

> ddlfs

expose your PL/SQL code as local filesystem.

Speaker:

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- I am Oracle DBA and developer at **Abakus Plus d.o.o.**

- Backup Server & Deja Vu
- APPM
- Amon
- Arbiter

- Selected references

- Banka Slovenije
- Aerodrom Ljubljana d.d.
- Delo Prodaja d.d.
- Generali Zavarovalnica d.d.
- Gorenjska Banka d.d.
- Goodyear Dunlop Sava Tires d.o.o.
- Iskra d.d.
- Mestna občina Koper
- Mestna občina Ljubljana
- Zavarovalnica Triglav
- Hranilnica Lon d.d.
- ...

ddlfs

- Open source
- Linux filesystem
- Represents Oracle Database objects as their DDL stored in .SQL files.



<https://github.com/usrecnik/ddlfs>

Why?

- *»Every good work of software starts by scratching a developer's personal itch.«*
- So we can use any Linux software, which can work with plaintext files directly on the database objects.
- `cp`, `rm`, `vim`, ...
- `find`, `grep`, `sed`, `awk`, ...
- `git`, `hg`

Existing Tools?

- *»Good programmers know what to write. Great ones know what to rewrite (and reuse).«*
- GUI
 - SQL Developer
 - PL/SQL Developer
 - Toad
- CLI
 - sqlplus
 - sqlCl

> **install & mount**

install & mount

```
/mnt/$ sudo apt install ./ddlfs-2.0.deb
```

```
/mnt/$ ddlfs -o \  
username=SCOTT,password=tiger,\  
database=dbhost:1521/dbservice /mnt/demo
```

```
/mnt/$ ls /mnt/demo
```

```
SYS/  SYSTEM/  SCOTT/
```

```
...
```

```
SQL> select logon_time  
       from v$session  
       where username='SCOTT';
```

Demo #2

CREATE and DROP

CREATE and DROP

```
/mnt/demo/SCOTT/PROCEDURE/$ > SP_DEMO.SQL
/mnt/demo/SCOTT/PROCEDURE/$ cat SP_DEMO.SQL
CREATE OR REPLACE PROCEDURE SCOTT.SP_DEMO AS
BEGIN
    NULL;
END;
/mnt/demo/SCOTT/PROCEDURE/$ rm SP_DEMO.SQL
/mnt/demo/SCOTT/PROCEDURE/$ ls
/mnt/demo/SCOTT/PROCEDURE/$ cat ../../ddlfs.log
```

(also run sql queries with `sqlplus` to provide proof that procedure was really created on the database and not as a file on a filesystem)

Demo #3

CREATE OR REPLACE
and debug!

CREATE OR REPLACE *and Debug!*

```
/mnt/demo/SCOTT/PROCEDURE/$ vim SP_DEMO.SQL
/mnt/demo/SCOTT/PROCEDURE/$ cat ../../ddlfs.log
CREATE OR REPLACE EDITIONABLE PROCEDURE "HR"."SP_DEMO" AS BEGIN      dbms_output.put_line('hello world')
END;
.. OCI_SUCCESS_WITH_INFO,
.. ERROR, line 4, column 1: PLS-00103: Encountered the symbol "END" when expecting one of the following:

:= . ( % ;
The symbol ";" was substituted for "END" to continue.

/mnt/demo/SCOTT/PROCEDURE/$ vim SP_DEMO.SQL
/mnt/demo/SCOTT/PROCEDURE/$ cat ../../ddlfs.log
CREATE OR REPLACE EDITIONABLE PROCEDURE "HR"."SP_DEMO" AS BEGIN      dbms_output.put_line('hello world');
END;
.. SUCCESS
```

Demo #4

Search the code

Search the code

```
$ grep -nir ADD_JOB_HISTORY *
```

```
PROCEDURE/ADD_JOB_HISTORY.SQL:1:CREATE OR REPLACE EDITIONABLE PROCEDURE "HR".add_job_history
```

```
PROCEDURE/ADD_JOB_HISTORY.SQL:13:END add_job_history;
```

```
TRIGGER/UPDATE_JOB_HISTORY.SQL:4: add_job_history(:old.employee_id, :old.hire_date, sysdate,
```

