

Monday, August 18. 2008

Less known Solaris Features: CacheFS - Part 4: The Cache

Okay, we have a working CacheFS mount but where and how is the stuff cached by the system. Let's have a look at the cache.[root@gandalf:/var/cache/fs/cache1]# ls -l

```
total 6
drwxrwxrwx 5 root root 512 Aug 18 10:54 0000000000044e30
drwx----- 2 root root 512 Aug 11 08:11 lost+found
lrwxrwxrwx 1 root root 16 Aug 11 08:18 theoden:_export_files:_files -> 0000000000044e30
```

To ensure that caches using a single cache directory of the time aren't mixing up their data, they are divided at this place. At first a special directory is generated and at second a more speaking name is linked to this. It's pretty obvious how this name is generated.=theoden:_export_files:_files can be easily translated to theoden:/export/files mounted at /files

Let's assume we've used the cache for another filesystem (e.g. /export/binaries on theoden mounted to /binaries):[root@gandalf:/var/cache/fs/cache1]# ls -l

```
total 10
drwxrwxrwx 5 root root 512 Aug 18 10:54 0000000000044e30
drwxrwxrwx 3 root root 512 Aug 18 11:18 0000000000044e41
drwx----- 2 root root 512 Aug 11 08:11 lost+found
lrwxrwxrwx 1 root root 16 Aug 18 11:18 theoden:_export_binaries:_binaries -> 0000000000044e41
lrwxrwxrwx 1 root root 16 Aug 11 08:18 theoden:_export_files:_files -> 0000000000044e30
```

With this mechanism, the caches are separated in their respective directories ... no mixing up.

When we dig down a little bit deeper to the directories, we will see an additional layer of directories. This is necessary to prevent a situation where a directory contains too much files and thus slows down.

[root@gandalf:/var/cache/fs/cache1/0000000000044e30/0000000000044e00]# ls -l

```
total 62
-rw-rw-rw- 1 root root 0 Aug 18 10:54 0000000000044e66
-rw-rw-rw- 1 root root 1683 Aug 11 08:24 0000000000044eaa
-rw-rw-rw- 1 root root 29417 Aug 11 08:22 0000000000044eba
```

When you look in on of this file, you will see, that those files are just a copy of the original

files:[root@gandalf:/var/cache/fs/cache1/0000000000044e30/0000000000044e00]# cat 0000000000044eaa
[...]

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[...]
[root@gandalf:/var/cache/fs/cache1/0000000000044e30/0000000000044e00]#At last, the structure of CacheFS for storing the cache is pretty simple. The metadata of the cache (what file is stored in which location) is stored in the root directory of the cache in some dot-files:[root@gandalf:/var/cache/fs/cache1]# [root@gandalf:/var/cache/fs/cache1]# ls -al

```
.*
-rw----- 1 root root 48 Aug 11 08:11 .cfs_label
-rw----- 1 root root 48 Aug 11 08:11 .cfs_label.dup
-rwx----- 1 root root 0 Aug 11 08:11 .cfs_lock
-rw----- 1 root root 109879296 Aug 18 10:54 .cfs_resource
-rw-r--r-- 1 root root 4 Aug 11 08:11 .cfs_unmnt
-rw-r--r-- 1 root root 22 Aug 11 08:11 .nsr
```

[root@gandalf:/var/cache/fs/cache1]All this dot-files in conjunction contain all the metadata necessary to manage and control the cache.