

Android Debug Bridge: ADB

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Introdución

- O **Android Debug Bridge ADB** é unha utilidade que permite comunicarse cun dispositivo virtual ou real.
- Esta composto dun servidor que sempre está funcionando no ordenador real e lánzase cando se inicia Eclipse ou cando se executa **adb start-server**. Este servidor sempre escoita nun porto impar comezando no 5555.
- O comando atópase no cartafol do SDK en **platform-tools/adb**.
- Funciona do mesmo xeito nos tres SOs.
- Máis información en: <http://developer.android.com/tools/help/adb.html>

Dispositivos conectados

- Dispositivos conectados

```
ladmin@ubase: -  
ladmin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb  
Android Debug Bridge version 1.0.31  
  
-a                - directs adb to listen on all interfaces for a connection  
-d                - directs command to the only connected USB device  
                  returns an error if more than one USB device is present.  
-e                - directs command to the only running emulator.  
                  returns an error if more than one emulator is running.  
-s <specific device> - directs command to the device or emulator with the given  
                  serial number or qualifier. Overrides ANDROID_SERIAL  
                  environment variable.  
-p <product name or path> - simple product name like 'sooner', or  
                  a relative/absolute path to a product  
                  out directory like 'out/target/product/sooner'.  
                  If -p is not specified, the ANDROID_PRODUCT_OUT  
                  environment variable is used, which must  
                  be an absolute path.  
-H                - Name of adb server host (default: localhost)  
-P                - Port of adb server (default: 5037)  
devices [-l]       - list all connected devices  
                  ('-l' will also list device qualifiers)  
connect <host>[:<port>] - connect to a device via TCP/IP  
                  Port 5555 is used by default if no port number is specified.  
disconnect [<host>[:<port>]] - disconnect from a TCP/IP device.  
                  Port 5555 is used by default if no port number is specified.  
                  Using this command with no additional arguments  
                  will disconnect from all connected TCP/IP devices.  
  
device commands:  
adb push <local> <remote> - copy file/dir to device  
adb pull <remote> [<local>] - copy file/dir from device  
adb sync [ <directory> ] - copy host->device only if changed  
                  (-l means list but don't copy)  
                  (see 'adb help all')  
adb shell [ ]           - run remote shell interactively  
adb shell <command>     - run remote shell command  
adb emu <command>       - run emulator console command  
adb logcat [ <filter-spec> ] - View device log  
adb forward --list       - list all forward socket connections.
```

A execución do comando `<ruta sdk>/platform-tools/adb` amosa a axuda do mesmo.

```
ladmin@ubase: ~
ladmin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb devices
List of devices attached
emulator-5554    device

ladmin@ubase:~$
ladmin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb devices -l
List of devices attached
emulator-5554    device product:sdk_x86 model:Android_SDK_built_for_x86 device:generic_x86

ladmin@ubase:~$
```

`<ruta sdk>/platform-tools/adb devices` amosa os dispositivos reais e virtuais conectados ao ordenador. Co parámetro `-l` amosa o tipo de dispositivo.

O shell do dispositivo

- Permite executar comandos dentro do dispositivo android.
- Android está baseado en Linux, por tanto poderanse executar moitos dos comandos dese SO nun dispositivo android.
- **Importante:** Para acceder en modo root en AVDs con versións de android 7 ou superior débese executar antes de entrar nel: **adb root**.

- `adb shell`

```
ladmin@ubase: ~
ladmin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb shell
root@generic_x86:/ #
```

`<ruta sdk>/platform-tools/adb shell` permite conectarse á consola do dispositivo. Olla que neste exemplo hai un só dispositivo conectado, logo veremos como se actúa cando hai dous ou máis.

```
ladmin@ubase: ~
ladmin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb shell
root@generic_x86:/ #
root@generic_x86:/ # pwd
/
root@generic_x86:/ #
```

A consola do dispositivo e a execución do comando `pwd`.

```
ladmin@ubase: ~
root@generic_x86:/ # df
Filesystem      Size      Used      Free    Blksize
/dev            249.5M    84.0K    249.4M    4096
/mnt/secure     249.5M     0.0K    249.5M    4096
/mnt/asec       249.5M     0.0K    249.5M    4096
/mnt/obb        249.5M     0.0K    249.5M    4096
/system         287.1M    287.1M     0.0K    4096
/data           194.0M    11.7M    182.3M    4096
/cache          64.0M     1.1M    62.9M    4096
/storage/sdcard 126.0M     8.5K    126.0M    512
/mnt/secure/asec 126.0M     8.5K    126.0M    512
root@generic_x86:/ #
```

A execución do comando `df` para ver os puntos de montaxe, os seus tamaños e consumos de espazo.

```
ladmin@ubase: ~
root@generic_x86:/ # mount
rootfs / rootfs ro,relatime 0 0
tmpfs /dev tmpfs rw,seclabel,nosuid,relatime,nodev=755 0 0
devpts /dev/pts devpts rw,seclabel,relatime,nodev=600 0 0
proc /proc proc rw,relatime 0 0
sysfs /sys sysfs rw,seclabel,relatime 0 0
selinuxfs /sys/fs/selinux selinuxfs rw,relatime 0 0
debugfs /sys/kernel/debug debugfs rw,relatime 0 0
tmpfs /mnt/secure tmpfs rw,seclabel,relatime,nodev=700 0 0
tmpfs /mnt/asec tmpfs rw,seclabel,relatime,nodev=755,gid=1000 0 0
tmpfs /mnt/obb tmpfs rw,seclabel,relatime,nodev=755,gid=1000 0 0
/dev/block/mtdblock0 /system yaffs2 ro,seclabel,relatime 0 0
/dev/block/mtdblock1 /data yaffs2 rw,seclabel,nodev,relatime 0 0
/dev/block/mtdblock2 /cache yaffs2 rw,seclabel,nosuid,nodev,relatime 0 0
/dev/block/vold/179:0 /storage/sdcard vfat rw,direct,nosuid,nodev,noexec,relatime,uid=1000,gid=1015,fnmask=0702,dnmask=0702,allow_utime=0020,codepage=cp437,iocharset=iso8859-1,shortname=mixed,utf8,errors=remount-ro 0 0
tmpfs /storage/sdcard/.android_secure tmpfs ro,seclabel,relatime,size=0k,nodev=600 0 0
root@generic_x86:/ #
```

