## Jason-W2-20220623 pacman & sqlite 資料庫指令

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#### Arch Linux:套件管理工具 pacman

- 1. 在以git shell操作之前,要以系統管理員身份進入git bash (git bash 右鍵點選"以系統管理員身份"執行)
- 2. 以最新的 webui-dist來操作 git clone https://github.com/wade-fs/webui-dist
- 3. 進入根目錄 cd/
- 4. 對pacman.tgz,進行解壓縮(tar-xf[解壓縮檔名]) tar xf~/desktop/webui-dist/pacman.tgz
- 5. 確認pacman 能執行 pacman --version



#### Pacman 功能種類

- 1. Search for packages with *pacman*
- 2. Search for packages with *pacman*
- 3. List installed packages with *pacman*
- 4. Install packages with *pacman*
- 5. Updating and Upgrading with *pacman*
- 6. Removing packages with *pacman*

-以下將以SQLite來當作搜尋、安裝、移除的範例

### Pacman – Search

pacman -Ss <package-name>

pacman -Ss sqlite

```
MINGW64:/
                                                                                  ser@DESKTOP-OGU3U94 MINGW64 /
 pacman -Ss sqlite
 ingw32/mingw-w64-i686-libspatialite 5.0.1-5
   SQLite extension to support spatial data types and operations (mingw-w64)
ningw32/mingw-w64-i686-lua51-lsqlite3 0.9.5-2
   LuaSQLite is a Lua 5 binding to allow users/developers to manipulate SQLite
   2 and SQLite 3 databases (through different implementations) from lua
mingw32/mingw-w64-i686-python-sqlitedict 2.0.0-1
   Persistent dict, backed by sqlite3 and pickle, multithread-safe (mingw-w64)
ningw32/mingw-w64-i686-sqlcipher 4.5.1-1
    SQLite extension that provides transparent 256-bit AES encryption of
   database files
 ingw32/mingw-w64-i686-sqlite-docs 3.38.5-1
   A C library that implements an SQL database engine (mingw-w64)
   (documentation)
ringw32/mingw-w64-i686-sqlite3 3.38.5-1 [installed]
   A C library that implements an SQL database engine (mingw-w64)
 ingw32/mingw-w64-i686-sqlitebrowser 3.12.2-3
   SQLite Database browser is a Qt GUI editor for SQLite databases (mingw-w64)
mingw32/mingw-w64-i686-virtualpg 2.0.1-1
   A loadable dynamic extension module to both SQLite and SpatiaLite
   implementing VirtualPostgres (direct SQL cross access to PostgreSQL/PostGIS
   tables) (mingw-w64)
 ingw64/mingw-w64-x86_64-libspatialite 5.0.1-5
   SQLite extension to support spatial data types and operations (mingw-w64)
mingw64/mingw-w64-x86 64-lua51-lsglite3 0.9.5-2
   LuaSQLite is a Lua 5 binding to allow users/developers to manipulate SQLite
   2 and SQLite 3 databases (through different implementations) from lua
   (mingw-w64)
 ringw64/mingw-w64-x86_64-python-sqlitedict 2.0.0-1
   Persistent dict, backed by sqlite3 and pickle, multithread-safe (mingw-w64)
mingw64/mingw-w64-x86_64-sqlcipher 4.5.1-1
   SQLite extension that provides transparent 256-bit AES encryption of
   database files
 ingw64/mingw-w64-x86_64-sqlite-docs 3.38.5-1
   A C library that implements an SQL database engine (mingw-w64)
   (documentation)
ringw64/mingw-w64-x86_64-sqlite3 3.38.5-1 [installed]
   A C library that implements an SQL database engine (mingw-w64)
mingw64/mingw-w64-x86_64-sqlitebrowser 3.12.2-3
   SQLite Database browser is a Qt GUI editor for SQLite databases (mingw-w64)
ningw64/mingw-w64-x86_64-virtualpg 2.0.1-1
   A loadable dynamic extension module to both SQLite and SpatiaLite
   implementing VirtualPostgres (direct SQL cross access to PostgreSQL/PostGIS
```

