What should we do with our user interface?

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Samba's command line UI

- kind of haphazard
- patchy abstractions
- untested *as a user interface*

Nobody can fix it

- experts are locked-in
- newbies are baffled
- old options can't be dropped

"nerdview" — Geoff Pullum

- insiders' wordview prevents communication
- leaks detail you don't need to know in language you don't need to know

nerdview

Your password*

| • • • • • • • • | Display |

Field Password does not match pattern
'^(?=.*[A-Z])(?=.*[a-z])(?=.*[0-9])[A-Za-
z0-9_#@%*\-]+$'.

nerdview

nerdview
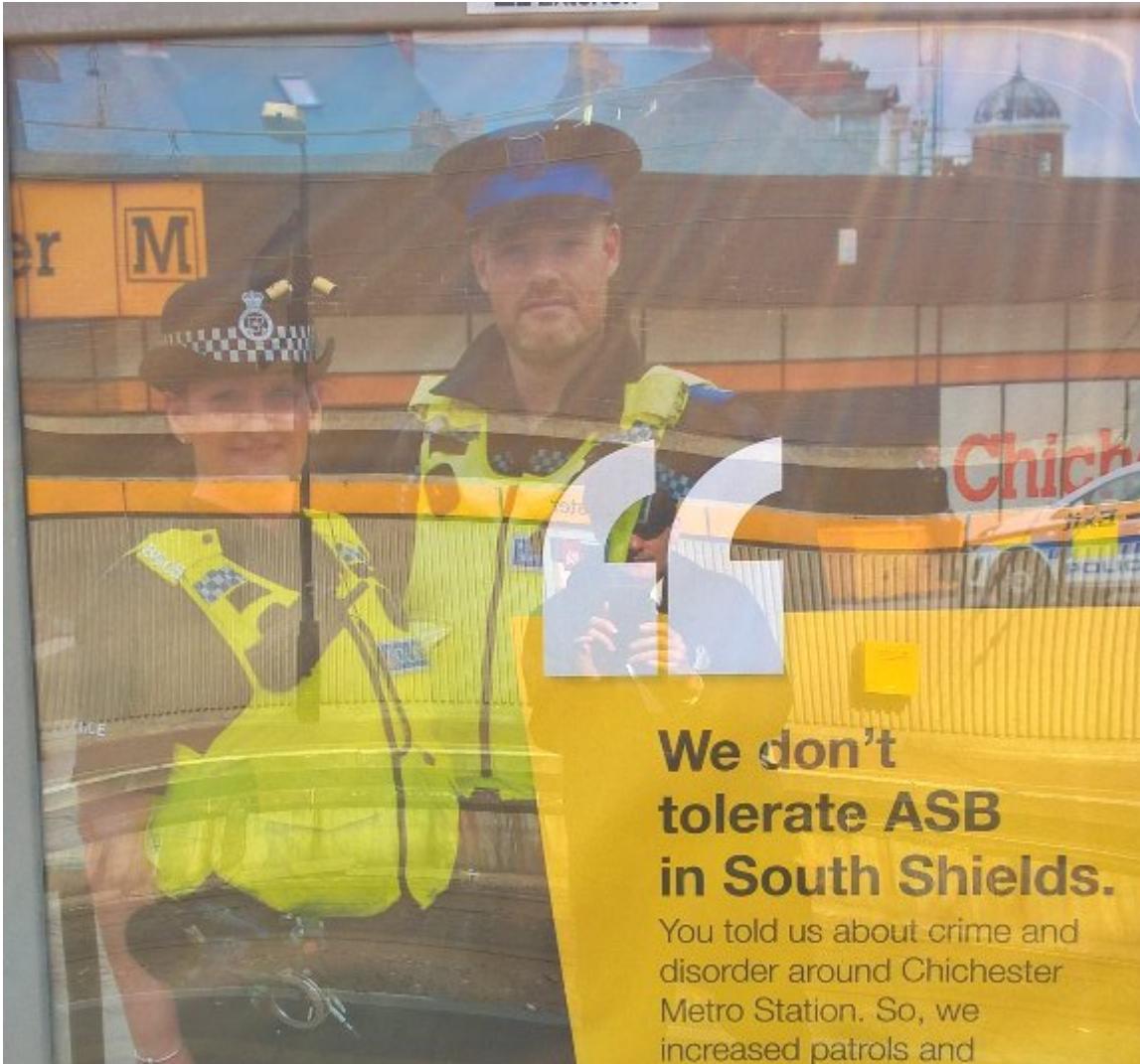
We don't tolerate ASB in South Shields.