A execução do comando **mount** que amosa em que directorios estão montado os dispositivos físicos. Observar onde está montada a tarxeta SD, o formato de ficheiros, a codificación de caracteres, etc.

```
admin@ubase: ~  
root@generic_x86:/ # ls -l  
drwxr-xr-x root root 2013-10-26 03:25 acct  
drwxrwx--- system cache 2013-10-25 11:49 cache  
dr-x----- root root 2013-10-26 03:25 config  
lrwxrwxrwx root root 2013-10-26 03:25 d -> /sys/kernel/debug  
drwxrwx--x system system 2013-10-25 13:10 data  
-rw-r--r-- root root 116 1969-12-31 19:00 default.prop  
drwxr-xr-x root root 2013-10-26 03:25 dev  
lrwxrwxrwx root root 2013-10-26 03:25 etc -> /system/etc  
-rw-r--r-- root root 8753 1969-12-31 19:00 file_contexts  
-rw-r----- root root 495 1969-12-31 19:00 fstab.goldfish  
-rwxr-x--- root root 359680 1969-12-31 19:00 init  
-rwxr-x--- root root 2660 1969-12-31 19:00 init.goldfish.rc  
-rwxr-x--- root root 19930 1969-12-31 19:00 init.rc  
-rwxr-x--- root root 1795 1969-12-31 19:00 init.trace.rc  
-rwxr-x--- root root 3915 1969-12-31 19:00 init.usb.rc  
drwxrwxr-x root system 2013-10-26 03:25 mnt  
dr-xr-xr-x root root 2013-10-26 03:25 proc  
-rw-r--r-- root root 2109 1969-12-31 19:00 property_contexts  
drwx----- root root 2013-08-01 05:04 root  
drwxr-x--- root root 1969-12-31 19:00/sbin  
lrwxrwxrwx root root 2013-10-26 03:25 sdcard -> /storage/sdcard  
-rw-r--r-- root root 611 1969-12-31 19:00 seapp_contexts  
-rw-r--r-- root root 63747 1969-12-31 19:00 sepolicy  
d---r-x--- root sdcard_r 2013-10-26 03:25 storage  
dr-xr-xr-x root root 2013-10-26 03:25 sys  
drwxr-xr-x root root 2013-08-01 04:31 system  
-rw-r--r-- root root 272 1969-12-31 19:00 ueventd.goldfish.rc  
-rw-r--r-- root root 4824 1969-12-31 19:00 ueventd.rc  
lrwxrwxrwx root root 2013-10-26 03:25 vendor -> /system/vendor  
root@generic_x86:/ #
```

ls -l amosa o contido en formato lista do directorio actual: o raíz. Na carpeta **data** ...

```
admin@ubase: ~  
root@generic_x86:/ # cd data  
root@generic_x86:/data #  
root@generic_x86:/data # ls  
app  
app-asec  
app-lib  
app-private  
backup  
bugreports  
dalvik-cache  
data  
dontpanic  
drm  
local  
lost+found  
media  
mediadrn  
misc  
nativebenchmark  
nativetest  
property  
resource-cache  
security  
ssh  
system  
user  
root@generic_x86:/data #
```

... está outra carpeta chamada **data** que ...

```
admin@ubase: ~
root@generic_x86:/data # cd data
root@generic_x86:/data/data # ls
com.android.backupconfirm
com.android.browser
com.android.calculator2
com.android.calendar
com.android.camera
com.android.certinstaller
com.android.contacts
com.android.customlocale2
com.android.defcontainer
com.android.deskclock
com.android.development
com.android.development_settings
com.android.dialer
com.android.dreams.basic
com.android.email
com.android.emulator.connectivity.test
com.android.emulator.gps.test
com.android.exchange
com.android.fallback
com.android.gallery
com.android.gesture.builder
com.android.htmlviewer
com.android.inputdevices
com.android.inputmethod.latin
com.android.inputmethod.pinyin
com.android.keychain
com.android.launcher
com.android.location.fused
com.android.nms
com.android.music
com.android.packageinstaller
com.android.phone
com.android.protips
com.android.providers.applications
com.android.providers.calendar
com.android.providers.contacts
com.android.providers.downloads
```

... contén as aplicacións instaladas no dispositivo. Entre elas unha chamada **com.android.providers.contacts**.

Xestión dunha BBDD con sqlite3

- A modo de exemplo vaise ver como facer consultas básicas, dentro do dispositivo, co xestor **sqlite3**.
- Máis información en: <http://www.sqlite.org/>
- Vaise traballar coa bases de datos dos contactos do teléfono.

- **sqlite3**

```
admin@ubase: ~
root@generic_x86:/data/data # cd com.android.providers.contacts
root@generic_x86:/data/data/com.android.providers.contacts #
root@generic_x86:/data/data/com.android.providers.contacts # ls
cache
databases
files
lib
shared_prefs
```

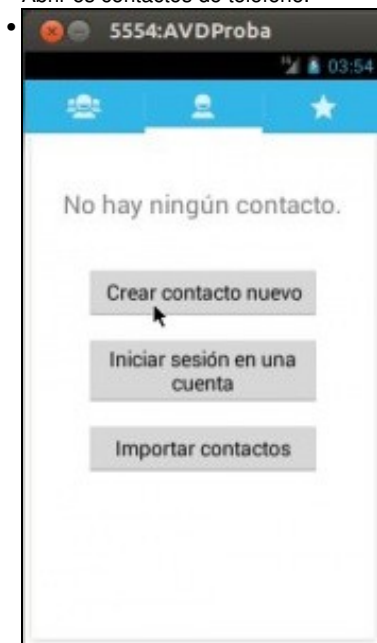
Situarse na carpeta da aplicación. Toda aplicación ten unha estrutura de ficheiros semellante. Hai un directorio chamado **databases**.

```
admin@ubase: ~
root@generic_x86:/data/data/com.android.providers.contacts # cd databases/
root@generic_x86:/data/data/com.android.providers.contacts/databases # ls
contacts2.db
contacts2.db-journal
profile.db
profile.db-journal
```

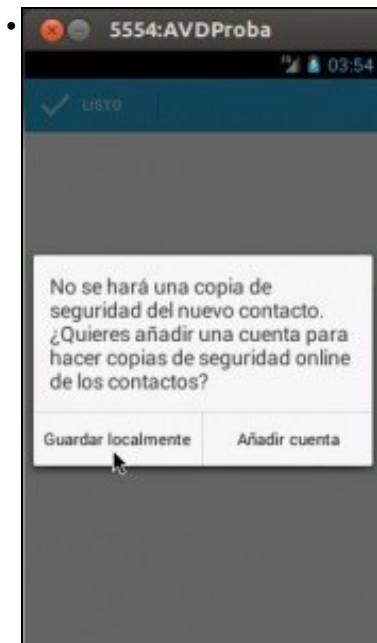
Contén un ficheiro **sqlite3** que é unha base de datos chamada **contacts2.db**.