Demo #5

Version Control

Version Control (1)

```
$ ddifs -oro,dbro,filesize=-1,schemas=HR,\  
username=SYSTEM,password=temp,\  
database=dbhost:1521/dbservice \  
/repository/database/  
  
$ cd /repository  
$ git init  
$ git add database/  
$ git commit -m "initial commit"  
  
$ fusermount -u /repository/database/
```

Version Control (2)

```
SQL> create table hr.demo (col_a number);
$ ddifs -oro,dbro,filesizes=-1,schemas=HR,\
  username=SYSTEM,password=temp,\
  database=dbhost:1521/dbservice \
  /repository/database/
$ cd /repository
$ git init
$ git add -A database/
$ git commit -m "daily commit"
[master 206bcee] daily commit
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 db/HR/TABLE/DEMO.SQL
$ fusermount -u /repository/database/
```


Gotcha's

- Can only save valid .SQL files
 - vim `~backup` and `.swp` files cannot be stored here.
<https://github.com/usrechnik/ddlfs#tips-for-vim>
 - Subversion and CVS pollute project directory structure with `.svn` folder in each folder.
- Size of `.sql` file cannot be determined before the complete source for specific object is read.
(next is quick demo of `filesize=0` vs `filesize=-1`)

Demo #6

Filesize Gotcha

Filesize - /proc fs

```
$ ls -l /proc/cpuinfo
-r--r--r-- 1 root root 0 okt  4 14:09 /proc/cpuinfo
$ cat /proc/cpuinfo
...
```

filesize=0 (default)

```
$ ddifs -o username=SYSTEM,password=temp,\
filesize=0,\
database=dbhost:1521/db_service /mnt/demo

$ stat demo/HR/PROCEDURE/SP_DEMO.SQL | grep Size
Size: 0 ...

$ tail -f demo/HR/PROCEDURE/SP_DEMO.SQL
# keep file open using »tail« in another sess

$ stat demo/HR/PROCEDURE/SP_DEMO.SQL | grep Size
Size: 110 ...
```

