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From: Oliver Lemke
Sent: Friday, July 10, 2015 12:50 PM
To: DL-Service - SW Support
Cc: German Krackow; Ken Hall
Subject: Useful notes on troubleshooting Replication issues

This issue was per SR3559030 with missing replication policies, but offers a lot of good checks and commands for other replication related issues. See summary at end.

Worked by Steve Cole, after being escalated through SES > SUS

Issue: 10 Folders under FS: /Video, each had a replication policy, but they disappeared around 6/16/15

Troubleshooting Methodology:

1) Determine what is actually replicating by command line

- Note I have lines prefixed with 'Source MDC:' or 'Target MDC:' to clarify where commands are run from.

[Checking some of the folders, looking for BLOCKLET:](#)

Source MDC: Run dm_info for folder /Producers

dm_info PRODUCERS

- output shows: 'eventlist: 0x10000000 **BLOCKLET**' indicates replication

```
drwxrwx--- 17 root root 4096 Jun 30 10:43 Shared
[root@mer2-xsan-mdc1 Video]# dm_info PRODUCERS
Filename: PRODUCERS
handle (hex): 0004fb1d6b74809300e00000000034b000000004387800
fsid: 0x0004fb1d6b748093 dev: 19 rdev: 19 aff: n/a
size: 4096 block size: 4096 number of blocks: 8
ino: 70809600 gen: 843 type: S_IFDIR mode: 040770 links: 25
NO extended attribute
objids: NONE
eventlist: 0x10000000 BLOCKLET
region events:
atime = 1436483553 -> Thu Jul 9 17:12:33 2015
ctime = 1436110676 -> Sun Jul 5 09:37:56 2015
mtime = 1430407796 -> Thu Apr 30 09:29:56 2015
[root@mer2-xsan-mdc1 Video]# dm_info Encoding
bash: dm_info: command not found
[root@mer2-xsan-mdc1 Video]#
```

Same under folder 'Encoding':

dm_info Encoding

- output shows: 'eventlist: 0x10000000 **BLOCKLET**' indicates replication

```
[root@mer2-xsan-mdc1 Video]# dm_info Encoding
Filename: Encoding
handle (hex): 0004fb1d6b74809300e0000000006000000000974796
fsid: 0x0004fb1d6b748093 dev: 19 rdev: 19 aff: n/a
size: 0 block size: 4096 number of blocks: 0
ino: 9914262 gen: 6 type: S_IFDIR mode: 040770 links: 10
NO extended attribute
objids: NONE
eventlist: 0x10000000 BLOCKLET
region events:
atime = 1436475096 -> Thu Jul 9 14:51:36 2015
ctime = 1436109693 -> Sun Jul 5 09:21:33 2015
mtime = 1425416191 -> Tue Mar 3 13:56:31 2015
[root@mer2-xsan-mdc1 Video]#
```

[Checking some of the folders, looking for existence of the /.rep_private/config folder, then looking for the replication key:](#)

Source MDC: Under /stornext/<FS>/rep_private/config folder, key and folder info shows for working replication on FS /Creative:

cd /stornext/<FS>/.rep_private/config – where <FS> is the FileSystem name

ls -la

- Note key_xxxxxxxx – this number is actually the folder's inode.

```
[root@mer2-xsan-mdc1 config]# cd /stornext/Creative/.rep_private/config
[root@mer2-xsan-mdc1 config]# ls -la
total 16
drwxrwx--- 3 root root  0 Oct 23  2014 .
drwxrwx--- 11 root root 106 Jun 16 08:30 ..
-rw-rw---- 1 root root 120 Sep 26  2014 CreativeSource
-rw-rw---- 1 root root  70 Sep 26  2014 global
-rw-rw---- 1 root root  91 Aug 27  2014 key_857390160
-rw-rw---- 1 root root 101 Jul 17  2014 target
drwxrwx--- 2 root root  0 Sep 26  2014 tmp
[root@mer2-xsan-mdc1 config]#
```