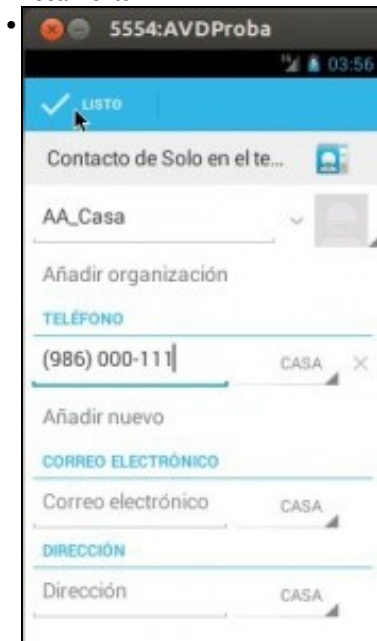
Abrir os contactos do teléfono.



Crear un novo contacto ...



Localmente ...



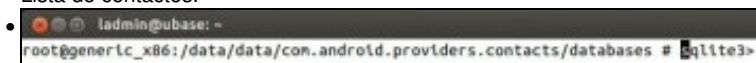
Indicar o nome e o número e gardar o contacto.



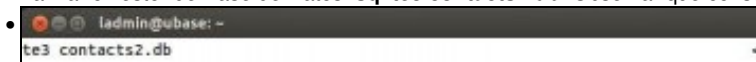
Volver á axenda.



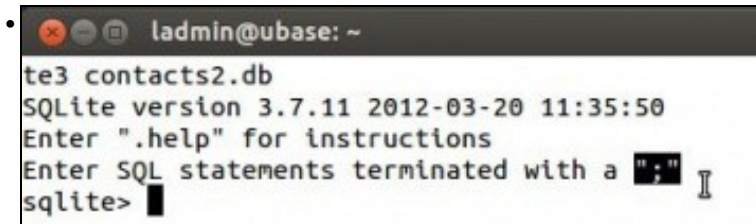
Lista de contactos.



Lanzar o xestor de Base de Datos. **sqlite3 contacts2.db**. Observar que consola se despraza cara ...



... a dereita.



Todo comando empieza por **punto "."**, salvo as sentencias sql, e estas deben rematar en **";"**.

```
admin@ubase:~$ sqlite3
SQLite version 3.7.11 2012-03-28 11:35:58
Enter ".help" for instructions
Enter SQL statements terminated with a ";"
sqlite> .help
.backup DATABASE? FILE      Backup DB (default "main") to FILE
.bell ON|OFF                Stop after hitting an error.  Default OFF
.databases                  List names and files of attached databases
.dump DATABASE? ...         Dump the database in an SQL text format
                             If TABLE specified, only dump tables matching
                             LIKE pattern TABLE.
.echo ON|OFF                Turn command echo on or off
.exit                       Exit this program
.explain ON|OFF             Turn output mode suitable for EXPLAIN on or off.
                             With no args, it turns EXPLAIN on.
.header(s) ON|OFF           Turn display of headers on or off
.help                       Show this message
.import FILE TABLE         Import data from FILE into TABLE
.indices DATABASE?          Show names of all indices
                             If TABLE specified, only show indices for tables
                             matching LIKE pattern TABLE.
.log FILE|off               Turn logging on or off.  FILE can be stderr/stdout
.mode MODE DATABASE?        Set output mode where MODE is one of:
                             csv      Comma-separated values
                             column   Left-aligned columns.  (See .width)
                             html     HTML <table> code
                             insert   SQL insert statements for TABLE
                             line     One value per line
                             list      Values delimited by .separator string
                             tabs     Tab-separated values
                             tcl       TCL list elements
.nullvalue STRING           Print STRING in place of NULL values
.output FILENAME            Send output to FILENAME
.output stdout              Send output to the screen
.prompt MAIN CONTINUE       Replace the standard prompts
.quit                       Exit this program
.read FILENAME              Execute SQL in FILENAME
.restore DATABASE? FILE     Restore content of DB (default "main") from FILE
.schema DATABASE?          Show the CREATE statements
                             If TABLE specified, only show tables matching
```

.help amosa a axuda do xestor.

```
admin@ubase:~$ sqlite3
sqlite> .help
.explain ON|OFF             Turn output mode suitable for EXPLAIN on or off.
                             With no args, it turns EXPLAIN on.
.header(s) ON|OFF           Turn display of headers on or off
.help                       Show this message
.import FILE TABLE         Import data from FILE into TABLE
.indices DATABASE?          Show names of all indices
                             If TABLE specified, only show indices for tables
                             matching LIKE pattern TABLE.
.log FILE|off               Turn logging on or off.  FILE can be stderr/stdout
.mode MODE DATABASE?        Set output mode where MODE is one of:
                             csv      Comma-separated values
                             column   Left-aligned columns.  (See .width)
                             html     HTML <table> code
                             insert   SQL insert statements for TABLE
                             line     One value per line
                             list      Values delimited by .separator string
                             tabs     Tab-separated values
                             tcl       TCL list elements
.nullvalue STRING           Print STRING in place of NULL values
.output FILENAME            Send output to FILENAME
.output stdout              Send output to the screen
.prompt MAIN CONTINUE       Replace the standard prompts
.quit                       Exit this program
.read FILENAME              Execute SQL in FILENAME
.restore DATABASE? FILE     Restore content of DB (default "main") from FILE
.schema DATABASE?          Show the CREATE statements
                             If TABLE specified, only show tables matching
                             LIKE pattern TABLE.
.separator STRING           Change separator used by output mode and .import
.show                       Show the current values for various settings
.stats ON|OFF               Turn stats on or off
.tables DATABASE?           List names of tables
                             If TABLE specified, only list tables matching
                             LIKE pattern TABLE.
.timeout MS                 Try opening locked tables for MS milliseconds
.vfsname ?AUX?             Print the name of the VFS stack
.width NUM1 NUM2 ...        Set column widths for "column" mode
.timer ON|OFF               Turn the CPU timer measurement on or off
sqlite>
```



```
sqlite> .databases
seq name          file
-----
0  main           /data/data/com.android.providers.contacts/databases/contac
sqlite>
```

```
sqlite> .show
      echo: off
      explain: off
      headers: off
      mode: list
nullvalue: ""
      output: stdout
separator: "|"
      stats: off
      width:
sqlite>
```

```
sqlite> .tables
_sync_state          phone_lookup         view_data_usage_stat
_sync_state_metadata photo_files          view_entities
accounts            properties           view_groups
agg_exceptions      raw_contacts         view_raw_contacts
android_metadata    search_index         view_raw_entities
calls               search_index_content view_stream_items
contacts            search_index_docsize view_v1_contact_methods
data                search_index_segdir  view_v1_extensions
data_usage_stat     search_index_segments view_v1_group_membership
default_directory   search_index_stat    view_v1_groups
deleted_contacts    settings             view_v1_organizations
directories           status_updates       view_v1_people
groups              stream_item_photos   view_v1_phones
ninetypes           stream_items         view_v1_photos
name_lookup         v1_settings         visible_contacts
nickname_lookup     view_contacts        voicemail_status
packages            view_data
```

```
sqlite> select * from raw_contacts
...> |
1|1|0|0|2|1|0|1|0|0|0|0|0|AA_Casa|AA_Casa|40||0|AA_Casa|A|1|AA_Casa|A|1|0|0|
sqlite>
```

```
sqlite> select * from view_v1_phones;  
1|1|0|(986) 000-111|1||111000689|AA_Casa|AA_Casa||||0||0|0|0|0|  
sqlite>
```

```

.mode MODE ?TABLE?      Set output mode where MODE is one of:
I      csv              Comma-separated values
      column           Left-aligned columns. (See .width)
      html             HTML <table> code
      insert           SQL insert statements for TABLE
      line            One value per line
      list            Values delimited by .separator string
      tabs           Tab-separated values
      tcl            TCL list elements

