

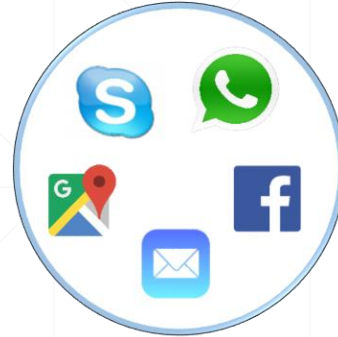
VNR SQLite Carver

Veronika - Rusolut

SQLITE IS EVERYWHERE

Most applications that people use every day

*Flight software
Car multimedia
systems
Drones*



*WEB browsers
File hosting
services*



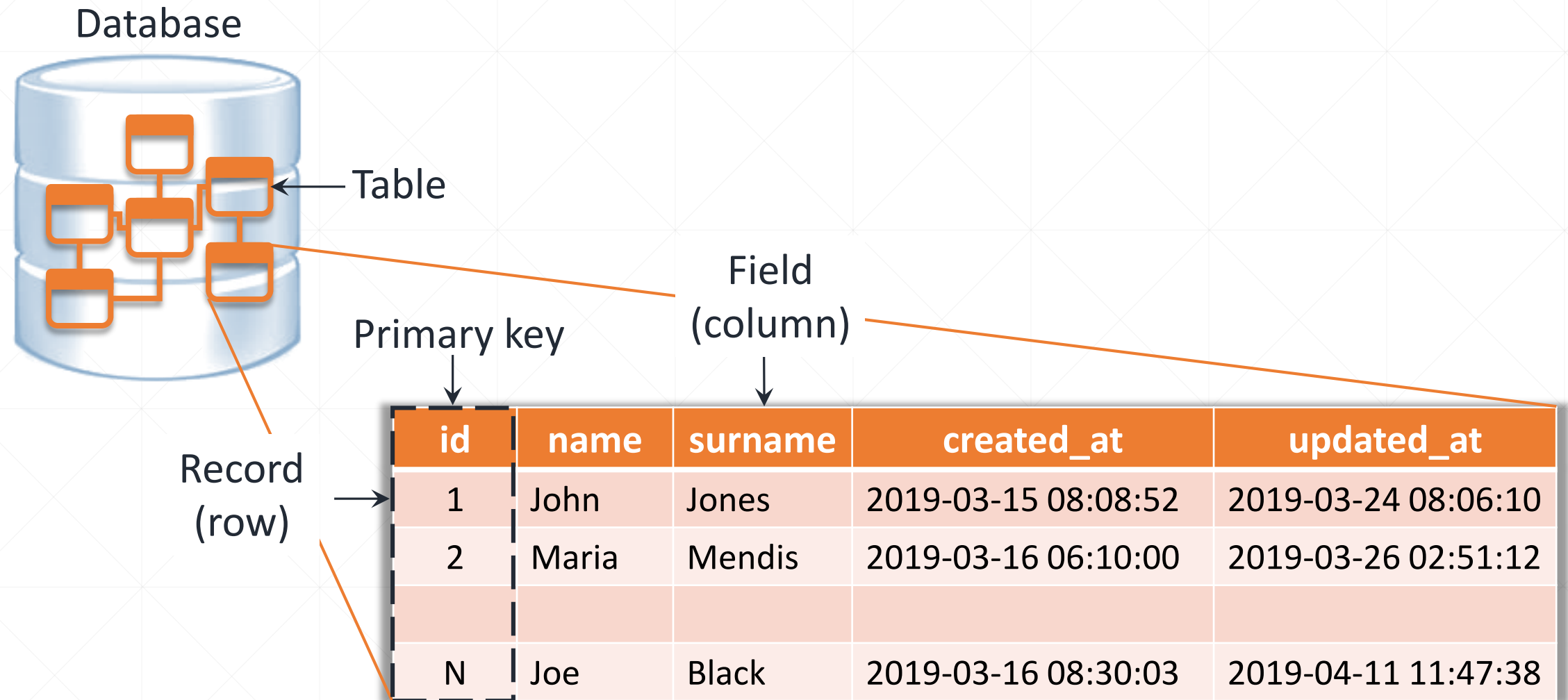
*PC
Laptops
Mobile devices*



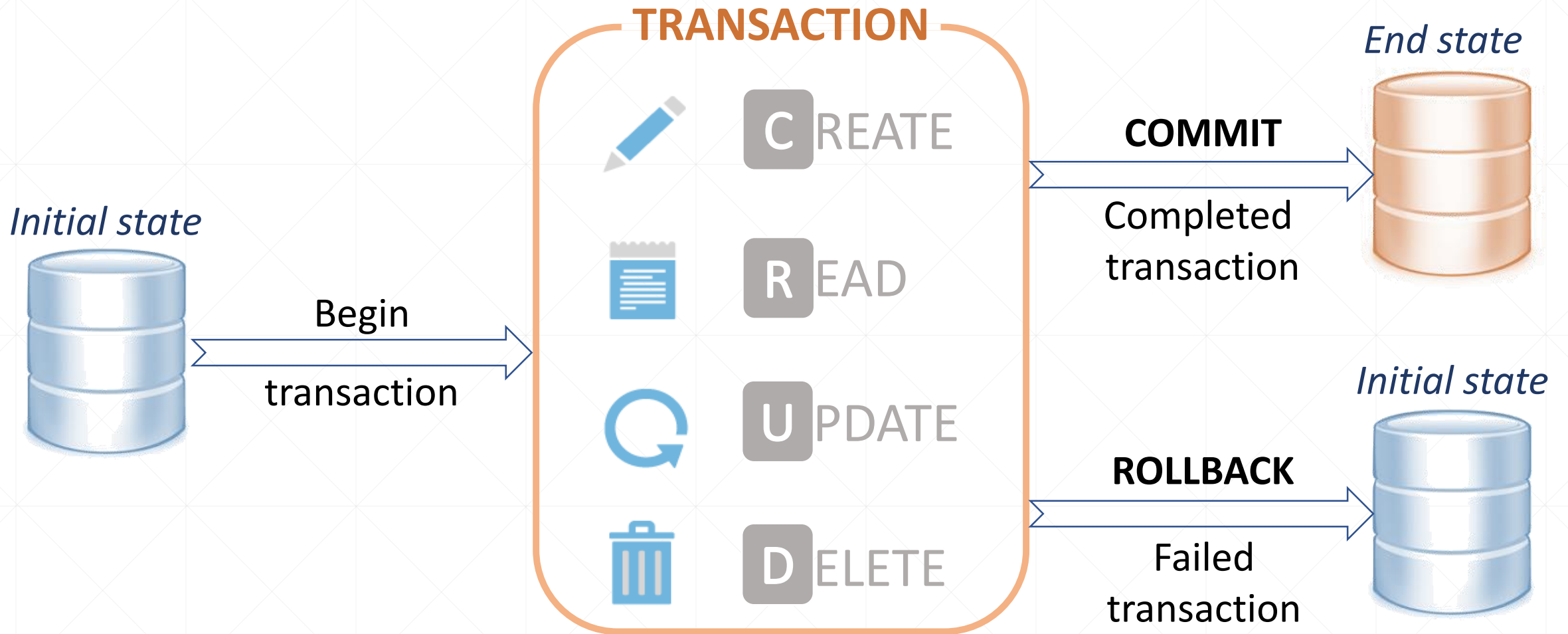
*Well-known
operating
systems*



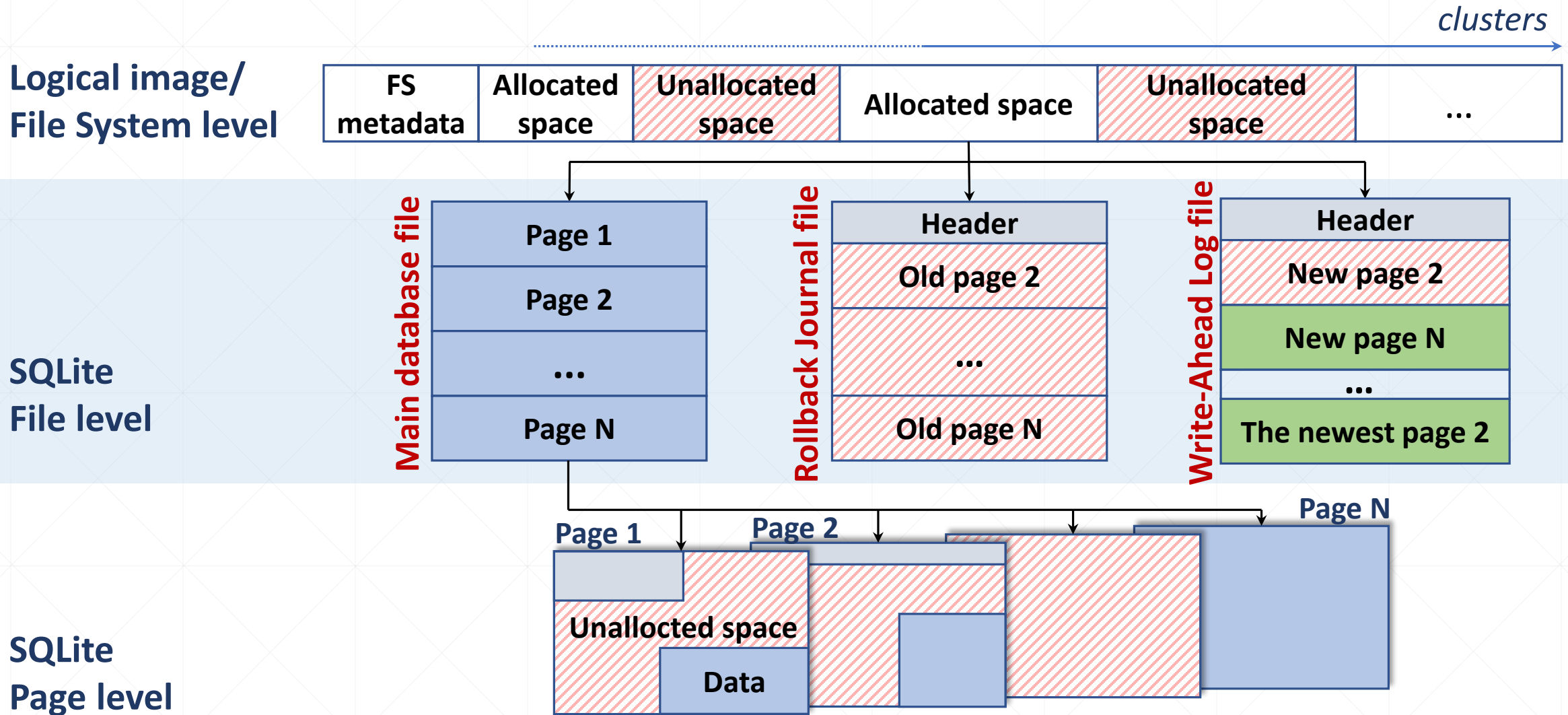
WHAT'S INSIDE SQLITE DATABASE



DATABASE TRANSACTION



DATA RECOVERY LOOK INTO SQLITE



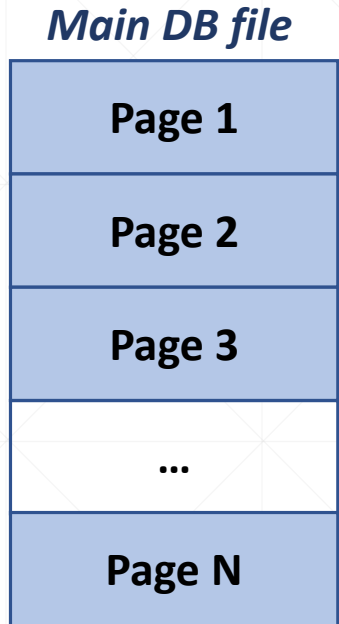
(* .db, *.sqlite, *.sqlite3 etc.)



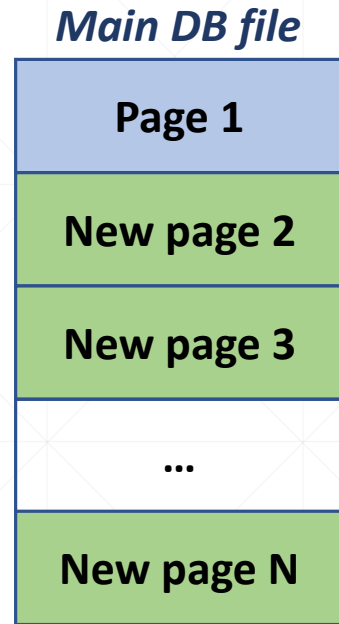
THE ROLLBACK JOURNAL

("-journal" file)