filesize=-1

```
$ ddifs -o username=SYSTEM,password=temp,\
filesize=-1,\
database=dbhost:1521/db_service /mnt/demo

$ stat demo/HR/PROCEDURE/SP_DEMO.SQL | grep Size
Size: 110 ...

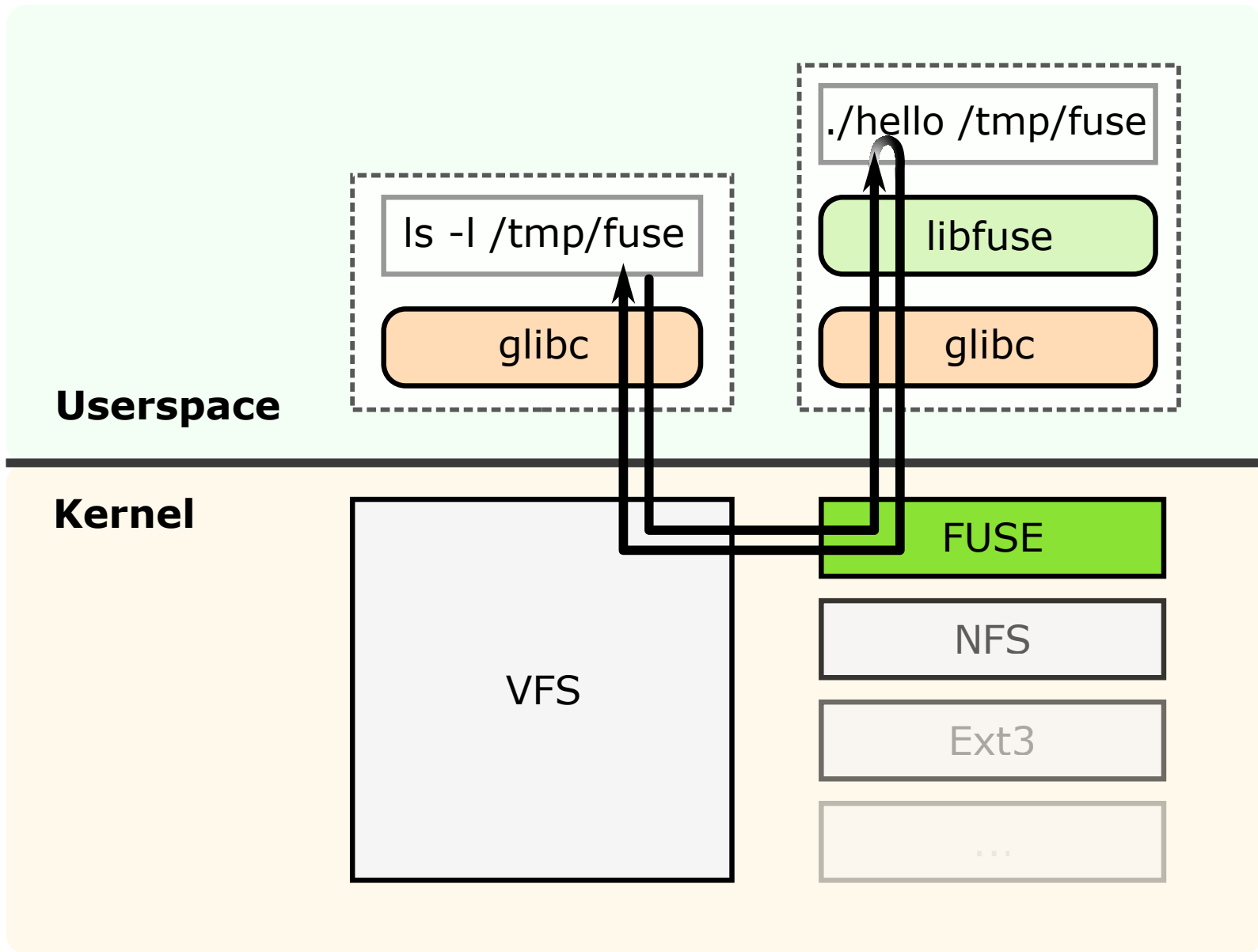
$ tail -f demo/HR/PROCEDURE/SP_DEMO.SQL
# keep file open using »tail« in another sess

$ stat demo/HR/PROCEDURE/SP_DEMO.SQL | grep Size
Size: 110 ...
```

Performance »Tuning«

- For optimal performance with Git & Mercurial try:
 - `ro,dbro,filesize=-1,keepcache,temppath=...`
- You may also avoid network and listener:
 - `username=/,password=/,database=/`
- And allow usage of internal views:
 - `userrole=SYSDBA`

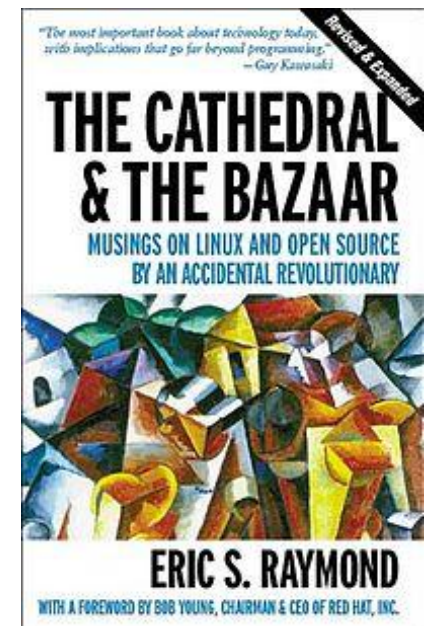
libfuse



Final Thoughts

- *»The next best thing to having good ideas is recognizing good ideas from your users. Sometimes the latter is better.«*
- *»Any tool should be useful in the expected way, but a truly great tool lends itself to uses you never expected.«*

<http://www.catb.org/esr/writings/cathedral-bazaar/>





<http://www.abakus.si/>