You told us about crime and disorder around Chichester Metro Station. So, we increased patrols and

nerdview
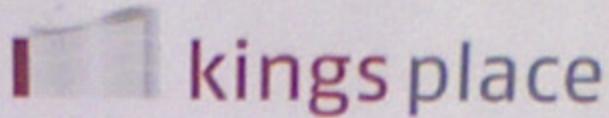
kings place

Please note glazed panel in the absence of manifestations.

Kings Place Building Management Team
020 7841 4860

nerdview

Query Complete

Please remove PRESTO card

nerdview

TRENCHARD STREET CAR PARK

TARIFF

DAYTIME 08:00-18:00

UP TO 1 HOUR -£1.50
UP TO 2 HOURS-£2.50
UP TO 3 HOURS-£3.50
UP TO 4 HOURS-£5.50
OVER 4 HOURS - £12.00

EVENINGS
18:00 - 23:59 -£3.00 ANY PERIOD

OVERNIGHT
18:00 - 09:00 -£4.50 ANY PERIOD
(ARRIVAL BEFORE 23:59)

LOST TICKETS -£25.00

OUT OF ORDER OTHER POFS LEVEL 1 AND 5

DO NOT USE
1p, 2p OR 5p COINS
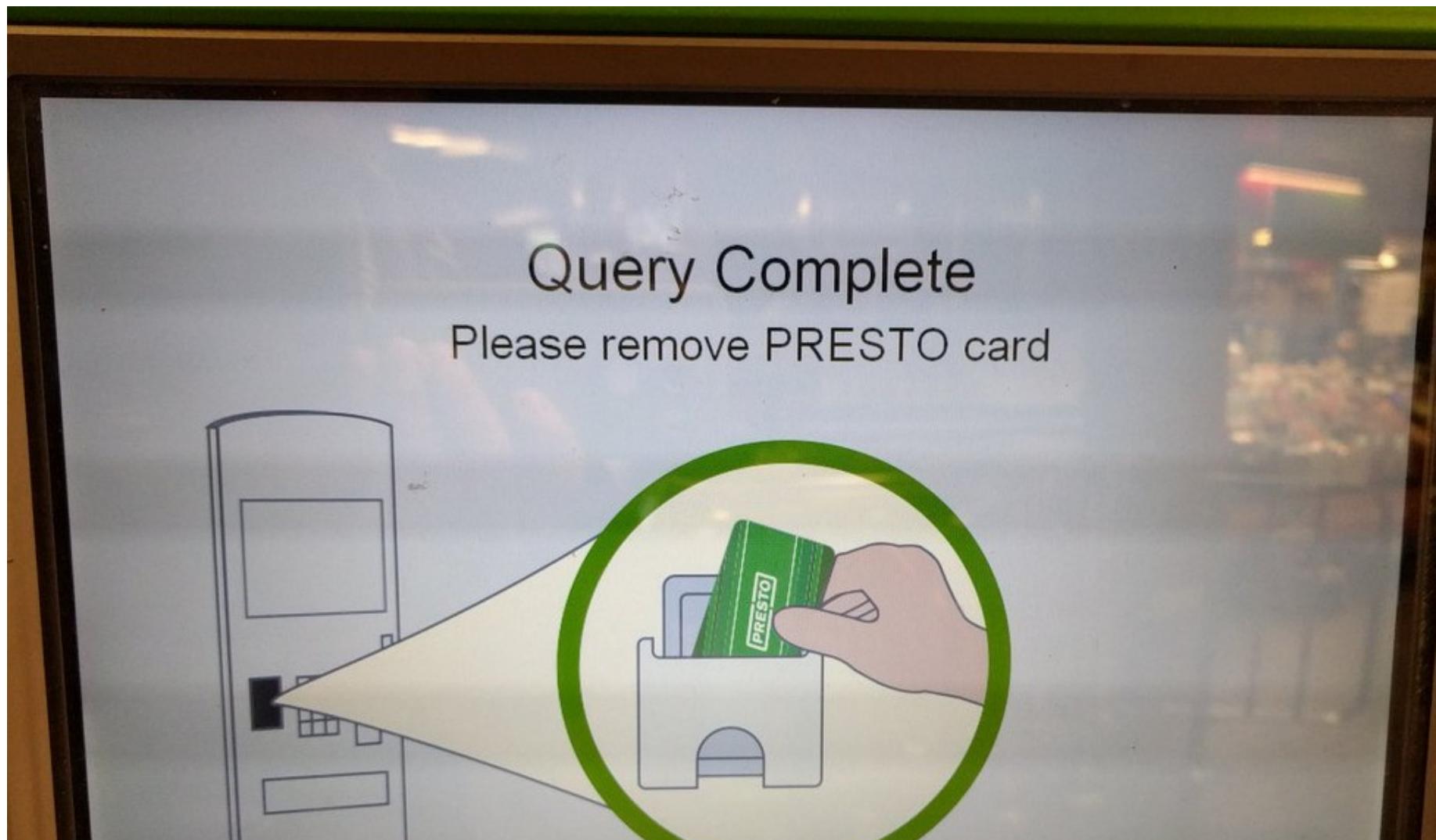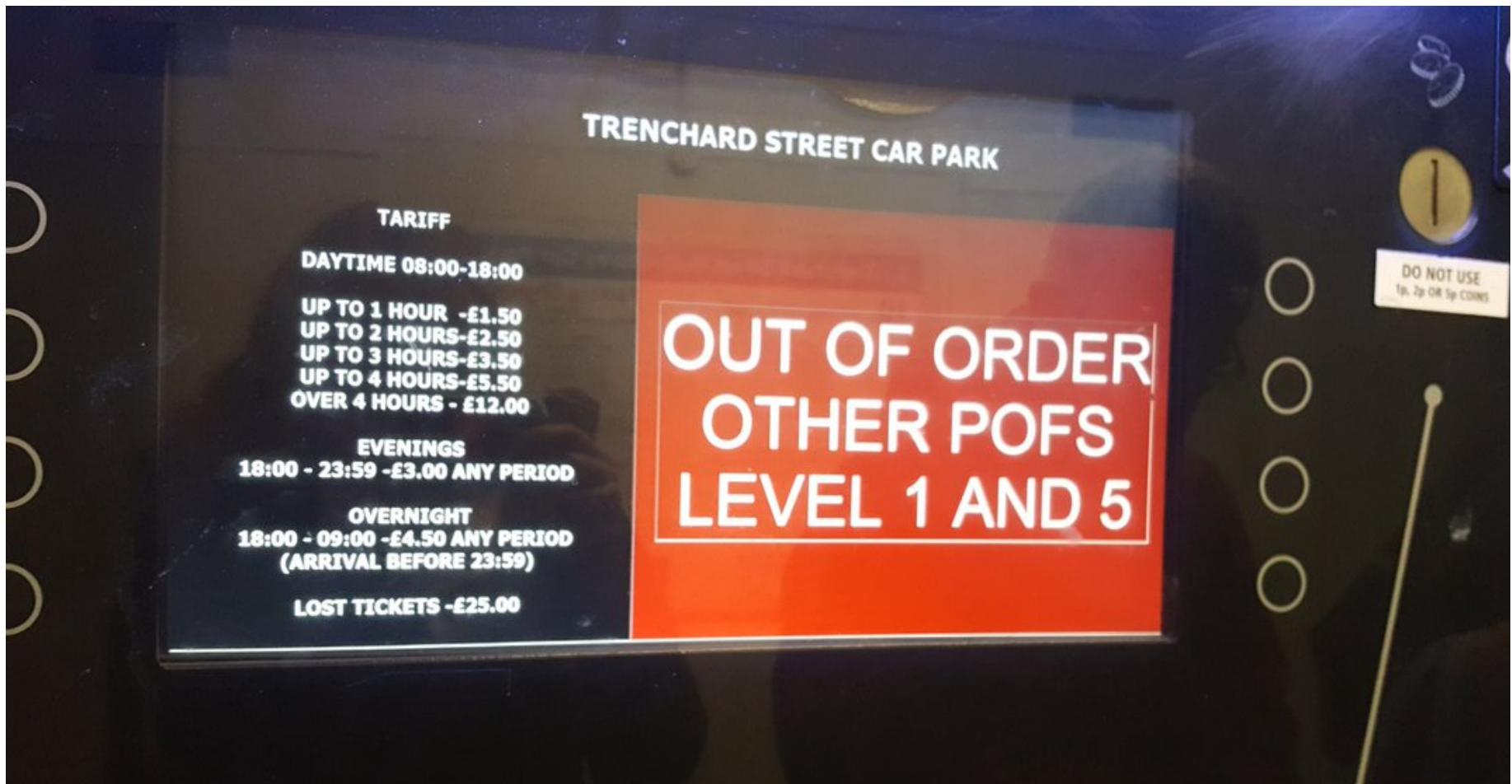
nerdview

