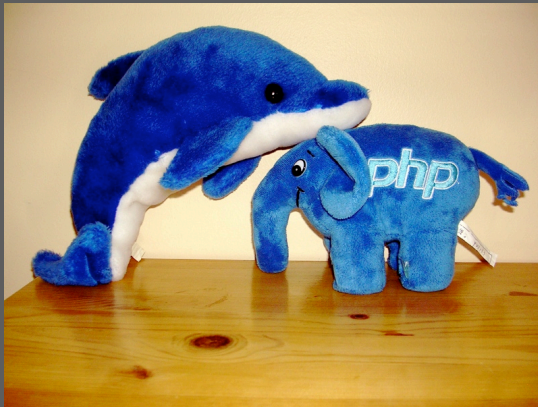




MySQL Hidden Treasures

Agenda

- **The easiest session of all**
- **Clever SQL recipes for MySQL**
- **Tweaking SQL queries**
 - **You know about MySQL**
 - **Really unexpected results ?**

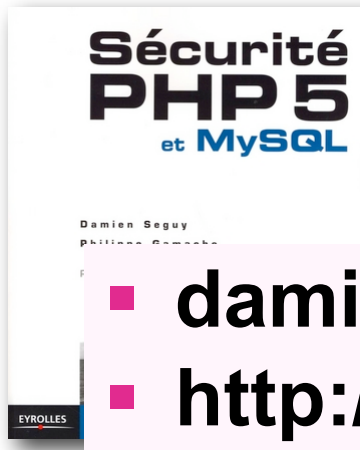
Agenda

- **Solve every day problems**
 - **Solved in SQL**
 - **Functionnality over speed**
 - **Speed over functionnality**
 - **May be solved from programming language**

Who's talking



- **Damien Séguy**
 - **Open Source service group**
 - **Expert services at nexenservices**



- **damien.seguy@nexen.net**
- **<http://www.nexen.net/english.php>**

Questions?

- Tricks are like good jokes
- Don't wait until it's too late



Funky sorting

- What sort of sort is that?

```
mysql> SELECT id, rank FROM mce_1  
        ORDER BY rank ASC;
```

id	rank	
1	first	
2	second	
3	third	
4	fourth	

Compact column

```
mysql> CREATE TABLE `mce_1` (  
  `id` tinyint(11) NOT NULL,  
  `rank` enum('first','second','third','fourth'),  
) ENGINE=MyISAM CHARSET=latin1;
```

- Enum is both a string and a number
- Internally used as an integer
- Displayed as string

Compact column

mysql	wheel	316K	Apr	15	19:23	test_enum.MYD
mysql	wheel	181K	Apr	15	19:23	test_enum.MYI
mysql	wheel	8K	Apr	15	19:22	test_enum.frm
mysql	wheel	110K	Apr	15	19:23	test_enum2.MYD
mysql	wheel	150K	Apr	15	19:23	test_enum2.MYI
mysql	wheel	71K	Apr	15	19:23	test_enum2.frm

- Compact storage
- Faster to search
- Include string parser
- Little sister is SET

Random order

- **Extract random rows from a table**
- **SQL help sorting, not mixing!**
 - **Lotery, random tests,**
 - **Cards dealing,**
 - **Genetic programming**

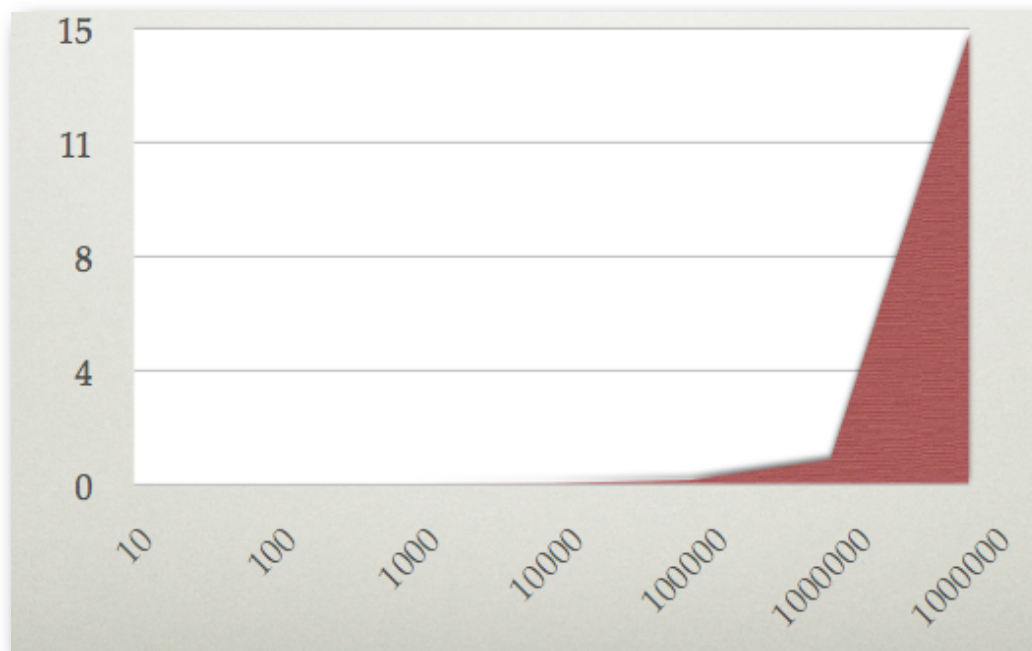
Adding chaos

```
mysql> SELECT i FROM integers  
ORDER BY RAND(1);
```