### Pacman – Install

pacman -S <package-name>
pacman -S sqlite

```
MINGW64:/
 Jser@DESKTOP-OGU3U94 MINGW64 /
$ pacman -S sqlite
resolving dependencies...
looking for conflicting packages...
Packages (1) sqlite-3.38.5-1
Total Download Size: 1.13 MiB
Total Installed Size: 6.63 MiB
:: Proceed with installation? [Y/n] y
warning: no /var/cache/pacman/pkg/ cache exists, creating...
:: Retrieving packages...
sqlite-3.38.5-1-x86_64 1160.5 KiB 435 KiB/s 00:03 [#######################] 100%
(1/1) checking keys in keyring
(1/1) checking package integrity
(1/1) loading package files
                                                      [##############################
                                                                                   100%
(1/1) checking for file conflicts
                                                      [#############################<u></u>]
(1/1) checking available disk space
                                                      [###################### 100%
:: Processing package changes...
(1/1) installing sqlite
                                                      [########## 100%
Optional dependencies for sqlite
    sqlite-extensions: various extensions for the SQL database engine 3.38.5
```

## Pacman – List installed packages

#### pacman -Q

```
MINGW64:/
                                                                                  ser@DESKTOP-OGU3U94 MINGW64 /
$ pacman -Q
apr 1.7.0-1
apr-util 1.6.1-1
asciidoc 9.1.1-1
autoconf-wrapper 15-1
autoconf2.13 2.13-5
autoconf2.69 2.69-2
autoconf2.71 2.71-1
autogen 5.18.16-3
automake-wrapper 11-4
automake1.10 1.10.3-5
automake1.11 1.11.6-6
automake1.12 1.12.6-6
automake1.13 1.13.4-7
automake1.14 1.14.1-6
automake1.15 1.15.1-4
automake1.16 1.16.5-1
automake1.6 1.6.3-4
automake1.7 1.7.9-4
automake1.8 1.8.5-5
automake1.9 1.9.6-4
bash 4.4.023-1
bash-completion 2.11-2
binutils 2.37-5
bison 3.8.2-3
bsdcpio 3.6.1-2
bsdtar 3.6.1-2
bzip2 1.0.8-3
ca-certificates 20211016-1
coreutils 8.32-2
crypt 1.4-1
curl 7.83.1-1
dash 0.5.11.5-2
diffstat 1.64-1
diffutils 3.8-3
docbook-xml 4.5-4
docbook-xsl 1.79.2-3
docbook-xsl-ns 1.79.2-2
docx2txt 1.4-1
dos2unix 7.4.3-1
expat 2.4.8-1
```

## Pacman – Update & Upgrade

### pacman –Syy

(Update)

```
User@DESKTOP-OGU3U94 MINGW64
$ pacman -Syy
:: Synchronizing package databases...
git-for-windows
                          46.8 KiB 47.4 KiB/s 00:01 [###########################
git-for-windows-mingw32
                          16.5 KiB 19.8 KiB/s 00:01
                                                    [########################
                                                                                 100%
                                                    [############################
mingw32
                        1614.0 KiB
                                     212 KiB/s 00:08
                                                                                 100%
mingw64
                        1623.2 KiB
                                     338 KiB/s 00:05
                                                    [#########################
                                                                                 100%
ucrt64
                        1681.1 KiB
                                     731 KiB/s 00:02
                                                    [########################
                                                                                 100%
clang32
                        1580.7 KiB
                                                    [########################
                                                                                 100%
                                     644 KiB/s 00:02
                                     290 KiB/s 00:06 [#######################
clang64
                        1612.5 KiB
                                                                                 100%
                                     144 KiB/s 00:03 [################### 100%
msys
                         394.3 KiB
```

# pacman –Syu

(Upgrade)

```
ser@DESKTOP-OGU3U94 MINGW64 /
: Synchronizing package databases...
git-for-windows is up to date
git-for-windows-mingw32 is up to date
mingw32 is up to date
mingw64 is up to date
ucrt64 is up to date
clang32 is up to date
clang64 is up to date
msys is up to date
:: Starting core system upgrade...
varning: bash: ignoring package upgrade (4.4.023-1 => 4.4.023-2)
there is nothing to do
:: Starting full system upgrade...
resolving dependencies...
looking for conflicting packages...
Packages (11) mingw-w64-i686-boost-1.79.0-4 mingw-w64-i686-brotli-1.0.9-5
             mingw-w64-i686-gdb-12.1-2 mingw-w64-i686-libxml2-2.9.14-4
             mingw-w64-i686-python-3.10.5-1 mingw-w64-x86_64-brotli-1.0.9-5
             mingw-w64-x86_64-gdb-12.1-2 mingw-w64-x86_64-git-2.37.0.rc1.windows.1-1
             mingw-w64-x86_64-git-doc-html-2.37.0.rc1.windows.1-1
             mingw-w64-x86_64-libxml2-2.9.14-4 mingw-w64-x86_64-python-3.10.5-1
Total Download Size:
                       69.81 MiB
Total Installed Size: 518.44 MiB
                        5.47 MiB
Net Upgrade Size:
  Proceed with installation? [Y/n] n
```