```

```

• sqlite> .mode line
sqlite> select * from raw_contacts;
      _id = 1
    account_id = 1
    sourceId =
raw_contact_is_read_only = 0
    version = 2
    dirty = 1
    deleted = 0
    contact_id = 1
    aggregation_node = 0
    aggregation_needed = 0
    custom_ringtone =
    send_to_voicemail = 0
    times_contacted = 0
    last_time_contacted =
    starred = 0
    display_name = AA_Casa
    display_name_alt = AA_Casa
    display_name_source = 40
    phonetic_name =
    phonetic_name_style = 0
    sort_key = AA_Casa
    phonebook_label = A
    phonebook_bucket = 1
    sort_key_alt = AA_Casa
    phonebook_label_alt = A
    phonebook_bucket_alt = 1
    name_verified = 0
    sync1 =
    sync2 =
    sync3 =
    sync4 =
sqlite>

```

.mode line indica que amose cada campo dunha táboa co seu valor nunha liña por campo. **select * from raw_contacts;**

```

• sqlite> .exit
1)root@generic_x86:/data/data/com.android.providers.contacts/databases #

```

.exit serve para saír do xestor e volver á consola do dispositivo.

```

• admin@ubase: ~
root@generic_x86:/data/data/com.android.providers.contacts/databases # exit
admin@ubase:~$ ls
Descargas  Escritorio  Imaxes  Música  Ubuntu One  workspace
Documentos  examples.desktop  Modelos  Público  Videos
admin@ubase:~$

```

Con **exit** saímos da consola do dispositivo e volvemos á consola do ordenador.

```

• admin@ubase: ~
admin@ubase:~$ ls
Descargas  Escritorio  Imaxes  Música  Ubuntu One  workspace
Documentos  examples.desktop  Modelos  Público  Videos
admin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb shell ls
acct
cache
config
d
data
default.prop
dev
etc
file_contexts
fstab.goldfish
init
init.goldfish.rc
init.rc
init.trace.rc
init.usb.rc
mnt
proc
property_contexts
root
sbin
sdcard
seapp_contexts
sepolicy
storage
sys
system
ueventd.goldfish.rc
ueventd.rc
vendor
admin@ubase:~$

```

Con **adb shell comando** execútase o comando na consola do dispositivo e a saída amósase na consola do ordenador.

Nota: Se queremos reiniciar o dispositivo teremos que executar, dentro do shell, as seguintes ordes:

- ◊ stop
- ◊ start

Con isto faremos o 'efecto' de reiniciar. Isto é necesario no caso de ter un servizo que se executa cando se acende o dispositivo Android e queiramos comprobar o seu funcionamento.

Sacar ficheiros do dispositivo

- Outra das funcionalidades que nos permite é sacar ficheiros/carpetas do dispositivo.

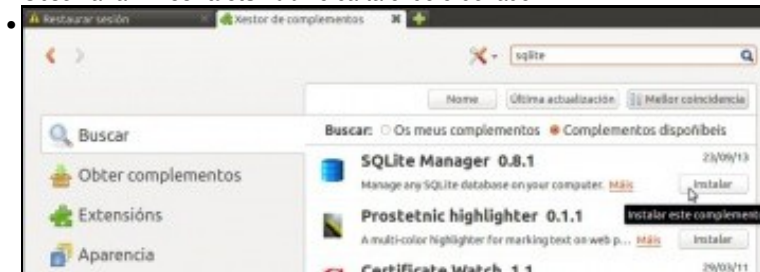
- adb pull

```
ladnín@ubase: ~$ /opt/android-sdk-linux/platform-tools/adb pull /data/data/com.android.providers.contacts/databases/contacts2.db
```

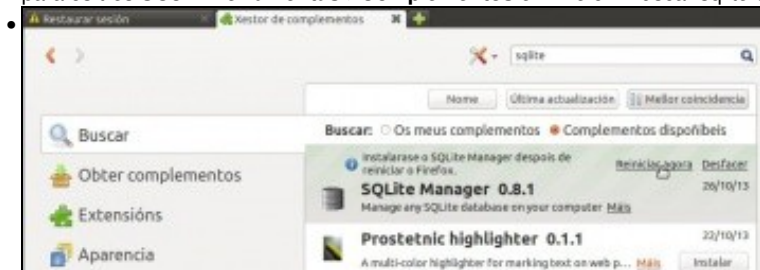
Neste caso sácase do dispositivo a BD anterior de contactos: **contacts2.db**. Co parámetro: **adb pull**. (<ruta sdk>/platform-tools/adb pull /data/data/com.android.providers.contacts/databases/contacts2.db)

```
ladnín@ubase: ~$ /opt/android-sdk-linux/platform-tools/adb pull /data/data/com.android.providers.contacts/databases/contacts2.db
1263 KB/s (307200 bytes in 0.237s)
ladnín@ubase: ~$ ls
contacts2.db  Escritorio  Modelos  Ubuntu One
Descargas    examples.desktop  Música  Videos
Documentos   Imaxes          Público  workspace
ladnín@ubase: ~$
```

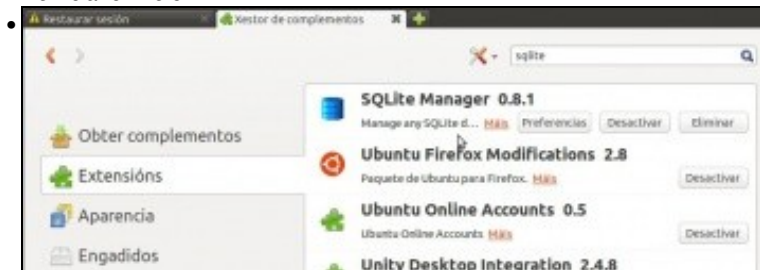
Observar a BD **contacts2.db** no cartafol do ordenador.