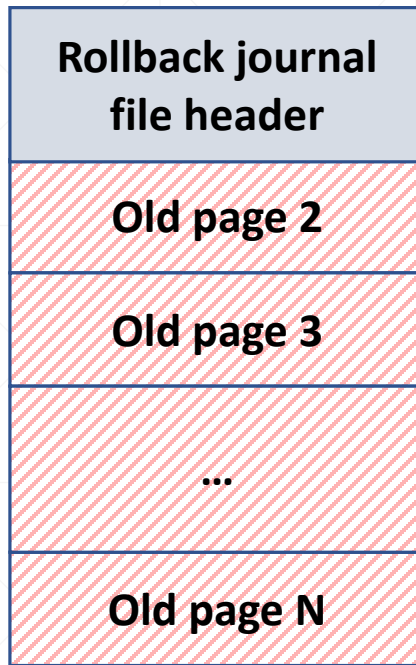
Initial state



Data change

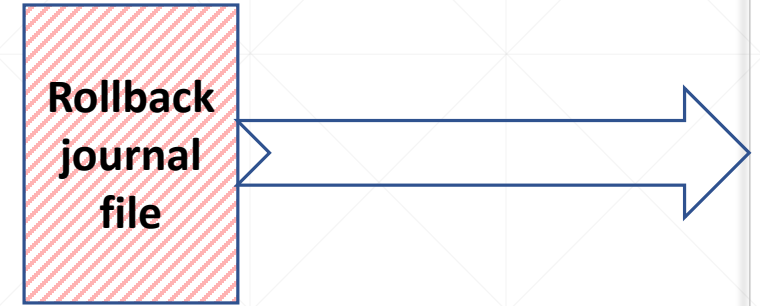


Rollback journal file

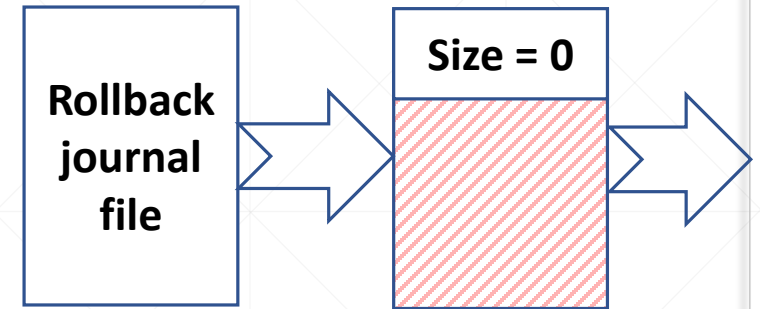


Commit

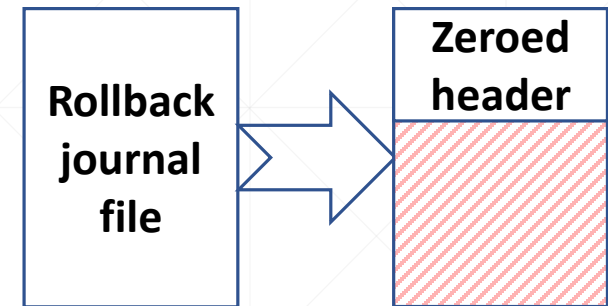
DELETE



TRUNCATE



PERSIST

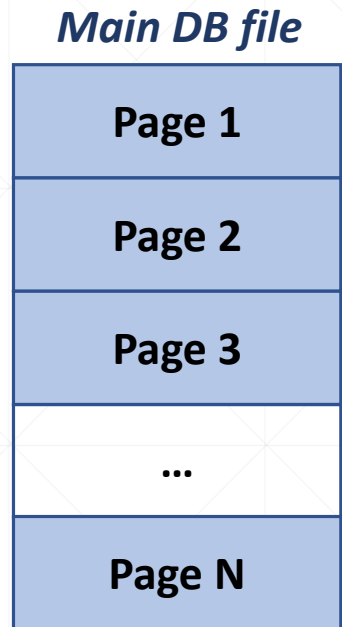


File system unallocated space

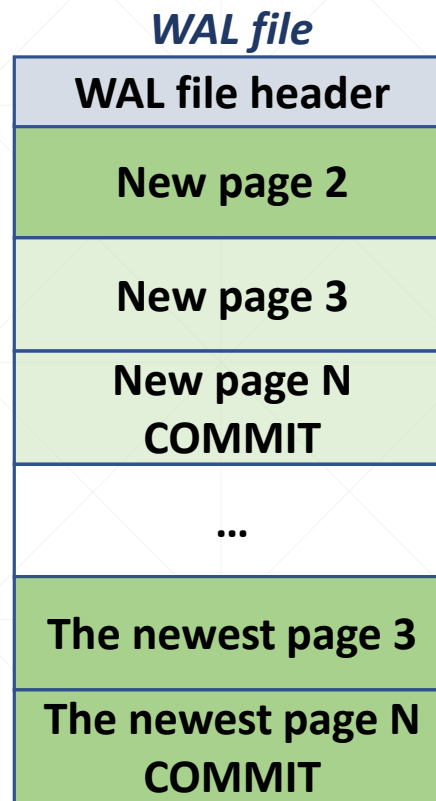
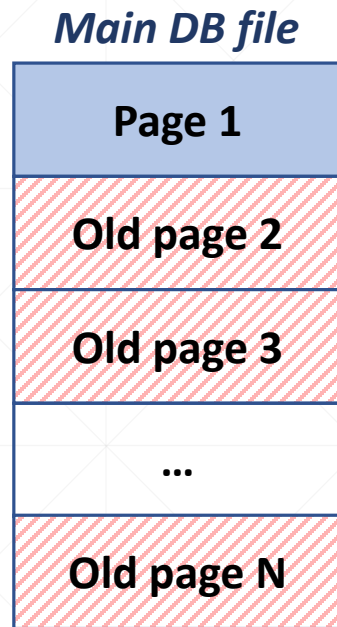
THE WRITE-AHEAD LOG

("-wal" file)