#### Pacman – Remove

- pacman -Rcns <package-name>
- pacman -Rcns sqlite

```
User@DESKTOP-OGU3U94 MINGW64 /
$ pacman -Rcns sqlite
checking dependencies...

Packages (1) sqlite-3.38.5-1

Total Removed Size: 6.63 MiB

:: Do you want to remove these packages? [Y/n] y
:: Processing package changes...
(1/1) removing sqlite [####################] 100%
```

## git shell 中管理 q8s.db

- 1. 進入webui-dist 資料夾 cd ~/desktop/webui-dist
- 2. 以sqlite3 打開q8s.db sqlite3 q8s.db
- 3. 查看q8s.db 中的tables .tables

```
Jser@DESKTOP-OGU3U94 MINGW64 /
$ cd ~/desktop/webui-dist
 ser@DESKTOP-OGU3U94 MINGW64 ~/desktop/webui-dist (main)
$ sqlite3 q8s.db
SQLite version 3.38.5 2022-05-06 15:25:27
Enter ".help" for usage hints.
sqlite> .tables
ads
               dhcp
                               log_terminal
                                              term_schedule
               license
                               rds
                                              termovr
               log_server
                               term
```

## git shell 中管理 q8s.db

4. 要查看各種不同tables裡面的資料 select \* from [table 名稱]; (\*查看全部資料)

```
MINGW64:/c/Users/User/Desktop/webui-dist
User@DESKTOP-0GU3U94 MINGW64 ~/Desktop/webui-dist (main)
$ sqlite3 q8s.db
SQLite version 3.38.5 2022-05-06 15:25:27
Enter ".help" for usage hints.
sqlite> .tables
                                log_terminal
                                                term schedule
                license
                                rds
                                                 termovr
                log_server
                                term
sqlite> select * from term;
2928 | 1 | 1.0 | 0 | IFHotkeyCode | DOWN | string
2929|1|1.0|0|Manufacturer|Arista|string
2930|1|1.0|0|NumberOfMonitors|1|int
2931|1|1.0|0|ScrollDown||string
2932|1|1.0|0|Name|t1|string
```

## git shell 中管理 q8s.db

5. 但只出現資料卻不知這些資料代表什麼意義,就要用.schema 來看資料的定義

.schema [table 名稱]

sqlite> .schema term

CREATE TABLE term ( Id INTEGER PRIMARY KEY AUTOINCREMENT, ObjId INTEGER DEFAULT 1, Major TEXT DEFAULT '1.0', Minor TEXT DEF
 '0', Attr TEXT DEFAULT 'UNKNOWN', Val TEXT DEFAULT 'UNKNOWN', Typ TEXT DEFAULT 'UNKNOWN', UNIQUE(ObjId,Attr));

^Clite> ^C
User@DESKTOP-OGU3U94 MINGW64 ~/Desktop/webui-dist (main)

\$ |

所以其實q8s.db中 term tables的一部分,用表格看起來是長得像右邊這樣。

Id	ObjId	Major	Minor	Attr	Val	Тур
2928	1	1.0	0	IFHotkeyCodel	Down	string
2929	1	1.0	0	Manufacturer	Arista	string

6. 退出sqlite .exit

## auto test api

- 1. 請閱讀 docs/test-api.md
- 2. 配合上面的 sqlite3 了解資料庫

### auto test api

• 目前藉由sqlite 中.tables 指令 可得知在q8s.db中的所有table (如下右圖) 與docs/test-api.md中描述的吻合(如下左圖)

```
## 表格
                                                       User@DESKTOP-OGU3U94 MINGW64 ~/Desktop/webui-dist (main)
                                                      SQLite version 3.38.5 2022-05-06 15:25:27
- API: /test/ids/:tb
                                                      Enter ".help" for usage hints.
  常用的表格有 term, rds, app,
                                                      sqlite> .tables
                                                                                     log_terminal
                                                                                                     term_schedule
 log 相關: log terminal, log server
                                                                      dhcp
                                                                      license
                                                                                     rds
 其它: license, termovr, term schedule, dhcp, auth, ads
                                                                      log_server
                                                                                     term
```