i
7
1
5
4
8
2
0
3
9
6

Speed of chaos

- Good for smaller tables
- Getting slower or luckier?



Indexed chaos?

- **Store RAND() in extra column and index it**
- **Still use ORDER BY**
- **Use LIMIT offset from main program**
- **Update table every other time**

Indexed chaos

```
mysql> SELECT col FROM tbl ORDER BY chaos LIMIT 10;  
Query OK, 10 rows affected (0.00 sec)
```

```
mysql> ALTER TABLE tbl ADD INDEX(x);  
Query OK, 10000000 rows affected (28.69 sec)
```

```
mysql> UPDATE tbl SET chaos=RAND();  
Query OK, 10000000 rows affected (3 min 40.53 sec)
```

Random extraction

```
mysql> SELECT id, col FROM table JOIN  
        (SELECT CEIL(RAND() *  
                (SELECT MAX(id) FROM table)) AS r)  
        AS r2 ON id = r;
```

- Deepest sub-query is type const
- Sub-query do not use table
- id is an positive integer column
- auto_increment but continuous

Random extractions

```
mysql> SELECT id, col FROM table JOIN  
        (SELECT CEIL(RAND() *  
                (SELECT MAX(i) FROM integers)) as r  
         FROM integers limit 3)  
        AS r2 ON id = r;
```

- Using an integers table for loop

Integers table

- One common tool for data
- Generate values
- Make SQL loops
- Check for missing values

```
mysql> SHOW CREATE TABLE integers;
```

```
+-----+  
| CREATE TABLE |  
+-----+  
| CREATE TABLE `integers` (  
|   `i` tinyint(3) DEFAULT NULL  
| ) ENGINE=MyISAM DEFAULT CHARSET=latin1  
+-----+
```

```
1 row in set (0.00 sec)
```

```
mysql> INSERT INTO integers
```

```
VALUES (0),(1),(2),(3),(4),(5),(6),(7),(8),(9);
```


Integer generation

```
mysql> SELECT 10 * d.i + u.i  
FROM      integers u  
CROSS JOIN integers d;
```

```
+-----+  
| 10 * d.i + u.i |  
+-----+  
|                0 |  
|                1 |  
// .....  
|                98 |  
|                99 |  
+-----+
```

100 rows in set (0.00 sec)

10000000 rows in set (13.17 sec)

Generating alphabet

```
mysql> SELECT d.i * 10 + u.i AS counter,  
            SUBSTR('abcdefghijklmnopqrstuvwxyz',  
                  -1 (d.i * 10 + u.i), 1) AS letter  
FROM integers u, integers d  
WHERE d.i * 10 + u.i BETWEEN 1 AND 26;
```

- substring
- between

18	i
19	h
20	g
21	f
22	e
23	d
24	c
25	b
26	a

+-----+-----+
26 rows in set (0.00 sec)