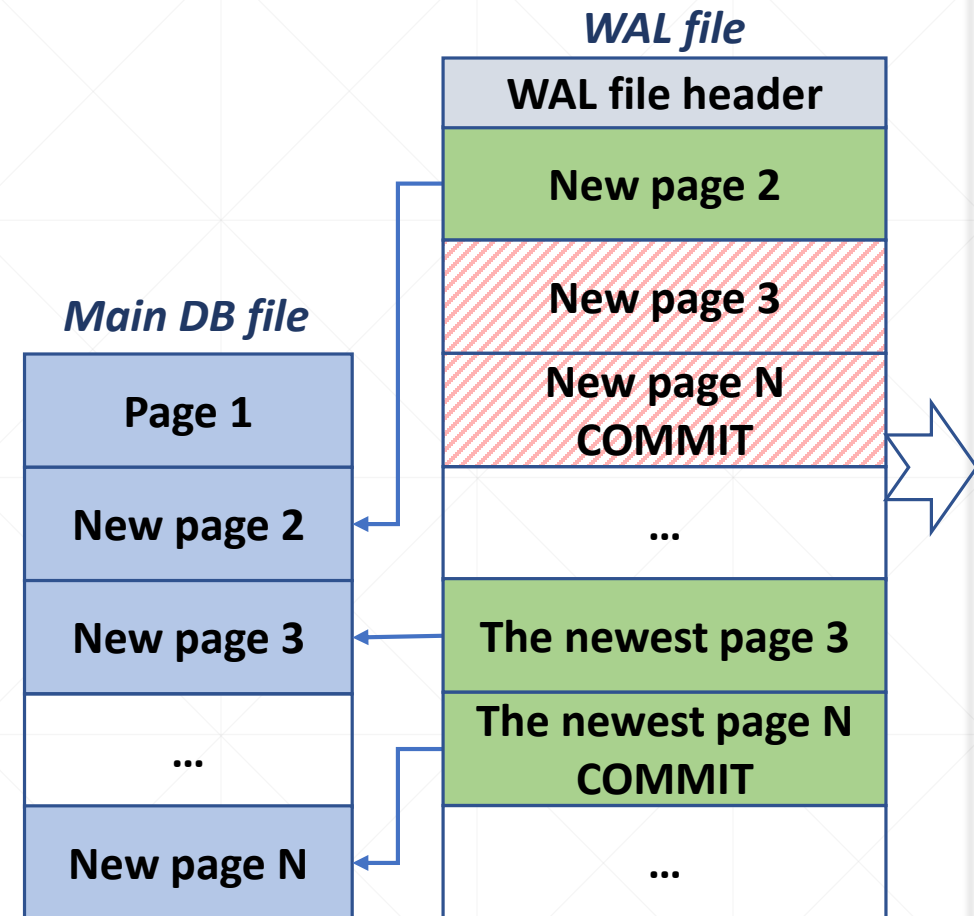
Initial state



Data change

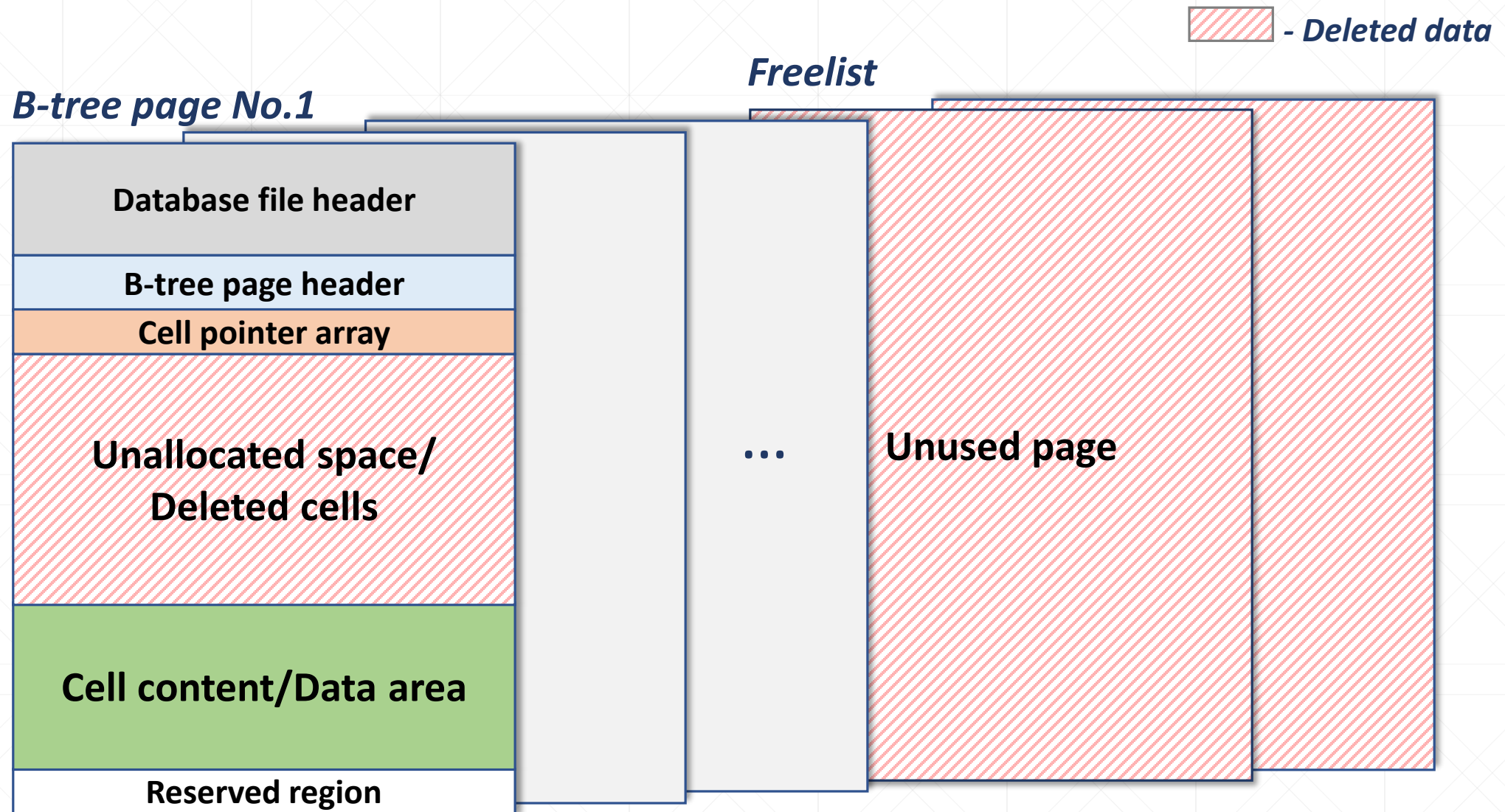


Checkpoint



File system unallocated space

SQLITE DATABASE PAGES



Record



Record length, B	ROWID	Record header length, B	Type of Field1	...	Type of Field N	Data of Field 1	...	Data of Field K
------------------	-------	-------------------------	----------------	-----	-----------------	-----------------	-----	-----------------

Type of Field	Data size, B	Data type
0	0	NULL
$1 \leq N \leq 4$	N	Signed integer
5	6	Signed integer
6	8	Signed integer
7	8	IEEE float
8	0	Integer 0
9	0	Integer 1
$N \geq 12$ even	$(N-12)/2$	BLOB
$N \geq 13$ odd	$(N-13)/2$	TEXT

DELETED CELL FROM UNALLOCATED SPACE

Changed data of deleted cell

Record length, B	ROWID	Record header length, B	Type of Field1	...	Type of Field N	Data of Field 1	...	Data of Field K	
6D 69 6F 77 79 63 68 20 6C 6F 73 6F 77 20 7A 61	20 6B 61 7A 64 79 20 73 6D 73 2E 20 4D 61 73 7A	20 63 7A 61 73 20 64 6F 20 31 33 3A 30 30 2E 20	72 65 67 3A 72 6D 66 2E 66 6D 20 2F 32 2C 34 36	7A 6C 2B 34 38 36 30 32 30 30 36 30	6F 6D 2E 73 61 6D 73 75 6E 67 2E 61 6E 64 72 6F	69 64 2E 6D 65 73 73 61 67 69 6E 67 00 00 04 9D	miowych losow za	kazdy sms. Masz	
30 00 02 15 00 05 05 08 09 01 09 08 00 82 4D 25	08 08 01 47 09 08 08 00 08 00 00 00 08 08 00 08	08 08 00 08 00 08 08 08 08 08 08 08 00 08 00 00	01 08 37 32 35 32 01 5E 94 1D BE 92 01 5E 94 1D	B3 40 FF 54 6F 20 6E 69 65 20 7A 61 72 74 2C 20	77 79 67 72 61 6A 20 64 7A 69 73 20 6E 61 77 65	74 20 35 30 30 2E 30 30 30 20 7A 6C 2E 20 4F 64	6D 69 65 6E 20 6C 6F 73 2C 20 6F 64 62 69 65 72	7A 20 32 30 30 20 73 7A 63 7A 65 73 6C 69 77 79	63 68 20 6C 6F 73 6F 77 2E 20 44 6F 20 31 31 3A
34 30 20 6F 64 70 69 73 7A 20 57 59 47 52 41 4D	20 70 6F 64 20 37 32 35 32 20 7A 61 20 32 2C 34	36 7A 6C 2E 20 4E 69 65 20 70 72 7A 65 67 61 70	20 6F 6B 61 7A 6A 69 2E 20 72 65 67 3A 72 6D 66	2E 66 6D 2B 34 38 36 30 32 30 30 36 30	63 6F 6D 2E 73 61 6D 73 75 6E 67 2E 61 6E 64 72	6F 69 64 2E 6D 65 73 73 61 67 69 6E 67 00 00 03	8C 30 00 02 15 00 05 05 08 09 01 09 08 00 82 4D	25 08 08 01 47 09 08 08 00 08 00 00 00 08 08 00	oid.messaging...

REPRESENTATION OF SQL TABLES

SQL table definition

```
CREATE TABLE my_table (
```

```
id INTEGER PRIMARY KEY,
```

```
productID BIGINT,
```

```
address TEXT,
```

```
name VARCHAR(255),
```

```
date DATETIME,
```

```
adds NUMERIC,
```

```
image BLOB,
```

```
longitude REAL,
```

```
latitude REAL)
```

SQLite data types

INTEGER

TEXT

NUMERIC

BLOB

REAL

SQLite storage classes

INTEGER

Type 1-6,8,9

TEXT

Type ≥ 13 odd

NULL

Type 0

BLOB

Type ≥ 12 even

REAL

Type 7

- Is that all?
- Yes. No. It's complicated!

Any column in an SQLite database may store a value of any storage class ...

... and so we decided to create

VNR SQLite Carver

EXISTING SOLUTIONS FOR IN-DEPTH SQLITE DATA CARVING

Manual

HEX Viewer

- **PROS**
 - Detailed data analysis
- **CONS**
 - Extremely time consuming
 - You need to convert raw data manually
 - Requires very deep knowledge of database theory

Semi-automatic

VNR SQLite Carver

- **PROS**
 - Universal flexible platform
 - Get results in a few simple steps
 - Adjustable results
 - More data than other solutions
- **CONS**
 - You may need a minimal SQLite knowledges