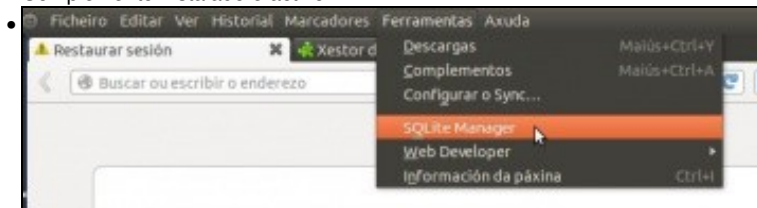
Existen moitos xestores para manipular BBDD sqlite3, neste caso vaise instalar no ordenador un complemento no Mozilla Firefox e así vale para os tres SOs. Ir **Ferramentas->Complementos** en Firefox. Buscar **sqlite** e instalar o complemento **Sqlite Manager**



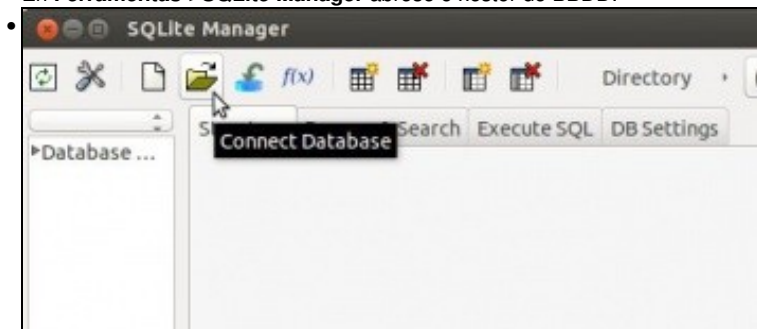
Reiniciar o Firefox.



Complemento instalado e activo.



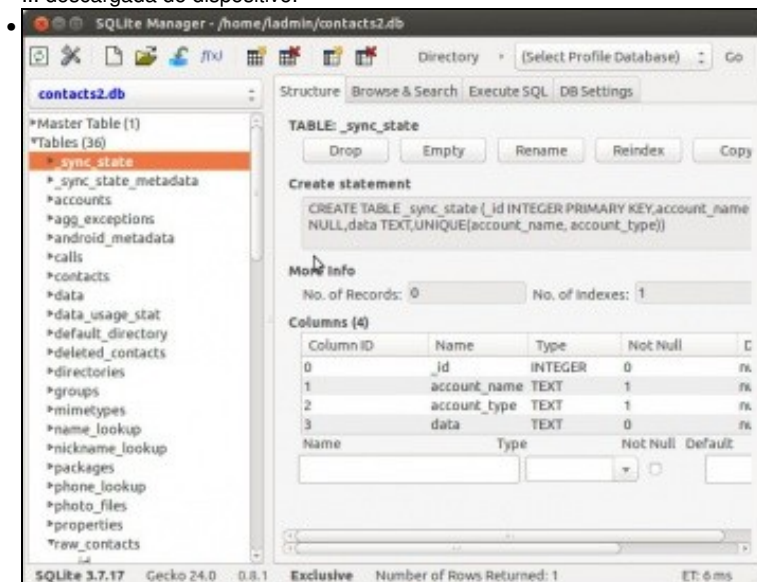
En Ferramentas->SQLite Manager ábrese o xestor de BBDD.



Conectar á BD ...



... descargada do dispositivo.

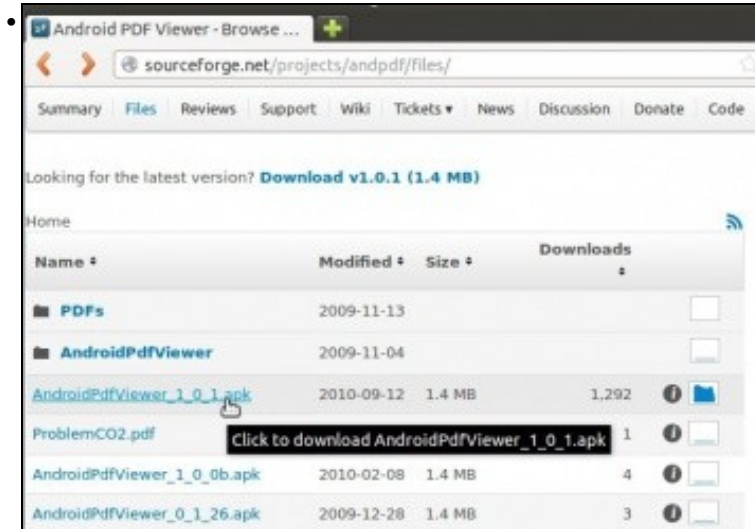


Agora pódese manipular a BD.

Instalar unha aplicación

- As aplicacións instalables teñen extensión **apk** como se verá na UNIDADE 2 do curso: **adb install**.
- Neste caso vaise baixar de internet un visor PDF moi sinxelo para Android.

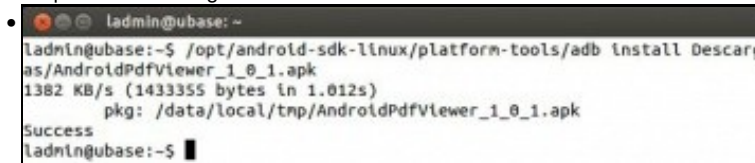
- adb install



Descargar o .apk do visor PDF de <http://sourceforge.net/projects/andpdf/files/>



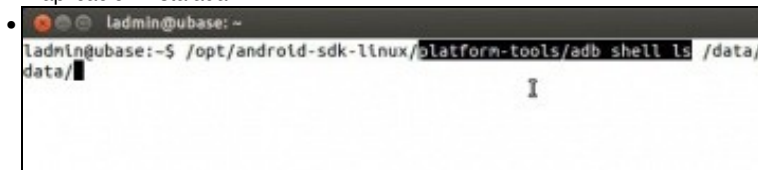
A aplicación descargada.



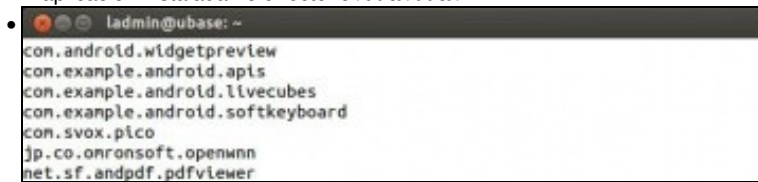
<ruta sdk>/platform-tools/adb install Descargas/AndroidPdfViewer_1_0_1.apk instalará o paquete no dispositivo.



A aplicación instalada.