那在瀏覽器的url也能夠輸入/test 的相關指令來看到資料庫中的table資料

- 1. Table 中的資料有幾個id API: /test/ids/[table 名稱]
  (例如:http://localhost:8088/test/ids/term) → [1, 2] 因為目前terminal只有 t1 與 t2
- 2. Table 中的所有item API: /test/items/[table 名稱] → 等於取得table 中所有細節資料
- 3. 只顯示table 中特定id 的item API: /test/item/[table 名稱] /[id代號]
  (例如: http://localhost:8088/test/item/term/1) → 就只會顯示term中 id = 1的 item

### auto test api

4. 取得terminal的status (通常是指目前有哪些terminal 正在運作,要先用 ./terminal.sh -s -M 112233445561 -S ACTIVE 來控制使termianl 的狀態變成active

然後API: /test/status/

http://localhost:8088/test/status/

```
{
    "112233445561": {
        "Id": 1,
        "Ip": "127.0.0.1",
        "Manu": "",
        "Model": "",
        "Class": "",
        "Status": "ACTIVE",
        "Last": 1655635208
    }
}
```

5.取得 status 中占 license 的 terminal 及 max license

API: /test/licensed/

http://localhost:8088/test/licensed/

```
{
    "112233445561": "127.0.0.1",
    "MaxLicenses": "10"
}
```

[問題1]以表格term來說,像tid=1,照文件操作時,如果是t1,在資料庫中要如何查這筆資料?

答案:select \* from term where objId = 1

#### [問題2.1] 為什麼表格是這樣設計(vertical table)

答案:在webui 中會有很多新增terminal 與 app ...等等不固定的新增資料,若使用水平式,那在新增新一列資料時,UI的顯示可能需要跟著做調整,此時使用垂直式設計,資料藉由id以邏輯形式連繫在一起,就不用做UI上的更動。

#### [問題2.2] 這樣設計有什麼優點與缺點?

答案: vertical table 的優點在於,靈活性好、顯示數據分類便利、 速度比horizon table快,缺點在於,數據規範化難維護、易讀性差、 操作sql 語法較複雜,但可用一個函式同時對所有表格實行相同操作。

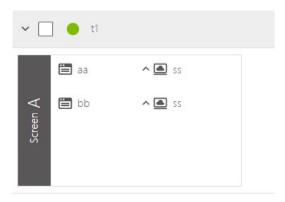
- [問題3] 請編輯terminal中的display,使下面變數進行資料取出,並報告不同變數與 原始的差異
  - (1) app數從1到2 (ps: 要先建共3個app)
  - (2) monitor數由1到2, screen個數維持1個,擺放2個app
  - (3)screen數由1到2,保持monitor數為2,每個screen擺一個app
  - (4)第2個screen放2個app

#### 原始狀況



```
"MAC": "112233445561",
 "MainMenu": "NONE",
 "MainMenuHotkeyCode": "F1",
 "MainMenuHotkeyState": "CTRL",
 "MainMonitor": 1.
 "Manufacturer": "Arista",
 "Model": "BoxPC-138-G01",
 "ModifiedTS": 1654916655,
 "Monitor1 ScreenId": 1,
 "Monitor1 Video": "1024x768,16M,60Hz",
 "Monitor1 XPosition": 0.
 "Monitor1 YPosition": 0,
 "Monitor2 ScreenId": 2,
 "Monitor2 Video": "1024x768,16M,60Hz",
 "Monitor2 XPosition": 1024,
 "Monitor2 YPosition": 0,
 "Monitor3 ScreenId": 2,
 "Monitor3 Video": "1024x768,16M,60Hz",
 "Monitor3 XPosition": 2048,
 "Monitor3 YPosition": 0,
 "Name": "t1",
 "NeedToRestart": false,
 "NumberOfMonitors": 1,
 "NumberOfScreens": 1.
 "ParentId": 0,
 "Password": "",
 "RebootDependentTerminals": false,
 "Replaceable": true,
 "RightMouseButton": "",
 "Schedules": "",
"Screen1 Applications": "1",
 "Screen1 EnableTiling": true,
 "Screen1 Height": 768,
 "Screen1 TileOnStartup": true,
 "Screen1 Width": 1024,
 "Screen1 XPosition": 0,
 "Screen1 YPosition": 0,
 "Screen2 Applications": "2,3",
 "Screen2 EnableTiling": true,
 "Screen2 Height": 768,
 "Screen2 TileOnStartup": true,
 "Screen2 Width": 2048,
 "Screen2 XPosition": 1024,
"Screen2 YPosition": 0,
"ScreenOfAppIds": "1",
 "ScrollDown": "",
 "ScrollUp": "",
 "ShadowMode": "YES",
 "ShowDeviceStatusBar": false,
 "Status": "OFF",
```