Generating text

```
mysql> SELECT  
      i,  
      CHAR(15108241 + i) AS ideogramm  
FROM integers u WHERE i < 6;
```

i	ideogramm
0	我
1	戒
2	或
3	菱
4	戕
5	戕

Generating text

```
mysql> SELECT group_concat(  
    concat(elt(rand() * 6, 'a','e','i','o','u','y'),  
        char(rand() * 25 + 97))  
        SEPARATOR ' ' ) AS word  
    FROM integers AS l  
        JOIN integers AS w  
    WHERE l.i < rand() * 9 + 1  
    GROUP BY w.i;
```

```
mysql> SELECT group_concat(  
    word SEPARATOR ' ' ) as sentence  
    FROM ( **Query_above** ) as sub;
```

word
yhumiseg
uieyeu
ouao
ebecex
obecop
amobizosoq
uqamuruy
iduluyub

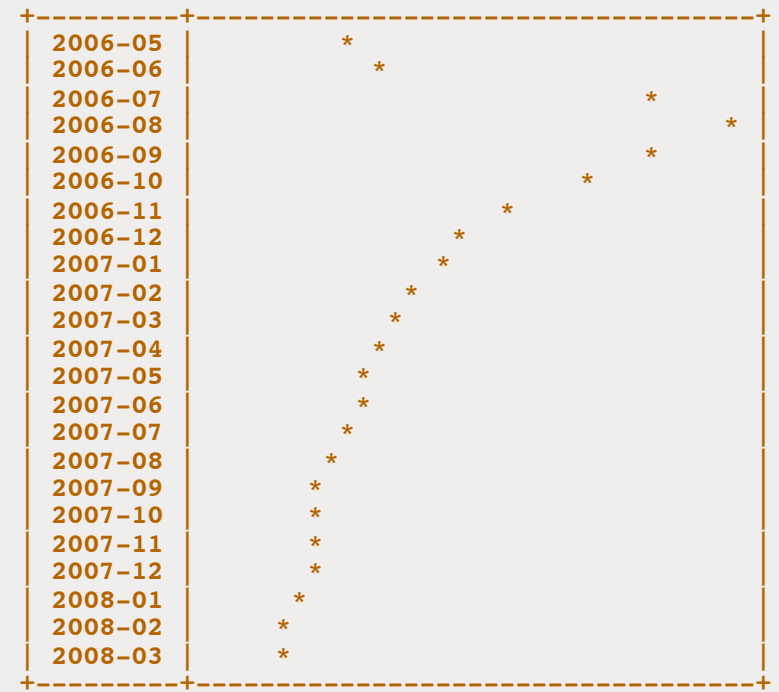
Ascii art

```
mysql> SELECT version,  
              REPEAT('*', percentage * 2) AS bars  
FROM php_versions;
```

libelle	bars
4.0	*
4.1	**
4.2	*
4.3	*****
4.4	*****
4.5	
5.0	**
5.1	*****
5.2	*****
5.3	
6.0	

Quick graphs

```
mysql> SELECT
    date_format(period, '%Y-%m') as period,
    percentage,
    CONCAT(REPEAT(' ',percentage * 5),'*') chart
  FROM VersionEvolution
 WHERE version = '5.1.4'
 ORDER BY
    version,
    period;
```



Fractascii?

http://
forge.mysql.com/
tools/tool.php?
id=25

```
mysql> CALL mandelbrot (50,20);
```

content

20 rows in set (0.11 sec)

Group_concat

- **GROUP_CONCAT**
 - **concat() and concat_ws()**
now for groups
- **ORDER BY**
- **SEPARATOR**
- **Limited to 1kb by default**
 - **Change group_concat_max_len**

Group_concat example

```
mysql> SELECT region.name,  
group_concat(region2.name  
              ORDER BY region.name  
              SEPARATOR ', ') subregions  
FROM region JOIN region AS region2  
ON region.id = region2.in  
GROUP BY region.name ORDER BY region.name;
```

name	subregions
California	Orange, San Francisco, Santa Clara
Canada	Alberta, Ontario, Quebec
Countries	Canada, Mexico, USA
USA	Arizona, California, Utah

Second last of Mohican

```
mysql> SELECT region.name,  
      min(region2.name) as first,  
      mid(group_concat(region2.name  
        ORDER BY region.name  
        SEPARATOR ', '), length(min(region2.name)) + 3 ,  
      locate( ',', concat(group_concat(region2.name  
        ORDER BY region.name  
        SEPARATOR ', ')) ,length(min(region2.name)) + 2 )  
      - length(min(region2.name)) - 2 ) as second  
FROM mce_regions region JOIN mce_regions AS region2  
ON region.id = region2.in  
GROUP BY region.name  
ORDER BY region.name;
```

name	first	second
California	Orange	San Francisco
Canada	Alberta	Ontario
Countries	Canada	Mexico
USA	Arizona	California