Use 'more' command on folder to show replication info:

more <FS> – where <FS> is the FileSystem name

- shows rep_output=true

```
drwxrwx--- 2 root root  0 Sep 26  2014 tmp
[root@mer2-xsan-mdc1 config]# more CreativeSource
name=CreativeSource
inherit=global
rep_output=true
rep_target="[0 1 * * *] target://stornext/replications@172.23.0.85:"
[root@mer2-xsan-mdc1 config]#
```

Use 'more' command on key* to show all keys:

more key*

- Note here there should be 10 keys for each of the 10 folders to be replicated, but there is only 1 showing

```
[root@mer2-xsan-mdc1 config]# more key*
inherit=CreativeSource
key=857390160
root=0004FB1D5C8D30CF000E000000000AC00000000331ABC50
[root@mer2-xsan-mdc1 config]# pwd
```

Source MDC: Now a listing of the folders under /Video which has missing replication policies:

```
[root@mer2-xsan-mdc1 stornext]# cd Video
[root@mer2-xsan-mdc1 Video]# ls -l
total 28
drwxrwx--- 8 root root 4096 Jul 18  2014 BlockBuster Assets
drwxrwx--- 16 root root 4096 Jul  9 16:04 BlockBuster Studio
drwxrwx--- 6 root root  0 Jun  9  2014 CHEYENNE
drwxrwx--- 10 root root  0 Jul  7 10:23 CSC Training
drwxrwx--- 6 root root  0 Mar  3 13:56 Encoding
drwxr-x--- 12 root root 4096 Jul  9 10:02 IHS Media
drwxrwx--- 8 root root  0 Jun 16 06:54 MER STUDIO
drwxrwx--- 11 root root 4096 Jul  7 10:23 NextShowVVTR
drwxrwx--- 17 root root 4096 Apr 30 09:29 PRODUCERS
drwxrwx--- 19 root root 4096 Jun 18 11:52 Sales Channel Training
drwxrwx--- 17 root root 4096 Jun 30 10:43 Shared
[root@mer2-xsan-mdc1 Video]#
```

- All these folders had no replication policies and in turn no /.rep_private/config folders (sorry no screenshot)

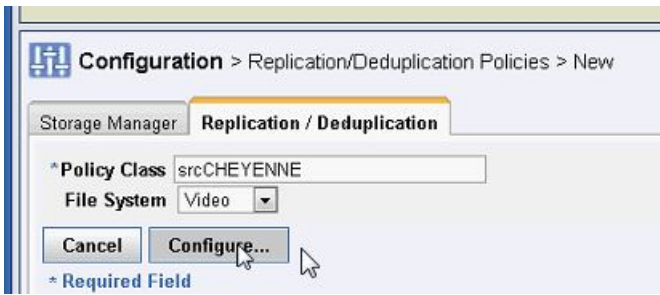
#####

2) We have confirmed that replication policies are missing and that this is not just a GUI issue.

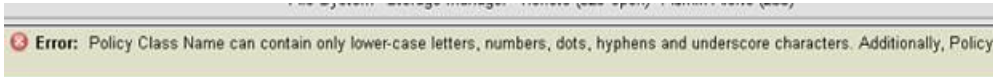
So what's the fix to getting the replication policies back?

Just recreate the replication policy again – no concerns over having to match keys, the keys are inherited from the folder's inode