Zip/Postal Code

USERNAME

Username

Please Wait
States/Provinces are still
populating for the first time.

Must contain at least 8 characters

nerdview
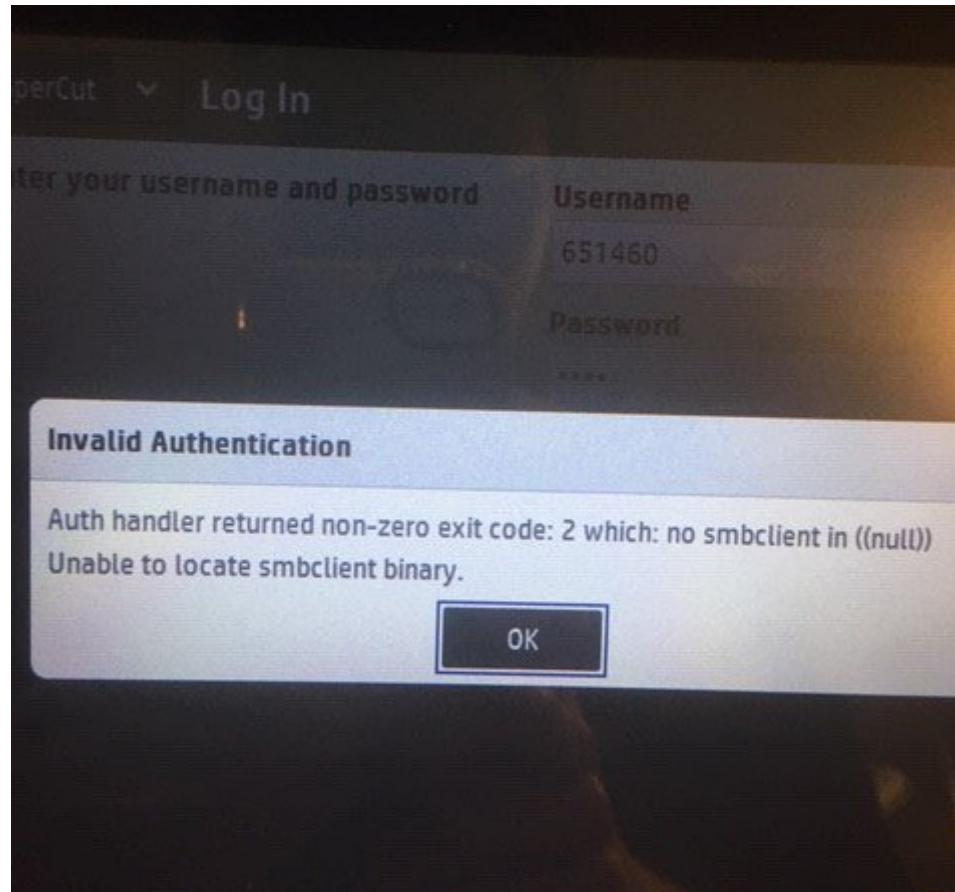
nerdview

```
$ ./bin/samba-tool drs kcc
Could not find machine account in secrets database: Failed to fetch machine acc
ERROR(): DRS connection to client.addom.samba.example.com failed - drsException
  File "bin/python/samba/netcmd/drs.py", line 54, in drsuapi_connect
    (ctx.drsuapi, ctx.drsuapi_handle, ctx.bind_supported_extensions) = drs_util
  File "bin/python/samba/drs_utils.py", line 63, in drsuapi_connect
    raise drsException("DRS connection to %s failed: %s" % (server, e))
```