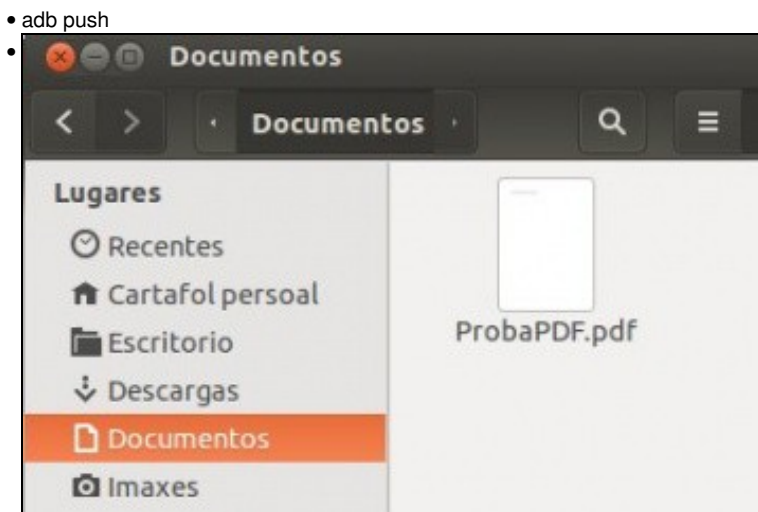
A aplicación instalada no directorio **/data/data/** ...



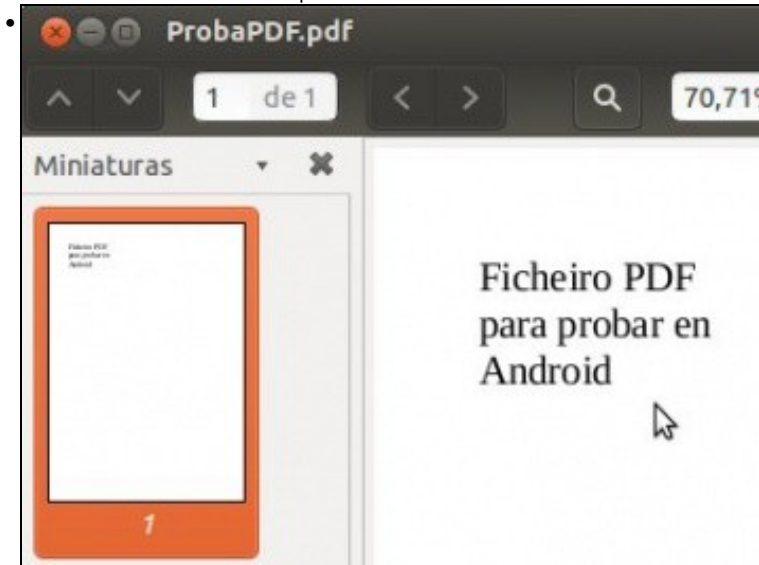
... do dispositivo.

Introducir ficheiro no dispositivo

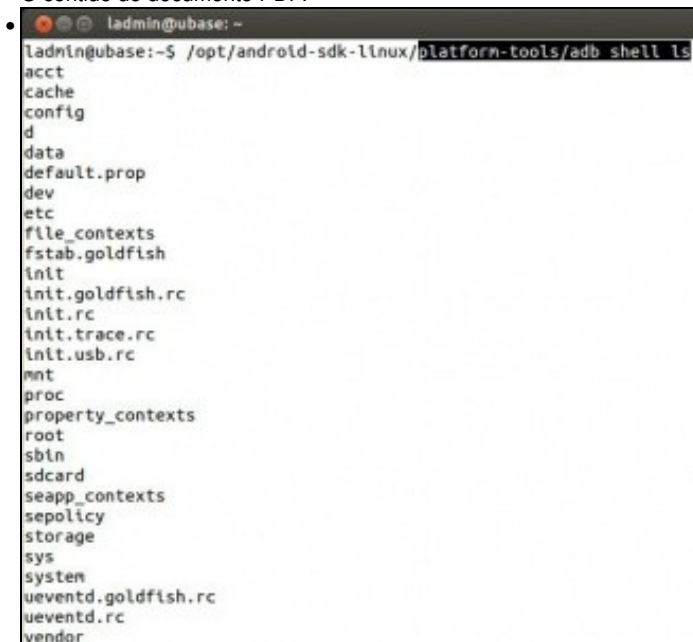
- Ao igual que se sacan ficheiros do dispositivo tamén se poden introducir ficheiros no mesmo: **adb push**.



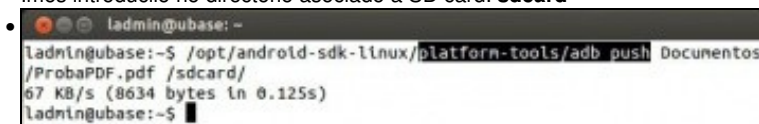
Crear un documento PDF de proba ou escoller un xa feito.



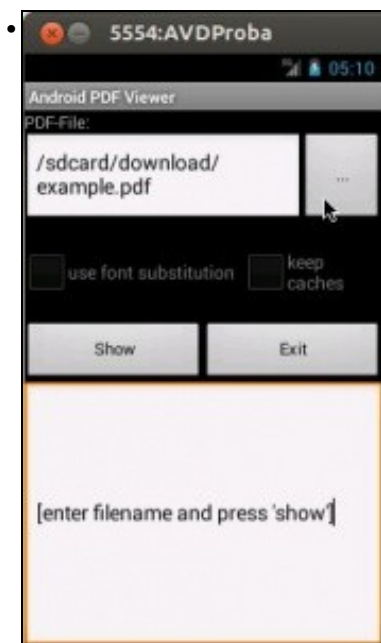
O contido do documento PDF.



Imos introducilo no directorio asociado á SD card: **sdcard**



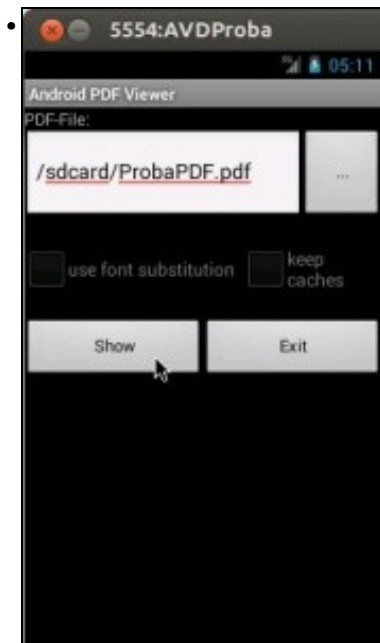
<ruta sdk>/platform-tools/adb push Documentos/ProbaPDF.pdf /sdcard/



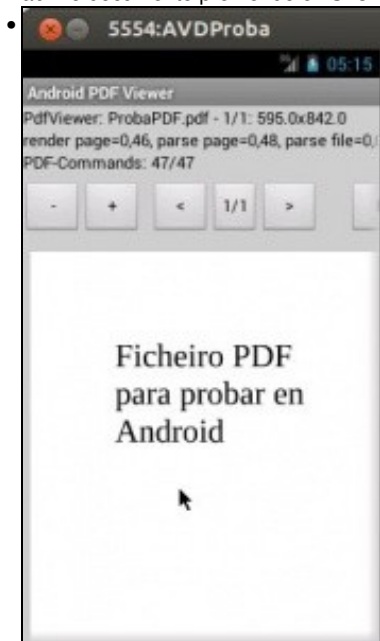
Abrir o visor de PDFs no dispositivo e navegar ...



