```
my_insert = """INSERT INTO cust
(first_name, last_name, email) VALUES
('Al', 'Smith', 'Asmith@cindians.com')"""
c.execute(my_insert)
```



SQLite and python

CRUD

Create
Read
Update
(Insert)
Delete



Internet References

Works cited.

<http://www.sqlite.org>

<http://www.sqlitetutorial.net>

The Definitve Guide to SQLite (ver1 and ver2)

Using SQLite

Talks/Interviews with Richard Hipp

Multiple utube episodes

DB Browser for SQLite (sqlitebrowser.org info)

Samples provide to SLUUG.



Later

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Questions at the End

What are your Questions?

Presentation shared with the
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2021-07-09
Questions?