Automatic

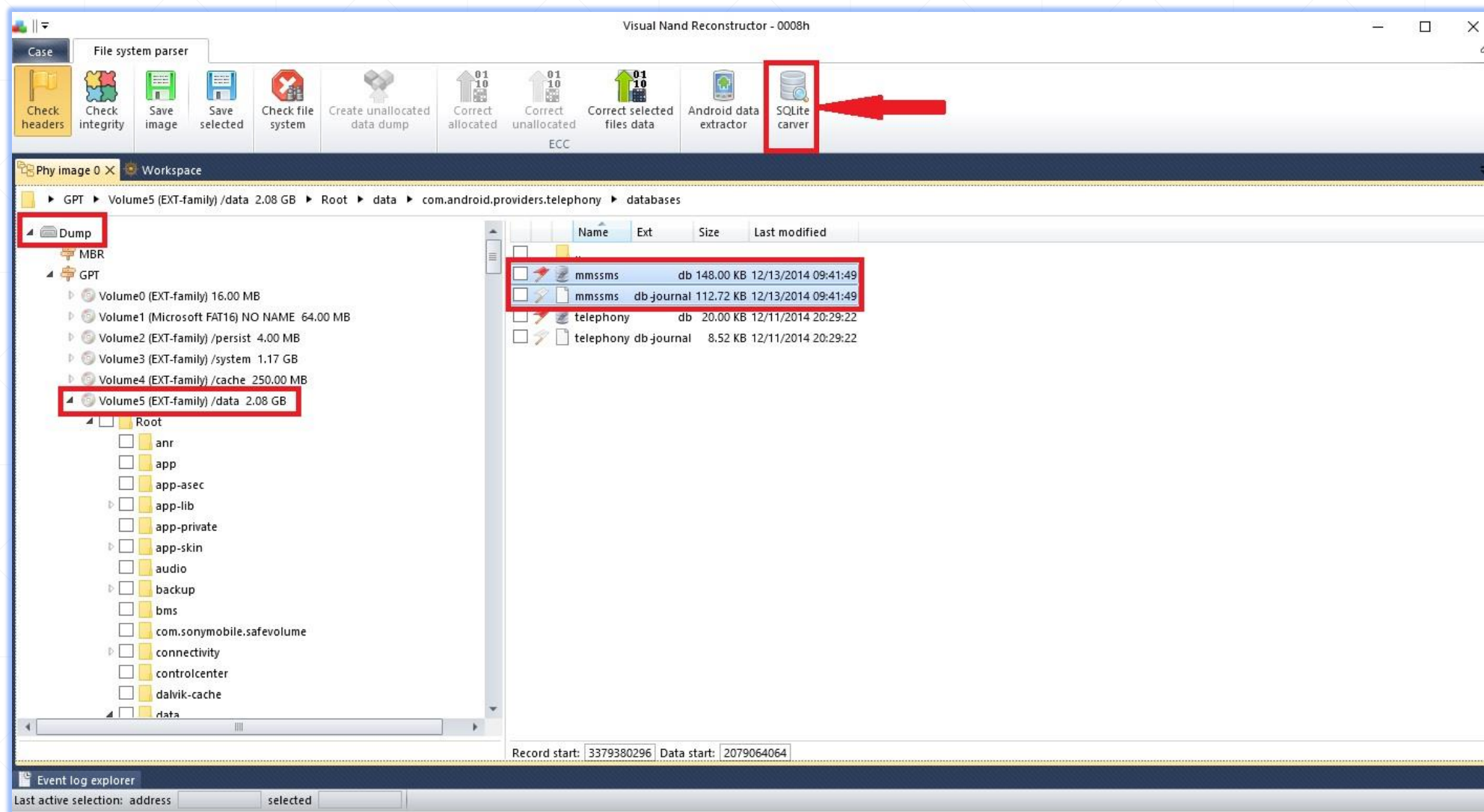
Well-known mobile forensic solutions

- **PROS**
 - One-click solutions
 - Easy to use interface
 - No SQLite knowledges required
- **CONS**
 - Lack of flexibility
 - Need to wait for updates from vendor support
 - Limited application support

MORE ADVANTAGES OF VNR SQLITE CARVER

- It automatically creates carving template which can retrieve all possible data from the dump (unallocated and allocated space)
- It works on database files, partitions and the whole dump
- It recognizes various data types and use the appropriate converters to transform data to a readable form
- It removes all duplicates to clean your results from unnecessary garbage
- It is a universal tool – you shouldn't wait while developers of any other tool will release the update to add new apps or make changes according to the new app version

STEP 1. SELECT SOURCE AND PRESS BUTTON



STEP 2. SELECT THE MODE TO GET CARVING TEMPLATE

SQLite carver

Select mode:

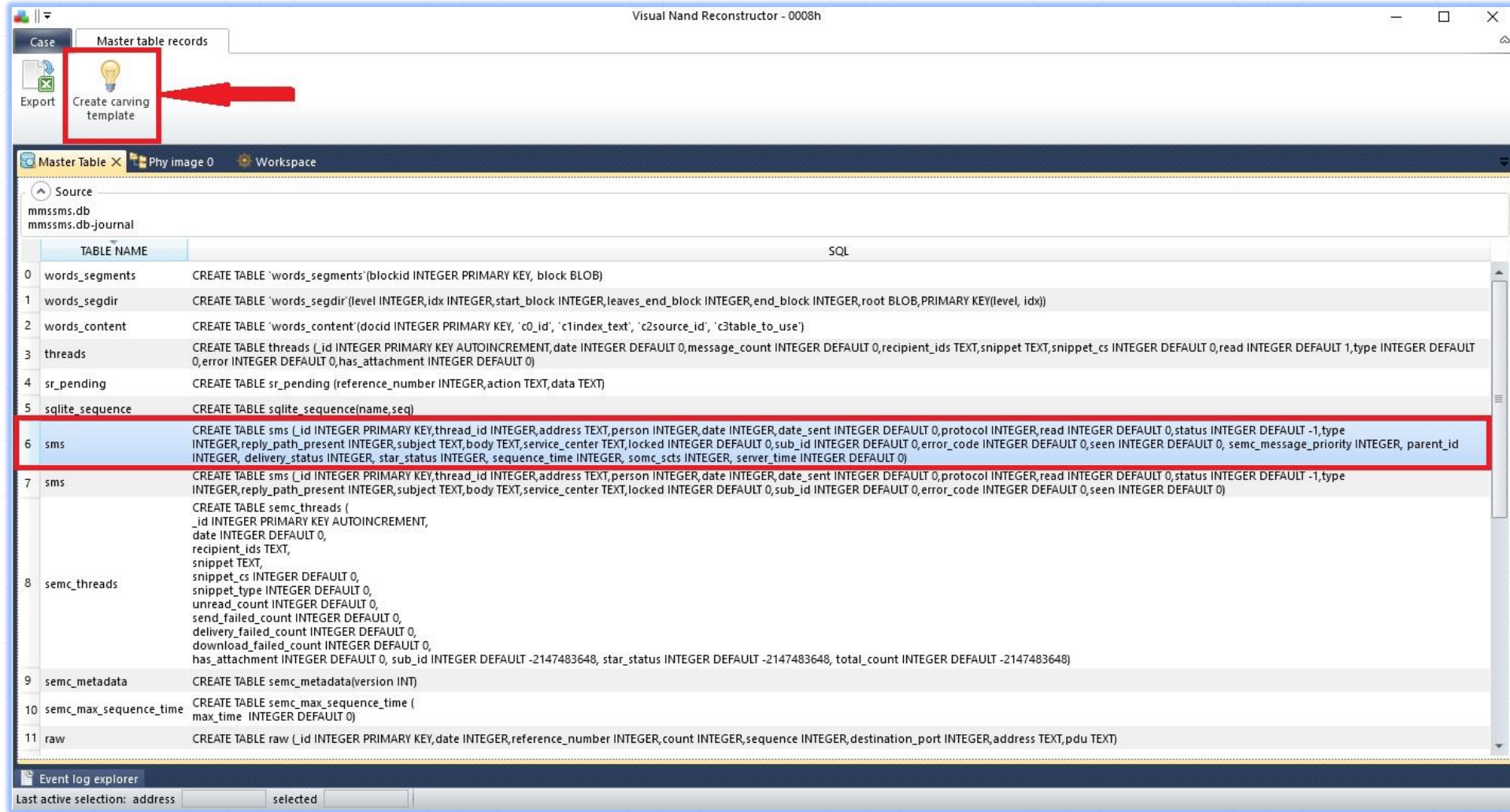
☒ Get carving templates for all tables

☐ Get carving templates for selected table

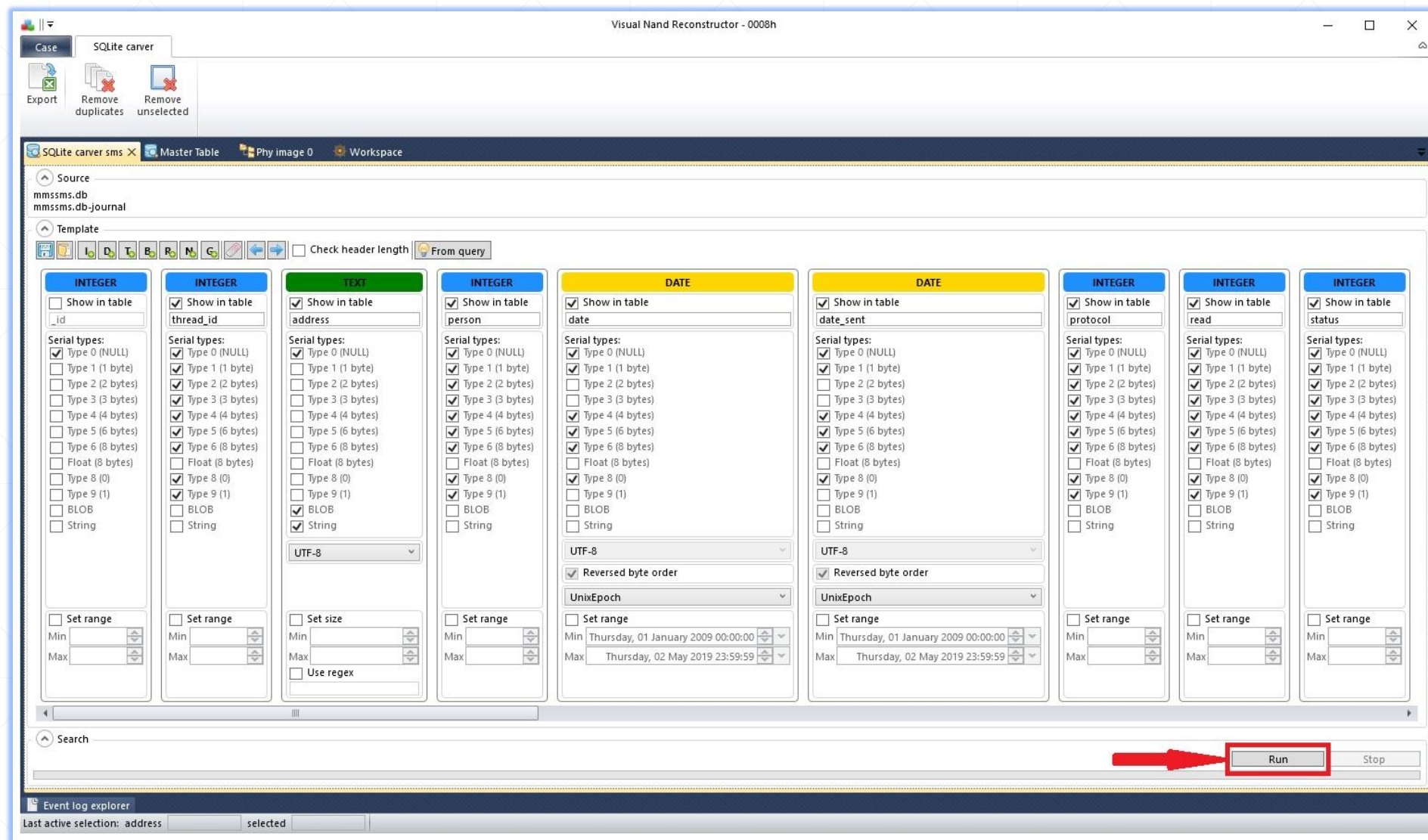
☐ Empty carving template

Next

STEP 3. SELECT TABLE YOU ARE INTERESTED IN AND GET CARVING TEMPLATE



STEP 4. RUN SQLITE DATA CARVING PROCESS



STEP 5. GET DATA

Visual Nand Reconstructor - 0008h

Case SQLite carver

Export Remove duplicates Remove unselected

Processing results

SQLite carver sms x Master Table Phy image 0 Workspace

Source
mmssms.db
mmssms.db-journal

Template

Search

Carved data

Group by: None

Grouping
Sorting
Filtering data

	☒	rowid	thread_id	address	person	date	date_sent	protocol	read	status	type	reply_path_present	subject
1	☒	0	293	ING		12.12.2014 18:59:24		0	1	-1	1	0	Obciazenie rach...7017kwota312,70PLN RATA KREDY
2	☒	15104	301	SMYK Sp.z		12.12.2014 12:42:43		0	1	-1	1	0	20% rabatu na WSZYSTKIE zabawki w SMYKU! MEGA
3	☒	15104	300	PELARGO		12.12.2014 10:33:07		0	1	-1	1	0	W SMYKU 20% rabatu na WSZYSTKIE zabawki! MEGA
4	☒	0	298	+4869668		11.12.2014 20:32:59			1	0	2		Cześć! Amelia jutro nie idzie do szkoły bo się rozcho
5	☒	15104	297	Kto tam?		11.12.2014 20:29:46			1	-1	1		Nieodebrane połączenia. Teraz mozesz oddzwonic c
6	☒	1	296	+4851221		10.12.2014 10:57:45			1	0	2		Musisz zdążyć po dzieci dzisiaj bo my odbieramy i k
7	☒	0	293	ING		10.12.2014 10:51:52		0	1	-1	1	0	Uznanie rach...7017kwota1239,30PLN WYNAGRODZ
8	☒	0	295	60268		10.12.2014 07:01:37		0	1	-1	1	0	Jak zobaczysz ten DOWCIP to padniesz ze smiechu.
9	☒	0	294	+4888916		09.12.2014 12:15:15		0	1	-1	1	0	Nowy portal aukcyjny aukcjoneo.pl zaprasza sprzec
10	☒	0	293	ING		08.12.2014 11:11:36		0	1	-1	1	0	ING Bank przypomina o ustaleniach dotyczących de
11	☒	5	291	+4860290		06.12.2014 13:47:18		0	1	-1	1	0	05-12-14 wystawiliśmy fakturę 503991691214. Kwota
12	☒	8	291	+4860290		06.12.2014 13:47:18		0	1	-1	1	0	05-12-14 wystawiliśmy fakturę 503991691214. Kwota