#### (1) app數從1到2



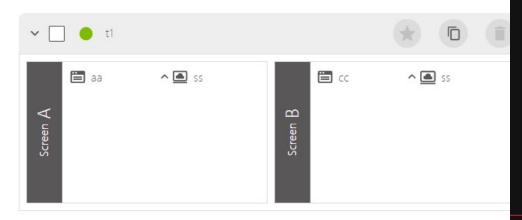
```
"Monitor1 XPosition": 0,
"Monitor1 YPosition": 0,
"Monitor2 ScreenId": 2,
"Monitor2 Video": "1024x768,16M,60Hz",
"Monitor2 XPosition": 1024,
"Monitor2 YPosition": 0,
"Monitor3 ScreenId": 2,
"Monitor3 Video": "1024x768,16M,60Hz",
"Monitor3 XPosition": 2048,
"Monitor3 YPosition": 0,
"Name": "t1".
"NeedToRestart": false,
"NumberOfMonitors": 1,
"NumberOfScreens": 1,
"ParentId": 0,
"Password": "",
"RebootDependentTerminals": false,
"Replaceable": true,
"RightMouseButton": "",
"Schedules": "",
"Screen1 Applications": "1,2",
"Screeni EnableTiling": true,
"Screen1 Height": 768,
"Screen1 TileOnStartup": true,
"Screen1 Width": 1024,
"Screen1 XPosition": 0,
"Screen1 YPosition": 0,
"Screen2 Applications": "3",
"Screen2 EnableTiling": true,
"Screen2 Height": 768,
"Screen2 TileOnStartup": true,
"Screen2 Width": 2048,
"Screen2 XPosition": 1024,
"Screen2 YPosition": 0,
"ScreenOfAppIds": "1,2",
"ScrollDown": "",
"ScrollUp": "",
"ShadowMode": "YES".
```

(2) monitor數由1到2, screen個數維持1個,擺 放2個app



```
"LogOnRelevanceUser": "NONE",
"MAC": "112233445561",
"MainMenu": "NONE",
"MainMenuHotkeyCode": "F1",
"MainMenuHotkeyState": "CTRL",
"MainMonitor": 1,
"Manufacturer": "Arista".
"Model": "BoxPC-138-G01",
"ModifiedTS": 1654916655,
"Monitor1 ScreenId": 1,
"Monitor1 Video": "1024x768,16M,60Hz",
"Monitor1 XPosition": 0,
"Monitor1 YPosition": 0,
"Monitor2 ScreenId": 1,
"Monitor2 Video": "1024x768,16M,60Hz",
"Monitor2 XPosition": 1024,
"Monitor2 YPosition": 0,
"Monitor3 ScreenId": 2,
"Monitor3 Video": "1024x768,16M,60Hz",
"Monitor3 XPosition": 2048,
"Monitor3_YPosition": 0,
"Name": "t1",
"NeedToRestart": false,
"NumberOfMonitors": 2,
"NumberOfScreens": 1,
"ParentId": 0,
"Password": "",
"RebootDependentTerminals": false,
"Replaceable": true,
"RightMouseButton": "",
"Schedules": "",
"Screen1 Applications": "1,2",
"Screen1 EnableTiling": true,
"Screen1 Height": 768,
"Screen1 TileOnStartup": true,
"Screen1 Width": 2048,
"Screen1 XPosition": 0,
"Screen1 YPosition": 0,
"Screen2 Applications": "3",
"Screen2 EnableTiling": true,
"Screen2 Height": 768,
"Screen2 TileOnStartup": true,
"Screen2 Width": 2048,
"Screen2 XPosition": 1024,
"Screen2 YPosition": 0,
"ScreenOfAppIds": "1,2",
"ScrollDown": "",
"ScrollUp": "",
"ShadowMode": "YES",
```