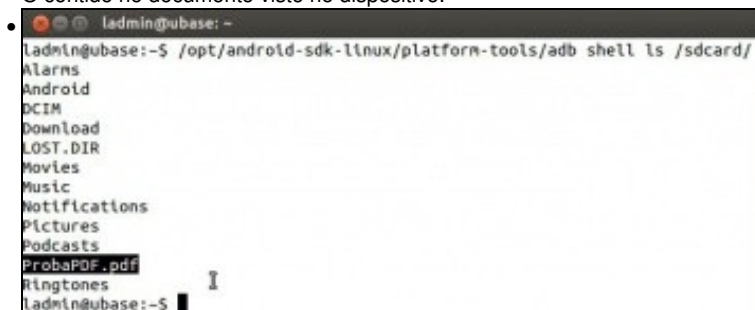
até /sdcard e



abrir o documento premendo en **show**.



O contido no documento visto no dispositivo.

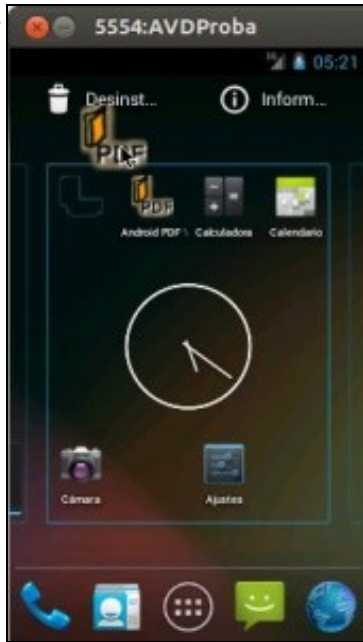


adb shell ls /sdcard amosa que o documento está na tarxeta SD.

Desinstalar unha aplicación do dispositivo

- Ao igual que se pode instalar unha aplicación tamén se pode desinstalar: **adb uninstall**.
- Tamén se pode realizar de modo gráfico.

- adb uninstall



En modo gráfico desinstálase unha aplicación mantendo pulsada e arrastrándoa ao lixo. Vaise realizar con adb.

```
ladmin@ubase: ~
con.android.widgetpreview
con.example.android.apis
con.example.android.livecubes
con.example.android.softkeyboard
con.svox.pico
jp.co.onronsoft.openwnn
net.sf.andpdf.pdfviewer
```

En /data/data podemos ver o nome da aplicación.

```
ladmin@ubase: ~$ /opt/android-sdk-linux/platform-tools/adb uninstall net.sf.a
ndpdf.pdfviewer
Success
```

<ruta sdk>/platform-tools/adb uninstall net.sf.andpdf.pdfviewer

Varios dispositivos

- Até agora só traballamos con adb cun só dispositivo. Como actuar cando hai máis dun dispositivo real ou virtual?.

- Varios dispositivos



Crear un segundo AVD: **AVDProba2**.



Iniciar os 2 AVDs.

```
ladmin@ubase: ~  
ladmin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb kill-server  
ladmin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb devices  
* daemon not running. starting it now on port 5037 *  
* daemon started successfully *  
List of devices attached  
emulator-5554 device  
emulator-5556 device
```

Parar o servidor adb: <ruta sdk>/platform-tools/adb kill-server

```
ladmin@ubase: ~  
ladmin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb devices  
List of devices attached  
emulator-5554 device  
emulator-5556 device  
  
ladmin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb -s emulator-5556 shell ls  
acct  
cache  
config
```

Buscar os dispositivos conectados: **adb devices**. Observar como se inicia o servidor adb.

```
ladmin@ubase: ~  
ladmin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb devices  
List of devices attached  
emulator-5554 device  
emulator-5556 device  
  
ladmin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb -s emulator-5556 shell ls  
acct  
cache  
config
```

Agora, cando hai máis dun dispositivo, para conectarse a un concreto hai que especificalo, sexa este real ou virtual: usando o parámetro **-s nome do dispositivo**. Neste caso **adb -s emulator-5556 shell ls** amosa o contido da raíz do segundo AVD.

Conectar un dispositivo físico

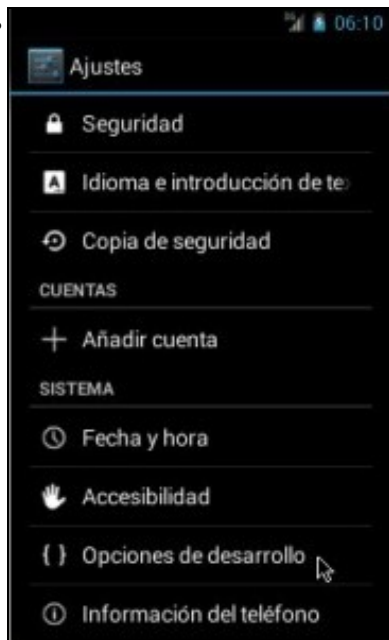
- Agora tócalo a quenda aos dispositivos físicos.
- Hai que habilitar a **Depuración USB**
- Dispositivo físico



Se non aparece en **Ajustes->{ } Opciones de desarrollo**. Ir a **Ajustes -> Información del teléfono**.



Pulsar 7 veces sobre **Número de compilación** e xa aparece ...



... { } **Opciones de desarrollo**. Premer nesa opción. En versións máis antigas ir a **Ajustes-> Aplicaciones->Desarrollo**



Habilitar **Depuración USB**



Aceptar as advertencias.

```
admin@ubase: ~
admin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb devices -l
List of devices attached
emulator-5554      device product:sdk_x86 model:Android_SDK_built_for_x86
emulator-5556      device product:sdk_x86 model:Android_SDK_built_for_x86
20e62b4d           device usb:1-2
```

<ruta sdk>/platform-tools/adb devices -l amosa o nome dos dispositivos e onde está conectado.

```
admin@ubase: ~
admin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb devices
List of devices attached
emulator-5554      device
emulator-5556      device
20e62b4d           device

admin@ubase:~$ /opt/android-sdk-linux/platform-tools/adb -s 20e62b4d shell ls
efs
config
cache
```

<ruta sdk>/platform-tools/adb -s nome-dispositivo é para interactuar con ese dispositivo, neste caso físico.

Conectar un dispositivo físico en Windows

- En Linux e OS X non é preciso instalar o driver do dispositivo para conectarse a el, pero en Windows si.
- Neste caso vaise usar de exemplo un dispositivo físico Samsung.