VNR SQLITE CARVER TEMPLATE ELEMENTS

INTEGER	TEXT	BLOB	REAL	NUMERIC	DATE	GAP
☒ Show in table COLUMN_NAME	☒ Show in table COLUMN_NAME	☒ Show in table COLUMN_NAME	☒ Show in table COLUMN_NAME	☒ Show in table COLUMN_NAME	☒ Show in table COLUMN_NAME	Min 0 Max 3
Serial types: ☒ Type 0 (NULL) ☒ Type 1 (1 byte) ☒ Type 2 (2 bytes) ☒ Type 3 (3 bytes) ☒ Type 4 (4 bytes) ☒ Type 5 (6 bytes) ☒ Type 6 (8 bytes) ☐ Float (8 bytes) ☒ Type 8 (0) ☒ Type 9 (1) ☐ BLOB ☐ String	Serial types: ☒ Type 0 (NULL) ☐ Type 1 (1 byte) ☐ Type 2 (2 bytes) ☐ Type 3 (3 bytes) ☐ Type 4 (4 bytes) ☐ Type 5 (6 bytes) ☐ Type 6 (8 bytes) ☐ Float (8 bytes) ☐ Type 8 (0) ☐ Type 9 (1) ☒ BLOB ☒ String Unicode (UTF-8)	Serial types: ☒ Type 0 (NULL) ☐ Type 1 (1 byte) ☐ Type 2 (2 bytes) ☐ Type 3 (3 bytes) ☐ Type 4 (4 bytes) ☐ Type 5 (6 bytes) ☐ Type 6 (8 bytes) ☐ Float (8 bytes) ☐ Type 8 (0) ☐ Type 9 (1) ☒ BLOB ☐ String	Serial types: ☒ Type 0 (NULL) ☐ Type 1 (1 byte) ☐ Type 2 (2 bytes) ☐ Type 3 (3 bytes) ☐ Type 4 (4 bytes) ☐ Type 5 (6 bytes) ☐ Type 6 (8 bytes) ☐ Float (8 bytes) ☐ Type 8 (0) ☐ Type 9 (1) ☐ BLOB ☐ String ☒ Reversed byte order	Serial types: ☒ Type 0 (NULL) ☐ Type 1 (1 byte) ☐ Type 2 (2 bytes) ☐ Type 3 (3 bytes) ☐ Type 4 (4 bytes) ☐ Type 5 (6 bytes) ☐ Type 6 (8 bytes) ☐ Float (8 bytes) ☐ Type 8 (0) ☐ Type 9 (1) ☐ BLOB ☒ String	Serial types: ☒ Type 0 (NULL) ☐ Type 1 (1 byte) ☐ Type 2 (2 bytes) ☐ Type 3 (3 bytes) ☐ Type 4 (4 bytes) ☐ Type 5 (6 bytes) ☐ Type 6 (8 bytes) ☐ Float (8 bytes) ☐ Type 8 (0) ☐ Type 9 (1) ☐ BLOB ☒ String Unicode (UTF-8) ☒ Reversed byte order UnixEpoch ☐ Set range Min Thursday, 01 January 2009 00:00:00 Max Tuesday, 26 March 2019 23:59:59	Serial types: ☒ Type 0 (NULL) ☒ Type 1 (1 byte) ☒ Type 2 (2 bytes) ☒ Type 3 (3 bytes) ☒ Type 4 (4 bytes) ☒ Type 5 (6 bytes) ☒ Type 6 (8 bytes) ☒ Float (8 bytes) ☒ Type 8 (0) ☒ Type 9 (1) ☒ BLOB ☒ String
☐ Set range Min Max	☐ Set size Min Max ☐ Use regex	☐ Set size Min Max	☐ Set range Min Max			