Samba nerdview

hard to spot

- admin users are themselves specialists
- small intersection between users and developers
- overlap in users' and developers' jargon

Samba nerdview

We need bug reports

but Bugzilla presents deep nerdview

Prior art in the field of command line option rants

A very short literature review

Steve French, two weeks ago:

> *the username and/or password seems to be ignored in different (and possibly confusing to users) ways on various client tools (smbcacls and smbclient for example) when you specify -k (for Kerberos authentication)*

... goes on to enumerate inconsistencies

Rowland:

> *" You forgot 'samba-tool' and the ldb tools (ldbsearch etc) where it is '-k yes' "*

Andreas:

" *I will rewrite the code to offer a new option.*

--use-kerberos=auto|yes|no

[...] -k will mostly be working as before to not break any scripts. "

Backwards compatibility dilemma

fixing consistency across tools
worsens the complexity of each tool

Alexander, last year

" *Everything should have --json* "

... for the machines (he is right)

Testing the command line

Easy to test for

- friendly default output
- self-documentation (--help)

Testing the command line

Hard to test for

- nerdview
- inconsistencies between
  tools
- unknowable functionality

Testing the command line

run every script without arguments and see what happens

expecting something like

```
Usage: smbwhatever [options]
```

Testing the command line

run every ~~script~~ *end-user tool* and see what happens

```
$ ./script/autobuild.py
Traceback (most recent call last):
*[...]*
Exception: Unable to create /memdisk/douglas/b5766 : [Errno 13] Permission deni
```

Testing the command line

run every end-user tool and *some* dev tools

Example fix

```diff
--- a/source4/scripting/bin/samba_upgradeprovision
+++ b/source4/scripting/bin/samba_upgradeprovision
@@ -1589,7 +1589,14 @@ if __name__ == '__main__':
     # This variable will hold the last provision USN once if it
     minUSN = 0
     # 2)
-    ldbs = get_ldbs(paths, creds, session, lp)
+    try:
+        ldbs = get_ldbs(paths, creds, session, lp)
+    except ldb.LdbError as e:
+        if opts.debugall:
+            print(e)
+        parser.print_usage()
+        sys.exit(1)
+
```

testing --help

expecting something like

```
Usage: smbwhatever [options]
 -k,  --kerberos        use kerberos
 -v,  --verbose         print more
```

and success as error code.

testing --help

Not expecting:

- to create a file called `./--help/etc/smb.conf.`
- testenv access to `/usr/local/samba/*`
- a string containing "Traceback"

Usage and --help tests

- many tools already pass
- several easy fixes
- several knownfails
- a small blacklist

--help consistency

ldb tools repeat options, only one works

```
ldbsearch --help | grep -we -s
  -s, --scope=SCOPE                       search scope
  -s, --configfile=CONFIGFILE             Use alternative con
```

--help consistency

```
ldbsearch --help | grep -e '-[siS],'
  -s, --scope=SCOPE                    search scope
  -i, --interactive                    input from stdin
  -S, --sorted                         sort attributes
  -s, --configfile=CONFIGFILE          Use alternative configuration
  -S, --sign                           Sign connection to prevent
  -S, --signing=on|off|required        Set the client signing state
  -i, --scope=SCOPE                    Use this Netbios scope
```

--help consistency

```
ldbsearch --help | grep -e '-[siS],'
  -s, --scope=SCOPE                    search scope
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  -S, --sorted                         sort attributes
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--help consistency

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--help consistency

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ldbsearch --help | grep -e '-[siS],'
  -s, --scope=SCOPE                       search scope
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  -S, --sorted                            sort attributes
  -s, --configfile=CONFIGFILE             Use alternative configuration
  -S, --sign                              Sign connection to prevent
  -S, --signing=on|off|required           Set the client signing state
  -i, --scope=SCOPE                       Use this Netbios scope
```