(3) screen數由1到2,保 持monitor數為2,每個 screen擺一個app



```
"LogOnRelevanceUser": "NONE",
"MAC": "112233445561",
"MainMenu": "NONE",
"MainMenuHotkeyCode": "F1",
"MainMenuHotkeyState": "CTRL",
"MainMonitor": 1,
"Manufacturer": "Arista",
"Model": "BoxPC-138-G01",
"ModifiedTS": 1654916655,
"Monitor1 ScreenId": 1,
"Monitor1 Video": "1024x768,16M,60Hz",
"Monitor1 XPosition": 0,
"Monitor1 YPosition": 0,
"Monitor2 ScreenId": 2,
"Monitor2 Video": "1024x768,16M,60Hz",
"Monitor2 XPosition": 1024,
"Monitor2 YPosition": 0,
"Monitor3 ScreenId": 2,
"Monitor3 Video": "1024x768,16M,60Hz",
"Monitor3 XPosition": 2048,
"Monitor3_YPosition": 0,
"Name": "t1",
"NeedToRestart": false,
"NumberOfMonitors": 3,
"NumberOfScreens": 2,
"ParentId": 0,
"Password": "",
"RebootDependentTerminals": false,
"Replaceable": true,
"RightMouseButton": "",
"Schedules": "".
"Screen1 Applications": "1",
"Screen1 EnableTiling": true,
"Screen1 Height": 768,
"Screen1 TileOnStartup": true,
"Screen1 Width": 1024,
"Screen1 XPosition": 0,
"Screen1 YPosition": 0,
"Screen2 Applications": "2",
"Screen2 EnableTiling": true,
"Screen2 Height": 768,
"Screen2 TileOnStartup": true,
"Screen2 Width": 2048,
"Screen2 XPosition": 1024,
"Screen2 YPosition": 0,
"ScreenOfAppIds": "1:2",
"ScrollDown": "",
"ScrollUp": "",
"ShadowMode": "YES",
```

#### (4)第2個screen放2個app



```
"LogOnRelevanceUser": "NONE",
"MAC": "112233445561",
"MainMenu": "NONE",
"MainMenuHotkeyCode": "F1",
"MainMenuHotkeyState": "CTRL",
"MainMonitor": 1,
"Manufacturer": "Arista".
"Model": "BoxPC-138-G01",
"ModifiedTS": 1654916655,
"Monitor1 ScreenId": 1,
"Monitor1 Video": "1024x768,16M,60Hz",
"Monitor1 XPosition": 0,
"Monitor1 YPosition": 0.
"Monitor2 ScreenId": 2,
"Monitor2 Video": "1024x768,16M,60Hz",
"Monitor2 XPosition": 1024,
"Monitor2 YPosition": 0,
"Monitor3 ScreenId": 2,
"Monitor3 Video": "1024x768,16M,60Hz",
"Monitor3 XPosition": 2048,
"Monitor3 YPosition": 0,
"Name": "t1",
"NeedToRestart": false,
"NumberOfMonitors": 3,
"NumberOfScreens": 2,
"ParentId": 0,
"Password": "",
"RebootDependentTerminals": false,
"Replaceable": true,
"RightMouseButton": "",
"Schedules": "",
"Screen1 Applications": "1",
"Screen1 EnableTiling": true,
"Screen1 Height": 768,
"Screen1 TileOnStartup": true,
"Screen1 Width": 1024,
"Screen1 XPosition": 0,
"Screen1 YPosition": 0,
"Screen2 Applications": "2,3",
"Screen2 EnableTiling": true,
"Screen2 Height": 768,
"Screen2 TileOnStartup": true,
"Screen2 Width": 2048,
"Screen2 XPosition": 1024,
"Screen2 YPosition": 0,
"ScreenOfAppIds": "1;2,3",
"ScrollDown": "",
"ScrollUp": "",
"ShadowMode": "YES",
```