CARVER TEMPLATE ELEMENT FEATURES

	Set size	Set range	Text encoding	Use REGEX	Date & Time converters	Reversed byte order	Set count
INTEGER		✓					
TEXT	✓		✓	✓			
BLOB	✓						
REAL		✓				✓	
NUMERIC							
DATE		✓	✓		✓	✓	
GAP							✓

CARVER TEMPLATE ADJUSTMENT

Step 1

Combine
templates
into a
**universal
template**

**Use GAP
element**

Step 2

Specify the
range of
values

- **Set size**
- **Set range**
- **Use REGEX**

Step 3

Run data
carving
again

**Get more
clean data**

UNIVERSAL TEMPLATE

Source	
viber_messages	
viber_messages-journal	
TABLE NAME	SQL
0 messages	CREATE TABLE messages (id INTEGER PRIMARY KEY autoincrement, address TEXT NOT NULL, date INTEGER NOT NULL, read INTEGER DEFAULT 0, opened INTEGER DEFAULT 0, status INTEGER DEFAULT 0, type INTEGER NOT NULL, body TEXT, sync_read INTEGER DEFAULT 0, flag INTEGER DEFAULT 0, token TEXT, extra_mime TEXT, extra_status INTEGER, seq INTEGER, extra_upload_id LONG, extra_download_id TEXT, extra_bucket_name TEXT, extra_duration LONG, fb_status INTEGER DEFAULT 0, twitter_status INTEGER DEFAULT 0, thumbnail_x INTEGER, thumbnail_y INTEGER, description TEXT, deleted INTEGER DEFAULT 0, conversation_id INTEGER DEFAULT 0, conversation_type INTEGER DEFAULT 0, participant_id DEFAULT 0, extra_flags INTEGER DEFAULT 0, date_real INTEGER NOT NULL)
1 messages	CREATE TABLE messages (id INTEGER PRIMARY KEY autoincrement, address TEXT NOT NULL, date INTEGER NOT NULL, read INTEGER DEFAULT 0, opened INTEGER DEFAULT 0, status INTEGER DEFAULT 0, type INTEGER NOT NULL, body TEXT, sync_read INTEGER DEFAULT 0, flag INTEGER DEFAULT 0, token TEXT, extra_mime TEXT, extra_status INTEGER, seq INTEGER, extra_upload_id LONG, extra_download_id TEXT, extra_bucket_name TEXT, extra_duration LONG, fb_status INTEGER DEFAULT 0, twitter_status INTEGER DEFAULT 0, thumbnail_x INTEGER, thumbnail_y INTEGER, description TEXT, deleted INTEGER DEFAULT 0, conversation_id INTEGER DEFAULT 0, conversation_type INTEGER DEFAULT 0, participant_id DEFAULT 0, extra_flags INTEGER DEFAULT 0, date_real INTEGER NOT NULL, message_global_id INTEGER DEFAULT 0)

1st template

Column # 34 from 34

INTEGER	DATE
☒ Show in table	☒ Show in table
extra_flags	date_real
Serial types:	Serial types:
☒ Type 0 (NULL)	☒ Type 0 (NULL)
☒ Type 1 (1 byte)	☒ Type 1 (1 byte)
☒ Type 2 (2 bytes)	☐ Type 2 (2 bytes)
☒ Type 3 (3 bytes)	☐ Type 3 (3 bytes)
☒ Type 4 (4 bytes)	☒ Type 4 (4 bytes)
☒ Type 5 (6 bytes)	☒ Type 5 (6 bytes)
☒ Type 6 (8 bytes)	☒ Type 6 (8 bytes)
☐ Float (8 bytes)	☐ Float (8 bytes)
☒ Type 8 (0)	☒ Type 8 (0)
☒ Type 9 (1)	☐ Type 9 (1)
☐ BLOB	☐ BLOB
☐ String	☐ String
UTF-8	UTF-8
☐ Reversed byte order	☒ Reversed byte order
UnixEpoch	UnixEpoch
☐ Set range	☐ Set range
Min	Min Thursday, 01 January 2009 00:00:00
Max	Max Monday, 29 April 2019 23:59:59

2nd template

Column # 35 from 35

INTEGER	DATE	INTEGER
☒ Show in table	☒ Show in table	☒ Show in table
extra_flags	date_real	message_global_id
Serial types:	Serial types:	Serial types:
☒ Type 0 (NULL)	☒ Type 0 (NULL)	☒ Type 0 (NULL)
☒ Type 1 (1 byte)	☒ Type 1 (1 byte)	☒ Type 1 (1 byte)
☒ Type 2 (2 bytes)	☐ Type 2 (2 bytes)	☒ Type 2 (2 bytes)
☒ Type 3 (3 bytes)	☐ Type 3 (3 bytes)	☒ Type 3 (3 bytes)
☒ Type 4 (4 bytes)	☒ Type 4 (4 bytes)	☒ Type 4 (4 bytes)
☒ Type 5 (6 bytes)	☒ Type 5 (6 bytes)	☒ Type 5 (6 bytes)
☒ Type 6 (8 bytes)	☒ Type 6 (8 bytes)	☒ Type 6 (8 bytes)
☐ Float (8 bytes)	☐ Float (8 bytes)	☐ Float (8 bytes)
☒ Type 8 (0)	☒ Type 8 (0)	☒ Type 8 (0)
☒ Type 9 (1)	☐ Type 9 (1)	☒ Type 9 (1)
☐ BLOB	☐ BLOB	☐ BLOB
☐ String	☐ String	☐ String
UTF-8	UTF-8	UTF-8
☐ Reversed byte order	☒ Reversed byte order	☐ Reversed byte order
UnixEpoch	UnixEpoch	UnixEpoch
☐ Set range	☐ Set range	☐ Set range
Min	Min Thursday, 01 January 2009 00:00:00	Min
Max	Max Monday, 29 April 2019 23:59:59	Max

Universal template

Column # 35 from 35

INTEGER	DATE	GAP
☒ Show in table	☒ Show in table	Min 0
extra_flags	date_real	Max 1
Serial types:	Serial types:	Serial types:
☒ Type 0 (NULL)	☐ Type 0 (NULL)	☒ Type 0 (NULL)
☒ Type 1 (1 byte)	☒ Type 1 (1 byte)	☒ Type 1 (1 byte)
☒ Type 2 (2 bytes)	☐ Type 2 (2 bytes)	☒ Type 2 (2 bytes)
☒ Type 3 (3 bytes)	☐ Type 3 (3 bytes)	☒ Type 3 (3 bytes)
☒ Type 4 (4 bytes)	☒ Type 4 (4 bytes)	☒ Type 4 (4 bytes)
☒ Type 5 (6 bytes)	☒ Type 5 (6 bytes)	☒ Type 5 (6 bytes)
☒ Type 6 (8 bytes)	☒ Type 6 (8 bytes)	☒ Type 6 (8 bytes)
☐ Float (8 bytes)	☐ Float (8 bytes)	☒ Float (8 bytes)
☒ Type 8 (0)	☒ Type 8 (0)	☒ Type 8 (0)
☒ Type 9 (1)	☐ Type 9 (1)	☒ Type 9 (1)
☐ BLOB	☐ BLOB	☒ BLOB
☐ String	☐ String	☒ String
UTF-8	UTF-8	UTF-8
☐ Reversed byte order	☒ Reversed byte order	☐ Reversed byte order
UnixEpoch	UnixEpoch	UnixEpoch
☐ Set range	☐ Set range	☐ Set range
Min	Min Thursday, 01 January 2009 00:00:00	Min
Max	Max Monday, 29 April 2019 23:59:59	Max