--help consistency

No automated test now

it is only ldb tools and is almost impossible to fix

Cross-script consistency

- the -k problem

- no automated test

- most options *probably* agree

Cross-script --help consistency

Many *probably* agree

```
--update-list
    3 × --update-list
    3 × --update-list=UPDATE_LIST
-U
    63 × -U USERNAME, --username=USERNAME
    6 × -U, --user=[DOMAIN/]USERNAME[%PASSWORD]      Set the network username
```

Cross-script --help consistency

```
-v
   6 × -v, --verbose            increase verbosity
   6 × -v, --verbose    Verbose output
   4 × -v, --verbose     Verbose output
   1 × -v, --verbose
--host
   2 × --host=HOST       target host name or IP address
   2 × --host=HOST          Ip of the remote host used for comparison
   2 × --host=HOST          Ip of the host
```

Cross-script --help consistency

```
-t
   2 × -t directory      Top level directory of project (default to
   1 × -t TOP, --top=TOP
   1 × -t TIMING_DATA, --timing-data=TIMING_DATA
-r
   6 × -r, --recursive                              recursive delete
   2 × -r, --render    Render templates (default: False)
   1 × -r REPLAY_RATE, --replay-rate=REPLAY_RATE
```

Cross-script --help consistency

```
-e
   6 × -e, --editor=PROGRAM                          external editor
   6 × -e, --encrypt                                 Encrypt connection for privacy
   2 × -e          emergency dump, for corrupt databases
-o
   6 × -o=OPTION                                     ldb_connect option
   2 × -o OUT, --out OUT     write model here
   1 × -o OUT, --out=OUT
```

Cross-script --help consistency

```
-c
   6 × -c, --catch      Catch Ctrl-C and display results so far
   2 × -c, --catch       Catch control-C and display results
   2 × -c          validate contents of the records
   1 × -c, --clean-up       Clean up the generated groups and user accounts
   1 × -c COLORS, --color=COLORS
```

Cross-script --help consistency

```
-C
    6 × -c, --catch      Catch Ctrl-C and display results so far
    2 × -c, --catch       Catch control-C and display results
    1 × -C       enable configure cacheing
```

Cross-script --help consistency

```
-f
   6 × -f, --failfast  Stop on first fail or error
   1 × -f, --force
-b
   6 × -b, --buffer     Buffer stdout and stderr during tests
   6 × -b, --basedn=DN                              base DN
   4 × -b, --buffer      Buffer stdout and stderr during test runs
   2 × -b BASE             set base DN for the search
```

samba-tool consistency

```
-v
    2 × -v, --verbose          Be verbose
    1 × -v, --verbose          Print more details of checking
    1 × -v, --verbose          Print all DN pairs that have been compared
    1 × -v, --verbose          Show default options too
-q
    2 × -q, --quiet            Be quiet
    1 × -q, --quiet            Do not print anything but relay on just exit code
    1 × -q, --quiet            don't print details of checking
```

samba-tool consistency

Surprisingly good

```
--cache
    1 × --cache              List cached zones
    1 × --cache              Search cached records
```

net consistency

Work in progress

```
$ ./bin/net --help
Can't load /usr/local/samba/etc/smb.conf - run testparm to debug it
```

```
$ ./bin/net -s st/client/client.conf --help
Usage:
  Use 'net help rpc' to get more extensive information about 'net rpc' commands.
  Use 'net help rap' to get more extensive information about 'net rap' commands.
  Use 'net help ads' to get more extensive information about 'net ads' commands.
[...]
  Use 'net help help' to list usage information for 'net' commands.
```

```
$ ./bin/net -s st/client/client.conf
Invalid command: net
Usage:
net rpc            Run functions using RPC transport
net rap            Run functions using RAP transport
net ads            Run functions using ADS transport
[...]
net help           Print usage information
```

```
$ ./bin/net -s st/client/client.conf help
Usage:
net rpc              Run functions using RPC transport
net rap              Run functions using RAP transport
net ads              Run functions using ADS transport
[...]
    -e or --encrypt            Encrypt SMB transport (UNIX extended servers only)
    -k or --kerberos       Use kerberos (active directory) authentication
```

```
$ # 'net help --help' is the same
$ ./bin/net -s st/client/client.conf help help
Usage:
net rpc usage:

  Use 'net help rpc' to get more extensive information about 'net rpc' commands.


net rap usage:

  Use 'net help rap' to get more extensive information about 'net rap' commands.
[...]
    -e or --encrypt            Encrypt SMB transport (UNIX extended servers only)
    -k or --kerberos        Use kerberos (active directory) authentication
```