Second last of Mohican

```
mysql> SELECT region.name,  
      min(region2.name) as first,  
      mid(group_concat(region2.name  
        ORDER BY region.name  
        SEPARATOR ', '), length(min(region2.name)) + 3 ,  
      locate( ',', concat(group_concat(region2.name  
        ORDER BY region.name  
        SEPARATOR ', ')) ,length(min(region2.name)) + 2 )  
      - length(min(region2.name)) - 2 ) as second  
FROM mce_regions region JOIN mce_regions AS region2  
ON region.id = region2.in  
GROUP BY region.name  
ORDER BY region.name;
```

name	first	second
California	Orange	San Francisco
Canada	Alberta	Ontario
Countries	Canada	Mexico
USA	Arizona	California

Second last of Mohican

```
mysql> SELECT region.name,  
      min(region2.name) as first,  
      mid(group_concat(region2.name  
        ORDER BY region.name  
        SEPARATOR ', '), length(min(region2.name)) + 3 ,  
      locate( ',', concat(group_concat(region2.name  
        ORDER BY region.name  
        SEPARATOR ', ')) ,length(min(region2.name)) + 2 )  
      - length(min(region2.name)) - 2 ) as second  
FROM mce_regions region JOIN mce_regions AS region2  
ON region.id = region2.in  
GROUP BY region.name  
ORDER BY region.name;
```

name	first	second
California	Orange	San Francisco
Canada	Alberta	Ontario
Countries	Canada	Mexico
USA	Arizona	California

Rankings

```
mysql> SELECT country, php
        FROM statsPHPcountry2
        ORDER BY php DESC;
```

country	php
F. Polynesia	74
Vanuatu	68
USA	32
Israel	32
Greenland	21

- Who is the first?
- Who is the second?
- Who is the n-th?
- And ex-aequos?

MySQL Variables

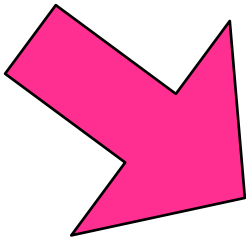
```
mysql> SET @var := 3;
mysql> SELECT @var;
+-----+
| @var |
+-----+
| 3    |
+-----+

mysql> SELECT @var := 4;
+-----+
| @var := 4 |
+-----+
|          4 |
+-----+
```

- Store scalar values
- Reuse results in later queries

Cleaner SQL queries

```
mysql> SELECT SUM(number)
        FROM statsPHPraw;
// get 10107060 in a variable
mysql> INSERT INTO statsPHPversions
        SELECT version, number / 10107060 * 100
        FROM statsPHPraw;
```



```
mysql> SELECT @total := SUM(number)
        FROM statsPHPraw ;
mysql> INSERT INTO statsPHPversions
        SELECT version, number / @total * 100
        FROM statsPHPraw;
```

Ranking

```
mysql> SET @rank := 1;
mysql> SELECT @rank := @rank + 1 AS rank,
               country, php FROM statsPHPcountry2
               ORDER BY php DESC;
```

rank	country	php
1	F. Polynesia	74
2	Vanuatu	68
3	USA	32
4	Israel	32
5	Greenland	21

Ex-aequos

```
mysql> SET @rank := 1, @prev := NULL;
mysql> SELECT
  @rank := if(@prev=php, @rank, @rank+ 1) AS rank,
  country, @prev:= php AS php
  FROM statsPHPcountry2
  ORDER BY php DESC;
```

rank	country	php
1	F. Polynesia	74
2	Vanuatu	68
3	Israel	32
3	USA	32
4	Greenland	21

Final ranking

```
mysql> SET @num := 0, @rank := 1, @prev := NULL;
mysql> SELECT LEAST(@num := @num + 1,
    @rank := if(@prev != php, @num, @rank)) AS rank,
    country, @prev := php AS php
    FROM statsPHPcountry2
    ORDER BY php DESC;
```

rank	country	php
1	F. Polynesia	74
2	Vanuatu	68
3	Israel	31
3	USA	31
5	Greenland	21

Agile Loading

```
mysql> SET @i := 0;
mysql> LOAD DATA INFILE '/tmp/stats.txt'
      INTO TABLE statPHPload
      (@date, @php, @country, @continent)
      SET
        id = 0,
        period = date(STR_TO_DATE(@date, '%d-%b-%y')),
        rank = (@i := @i + 1),
        php = CAST( REPLACE(@php, ',', '.') as DECIMAL),
        country = @country;
```

Hidden treasures

- **Random access to tables**
- **group_concat()**
- **Integer table**
- **MySQL variables**
- **Some extra functions**

Thank you



- <http://www.alterway.fr/>
- damien.seguy@nexen.net
- <http://www.nexen.net/conferences.php>

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Alter Way GROUP