VALUE RANGE ADJUSTMENT

INTEGER	TEXT	DATE	INTEGER	INTEGER
☐ Show in table id	☒ Show in table address	☒ Show in table date	☒ Show in table read	☒ Show in table opened
Serial types: ☒ Type 0 (NULL) ☐ Type 1 (1 byte) ☐ Type 2 (2 bytes) ☐ Type 3 (3 bytes) ☐ Type 4 (4 bytes) ☐ Type 5 (6 bytes) ☐ Type 6 (8 bytes) ☐ Float (8 bytes) ☐ Type 8 (0) ☐ Type 9 (1) ☐ BLOB ☐ String	Serial types: ☐ Type 0 (NULL) ☐ Type 1 (1 byte) ☐ Type 2 (2 bytes) ☐ Type 3 (3 bytes) ☐ Type 4 (4 bytes) ☐ Type 5 (6 bytes) ☐ Type 6 (8 bytes) ☐ Float (8 bytes) ☐ Type 8 (0) ☐ Type 9 (1) ☒ BLOB ☒ String	Serial types: ☐ Type 0 (NULL) ☒ Type 1 (1 byte) ☐ Type 2 (2 bytes) ☐ Type 3 (3 bytes) ☒ Type 4 (4 bytes) ☒ Type 5 (6 bytes) ☒ Type 6 (8 bytes) ☐ Float (8 bytes) ☒ Type 8 (0) ☐ Type 9 (1) ☐ BLOB ☐ String	Serial types: ☐ Type 0 (NULL) ☒ Type 1 (1 byte) ☐ Type 2 (2 bytes) ☐ Type 3 (3 bytes) ☐ Type 4 (4 bytes) ☐ Type 5 (6 bytes) ☐ Type 6 (8 bytes) ☐ Float (8 bytes) ☒ Type 8 (0) ☒ Type 9 (1) ☐ BLOB ☐ String	Serial types: ☒ Type 0 (NULL) ☒ Type 1 (1 byte) ☒ Type 2 (2 bytes) ☒ Type 3 (3 bytes) ☒ Type 4 (4 bytes) ☒ Type 5 (6 bytes) ☒ Type 6 (8 bytes) ☐ Float (8 bytes) ☒ Type 8 (0) ☒ Type 9 (1) ☐ BLOB ☐ String
☐ Set range Min Max	☐ Set size Min Max ☐ Use regex	UTF-8 ☒ Reversed byte order UnixEpoch ☒ Set range Min Thursday, 01 January 2009 00:00:00 Max Monday, 29 April 2019 23:59:59	☒ Set range Min 0 Max 1	☐ Set range Min Max

Specify
field types

Set
range

MORE CLEAN DATA

1st template results

Carved data

Group by: None

☒	☐	rowid	address	date	read	opened	status
1	☒	1	+7988169	19.02.2014 05:36:28	0	0	
2	☒	2	+7988169	19.02.2014 17:20:23	0	0	
3	☒	3	+7988169	19.02.2014 17:21:37	0	0	
4	☒	4	+7988169	21.02.2014 14:37:41	0	0	
5	☒	5	+7988169	02.03.2014 09:35:02	0	0	
6	☒	6	+7988169	02.03.2014 09:35:26	0	0	
7	☒	7	+7988169	02.03.2014 09:36:16	0	0	
8	☒	8	+7988169	02.03.2014 13:03:18	0	0	
9	☒	9	+7988169	02.03.2014 13:28:37	0	0	
10	☒	10	+791854	08.03.2014 11:44:17	0	0	
11	☒	11	+7905429	09.03.2014 07:33:59	0	0	
12	☒	12	+7988169	09.03.2014 06:45:55	0	0	
13	☒	13	+7988169	09.03.2014 06:46:35	0	0	
14	☒	14	+7988169	09.03.2014 06:58:34	0	0	
15	☒	15	+7988169	09.03.2014 06:58:34	0	0	
16	☒	16	+7988169	09.03.2014 07:06:27	0	0	
17	☒	17	+7988169	09.03.2014 07:13:19	0	0	
18	☒	18	+7988169	09.03.2014 07:14:25	0	0	
19	☒	19	+7988169	09.03.2014 07:14:44	0	0	
20	☒	20	+7988169	09.03.2014 07:16:27	0	0	
21	☒	21	+7988169	09.03.2014 14:58:32	0	0	
22	☒	22	+7988169	09.03.2014 14:58:32	0	0	
23	☒	23	+7988169	10.03.2014 09:58:41	0	0	

Position 1 from 244

2nd template results

Carved data

Group by: None

☒	☐	rowid	address	date	read	opened	status
1	☒	91	+791840	12.05.2014 08:43:07	0	0	
2	☒	90	+791840	12.05.2014 08:43:00	0	0	
3	☒	89	+791840	12.05.2014 08:42:49	0	0	
4	☒	88	+791840	12.05.2014 08:42:04	0	0	
5	☒	87	+791840	12.05.2014 08:41:15	0	0	
6	☒	86	+791840	12.05.2014 08:40:22	0	0	
7	☒	85	+791840	12.05.2014 08:39:53	0	0	
8	☒	84	+791840	12.05.2014 08:39:11	0	0	
9	☒	81	+791840	12.05.2014 08:38:49	0	0	
10	☒	80	+791840	12.05.2014 08:38:34	0	0	
11	☒	240	+791840	11.07.2014 22:48:11	0	0	
12	☒	240	+791840	11.07.2014 22:48:11	0	0	
13	☒	246	+792814	16.09.2014 03:26:52	0	0	
14	☒	247	+791840	08.10.2014 20:43:01	0	0	
15	☒	248	+792885	27.10.2014 11:29:42	0	0	
16	☒	249	+792890	27.10.2014 14:33:00	0	0	
17	☒	250	+791840	31.10.2014 04:41:01	0	0	
18	☒	53	+791840	03.04.2014 04:48:39	0	0	
19	☒	254	Viber	31.12.2014 06:13:17	1	0	
20	☒	253	Viber	17.12.2014 13:55:02	1	0	
21	☒	252	Viber	26.11.2014 09:52:26	1	0	

Position 1 from 33

Universal template results

Carved data

Group by: None

☒	☐	rowid	address	date	read	opened	status	type	
1	☒	1	+7988169	19.02.2014 05:36:28	0	0	2	0	file:///storage/emulate
2	☒	2	+7988169	19.02.2014 17:20:23	0	0	2	1	file:///storage/emulate
3	☒	3	+7988169	19.02.2014 17:21:37	0	0	2	1	file:///storage/emulate
4	☒	4	+7988169	21.02.2014 14:37:41	0	0	2	0	file:///storage/emulate
5	☒	5	+7988169	02.03.2014 09:35:02	0	0	2	1	
6	☒	6	+7988169	02.03.2014 09:35:26	0	0	2	0	
7	☒	7	+7988169	02.03.2014 09:36:16	0	0	2	1	Я уже там
8	☒	8	+7988169	02.03.2014 13:03:18	0	0	2	0	file:///storage/emulate
9	☒	9	+7988169	02.03.2014 13:28:37	0	0	2	1	Это когда твоё корн
10	☒	10	+7918541	08.03.2014 11:44:17	0	0	2	1	outgoing_call
11	☒	11	+7905429	09.03.2014 07:33:59	0	0	2	1	outgoing_call
12	☒	12	+7988169	09.03.2014 06:45:55	0	0	2	1	outgoing_call
13	☒	13	+7988169	09.03.2014 06:46:35	0	0	2	0	incoming_call
14	☒	14	+7988169	09.03.2014 06:58:34	0	0	2	0	missed_call
15	☒	15	+7988169	09.03.2014 06:58:34	0	0	2	1	outgoing_call
16	☒	16	+7988169	09.03.2014 07:06:27	0	0	2	0	incoming_call
17	☒	17	+7988169	09.03.2014 07:13:19	0	0	2	1	file:///storage/emulate
18	☒	18	+7988169	09.03.2014 07:14:25	0	0	2	0	И сколько их
19	☒	19	+7988169	09.03.2014 07:14:44	0	0	2	1	101
20	☒	20	+7988169	09.03.2014 07:16:27	0	0	2	0	Молодец
21	☒	21	+7988169	09.03.2014 14:58:32	0	0	2	1	
22	☒	22	+7988169	09.03.2014 14:58:32	0	0	2	1	outgoing_call
23	☒	23	+7988169	10.03.2014 09:58:41	0	0	2	1	outgoing_call

Position 1 from 276

Now let's check how it works
in real world