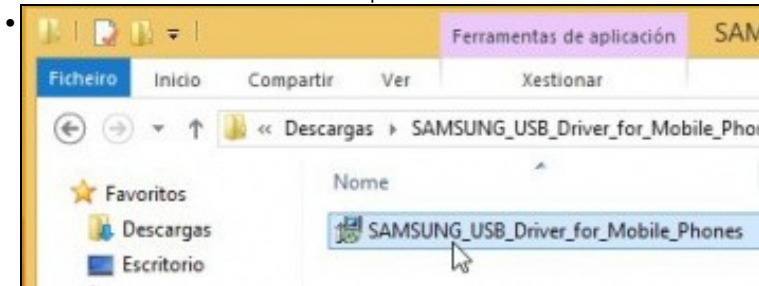
- Dispositivo físico en Windows

```
C:\Windows\system32\cmd.exe
c:\Program Files (x86)\Android\android-sdk\platform-tools>adb devices
* daemon not running. starting it now on port 5037 *
* daemon started successfully *
List of devices attached
c:\Program Files (x86)\Android\android-sdk\platform-tools>
```

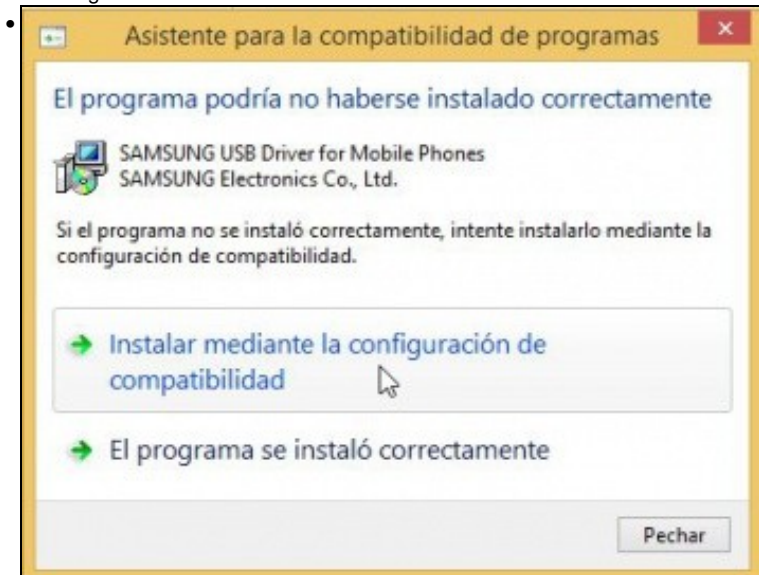
Conectamos o dispositivo físico ao ordenador Windows e <ruta sdk>/platform-tools/adb devices non amosa nada.



Neste caso buscamos o driver do dispositivo.



Descargalo e instalalo.



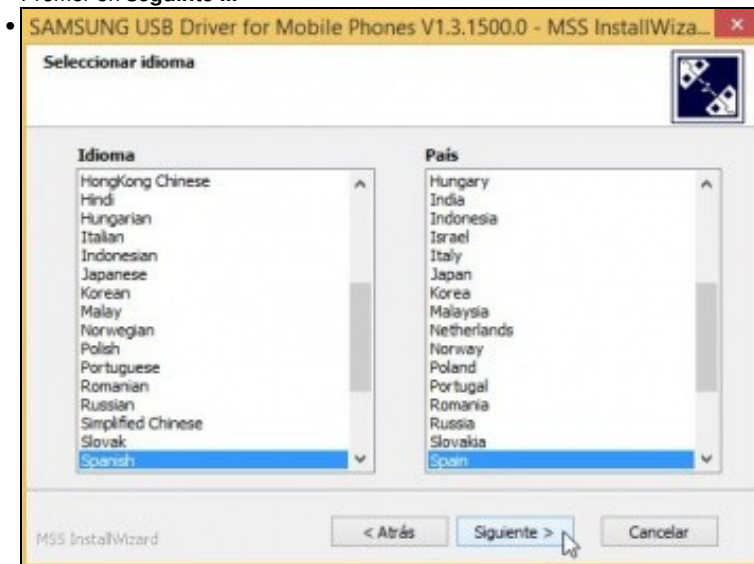
Aceptar as advertencias que amose.



Seguir aceptando ...



Premer en **siguiente** ...



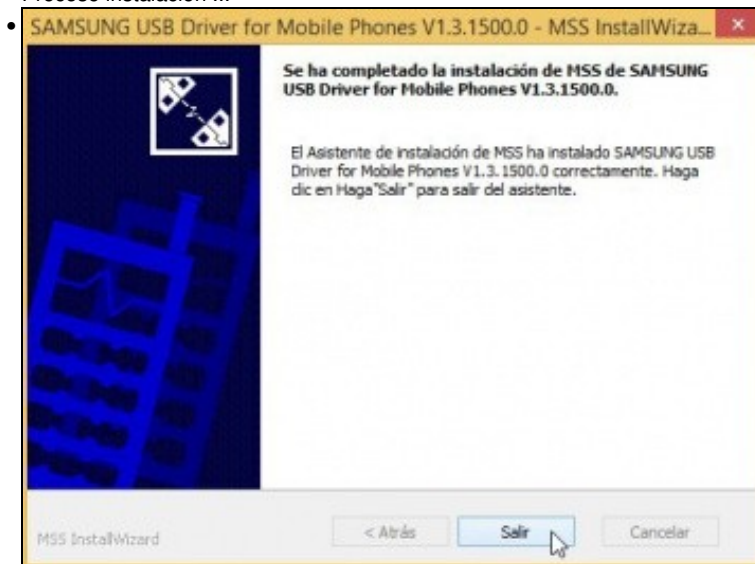
Seleccionar o que indique ...



Instalar ...



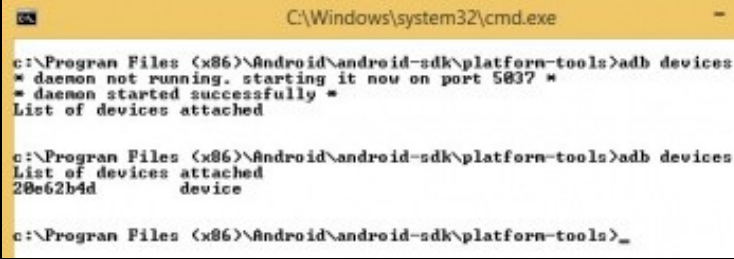
Proceso instalación ...



Rematar instalación.



Aceptar por última vez.

- A screenshot of a Windows command prompt window titled "C:\Windows\system32\cmd.exe". The prompt is at "c:\Program Files (x86)\Android\android-sdk\platform-tools>". The user enters "adb devices". The output is: "* daemon not running. starting it now on port 5037 *", "* daemon started successfully *", and "List of devices attached". The user enters "adb devices" again. The output is: "List of devices attached", "20e62b4d", and "device". The prompt is now "c:\Program Files (x86)\Android\android-sdk\platform-tools>".

<ruta sdk>/platform-tools/adb devices amosa o dispositivo físico conectado ao ordenador.

-- Ángel D. Fernández González e Carlos Carrión Álvarez -- (2020).