net consistency

```
$ ./bin/net -s st/client/client.conf ads --help

long list of sub-subcommands, no --options
```

net consistency

```
$ ./bin/net -s st/client/client.conf changesecretpw  --help
Machine account password change only supported on a DOMAIN_MEMBER.
Do NOT use this function unless you know what it does!
This function will change the ADS Domain member machine account password in the secre
```

net consistency

less specific --help offers more info:

```
$ ./bin/net  -s st/client/client.conf --help
[...]
  net [options] changesecretpw
    Change the ADS domain member machine account password in secrets.tdb.
    Do NOT use this function unless you know what it does.
    Requires the -f flag to work.
```

net consistency

```
net help --help
man net
actual net options
```

all differ (pending patch aligns the last two)

net consistency

```
net help --help    # 14 long options
man net            # 54 long options
```

net consistency

```
$ ./bin/net -s st/client/client.conf  IDMAP CHECK --help
Usage:
net idmap check  [-v] [-r] [-a] [-T] [-f] [-l] [[--db=]<TDB>]
  Check an idmap database.
    --verbose,-v    verbose
    --repair,-r    repair
    --auto,-a    noninteractive mode
    --test,-T    dry run
    --fore,-f    force
    --lock,-l    lock db while doing the check
    TDB    idmap database
```

net consistency

```
$ ./bin/net -s st/client/client.conf help notify
Usage:
net notify listen
net notify trigger
```

net consistency

```
$ ./bin/net -s st/client/client.conf notify
Invalid command: net notify
Usage:
net notify listen          Register for a path and listen for changes
net notify trigger         Simulate a trigger action
```

net consistency

```
$ ./bin/net -s st/client/client.conf help | grep notify
net notify          notifyd client code
```

notify not in man page

net consistency

```
$ ./bin/net -s st/client/client.conf help usersidlist
Could not get the user/sid list
$ ./bin/net -s st/client/client.conf usersidlist --help
Could not get the user/sid list
$ ./bin/net -s st/client/client.conf usersidlist
Could not get the user/sid list
```

net consistency

```
$ ./bin/net -s st/client/client.conf usersidlist AFEWFEFDSFAEFESF
net usersidlist
    prints out a list of all users the running winbind knows
    about, together with all their SIDs. This is used as
    input to the 'net rpc share allowedusers' command.

Valid targets: choose one (none defaults to localhost)
    -S or --server=        server name
    -I or --ipaddress=    address of target server
    -w or --workgroup=        target workgroup or domain

Valid miscellaneous options are:
    -p or --port=        connection port on target
    -W or --myworkgroup=    client workgroup
    -d or --debuglevel=    debug level (0-10)
    -n or --myname=        client name
    -U or --user=        user name
    -s or --configfile=    pathname of smb.conf file
    -l or --long            Display full information
    -V or --version          Print samba version information
    -P or --machine-pass      Authenticate as machine account
    -e or --encrypt          Encrypt SMB transport (UNIX extended servers only)
    -k or --kerberos        Use kerberos (active directory) authentication
```

Command-line style guide?

... we would ignore it?

bash completion

```
samba_spnupdate -k<tab><tab>
yes no auto
```

bash completion

- existing completions for smbclient, smbget
- option parsing logic *should* know everything necessary

it should be able to introspect and generate completion code

GCC 9 adds `--completion` completion helper

tab completion

```
$ samba-tool --generate-bash-completions >\
        ~/.local/etc/bash_completion.d/samba-tool

$ samba-tool <tab><tab>
computer     dbcheck     delegation     dns     domain
drs          dsacl       forest         fsmo    gpo
group        ldapcmp     ntacl          ou      processes
rodc         schema      sites          spn     testparm
time         user        visualize
```

Do we want this?

- usage/--help tests
- tab completion
- style guide
- --json
- nerdview

reduction

Questions?

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