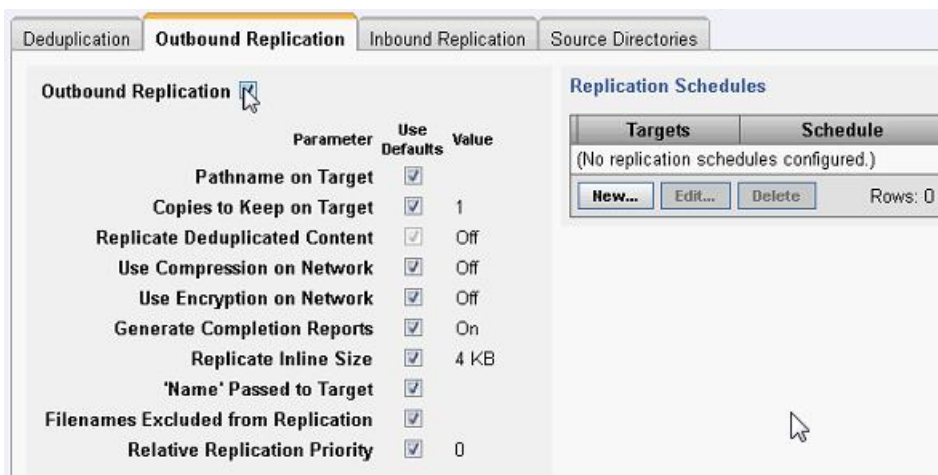
Under GUI:



- Take note, CAPS are not allowed, see screenshot below. Policy Class was just recreated in just lower case.
- Also take note that the naming convention for the 'Policy Class' is just a name and can be called whatever you want. Most likely it reflects the name of what the user is replicating.



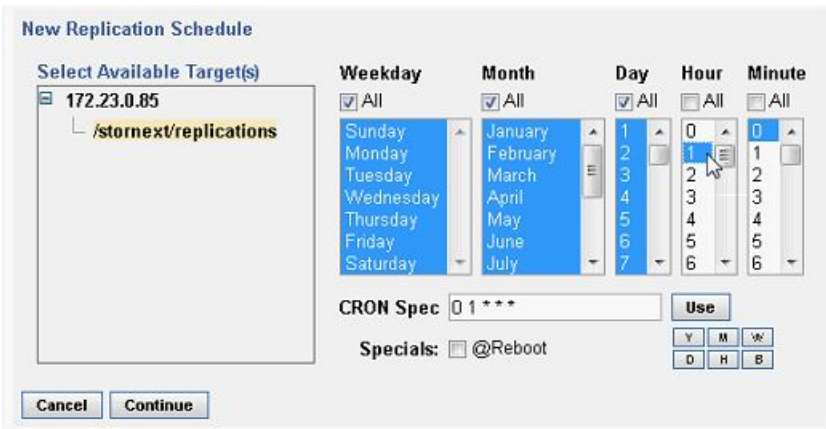
- Make sure 'Outbound Replication' is checked
- Note option 'Copies to Keep on Target' (referenced later in document)



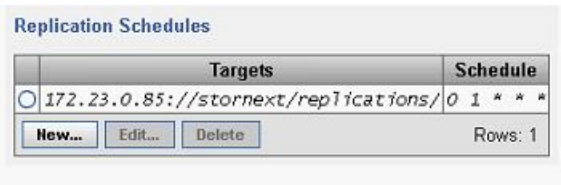
- Now to configure the Target and Schedules
- Select Available Target:



- Define schedule. This one is set for all days, once a day. Good idea to stagger the schedules an hour apart, if there are multiples. For this option select All Weekdays, All Months, All Days (of month), but only 1 of the hourly option – note Cron spec shows below.



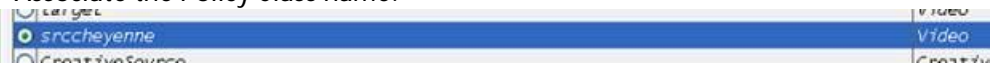
- Now the schedule appears, along with target info:



- Now you have to define the folder or folders within the <FS> that you wish to replicate, in this case it was /Video/CHEYENNE:



- Associate the Policy Class name:

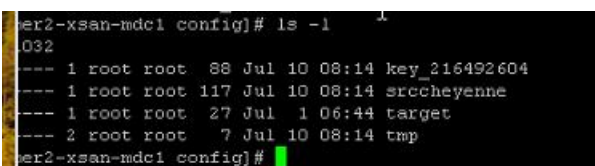


#####

3) Back to the CLI to check the newly configured Replication Policy

Source MDC: Now you will see under /stornext/Video/.rep_private/config, the key and details for Policy Class: srccheyenne:

cd /stornext/<FS>/.rep_private/config – where <FS> is the FileSystem name
ls -l



- Confirm that snpolicyd is running:

```
# ps -ef | grep snpolicyd
```

```
[root@mer2-xsan-mdc1 config]# ps -ef | grep snpolicyd
root      15360 15058  0 Jul01 ?        00:04:07 /usr/cvfs/bin/snpolicyd -H mer2-xsan-mdc1.node-1 p
rocess/snpolicyd mer2-xsan-mdc1.node-1 0
root      46538 49101  0 08:16 pts/1    00:00:00 grep snpolicyd
[root@mer2-xsan-mdc1 config]#
```

The only log that shows replication activity is 'snpolicy.out'

```
# tail -f /usr/cvfs/debug/snpolicy.out
```

- This log snippet shows a missing policy for key 9914261:

```
[root@mer2-xsan-mdc1 config]# tail -f /usr/cvfs/debug/snpolicy.out
(E)[20150710 08:16:44.453784 47346] Policy file for key 9914261 does not exist.
(W)[20150710 08:16:44.453794 47346] No policy for key 9914261, dropped inode 326179094
(E)[20150710 08:16:44.453803 47346] Policy file for key 9914261 does not exist.
(E)[20150710 08:16:44.453810 47346] Policy file for key 9914261 does not exist.
I [20150710 08:16:44.453814 47346] /stornext/Video: queued 0 files for ingest, deferred 0
I [20150710 08:16:44.453819 47346] /stornext/Video: Ingested 0 files 0 Kbytes in 0.000048 secs
```

General: Name of policy (Policy Class) does not matter, just where it is going to and from

Under the snpolicy CLI command, there is a '-repcleanup' command used to clean up issues. Note be cautious of using the -allcopies option, it WILL remove ALL copies which the customer may not want.

```
-repcancel=pathname # cancel pending replication
-repcleanup=mount_path -key=key [-copy=copy][-allcopies] [-path=path]
# cleanup rep target for key
# make copy N policy root or
# remove all copies
-rephistory=pathname [-count=n] # list replication completion info
```

#####

Target MDC: Note replications transferred:

```
root@chy-xsan-mdc1:/stornext/replications
drwxrwx--- 17 root root 4096 Jun 11 04:28 PRODUCERS.4
drwxr-x--- 17 root root 4096 Jun 10 04:02 PRODUCERS.5
drwxr-x--- 17 root root 4096 Jun 6 04:03 PRODUCERS.6
drwxr-x--- 17 root root 4096 Jun 5 04:02 PRODUCERS.7
drwxr-x--- 17 root root 4096 Jun 4 04:02 PRODUCERS.8
drwxr-x--- 17 root root 4096 Jun 3 04:02 PRODUCERS.9
drwxrwx--- 19 root root 4096 Jun 16 05:02 Sales Channel Training
drwxrwx--- 19 root root 4096 Jun 13 05:02 Sales Channel Training.1
drwxr-x--- 19 root root 4096 Jun 2 05:10 Sales Channel Training.10
drwxr-x--- 19 root root 4096 May 27 05:02 Sales Channel Training.11
drwxr-x--- 19 root root 4096 May 23 05:02 Sales Channel Training.12
drwxr-x--- 19 root root 4096 May 22 05:02 Sales Channel Training.13
drwxr-x--- 19 root root 4096 May 21 05:02 Sales Channel Training.14
drwxr-x--- 19 root root 4096 May 20 05:02 Sales Channel Training.15
drwxrwx--- 19 root root 4096 Jun 12 05:15 Sales Channel Training.2
drwxrwx--- 19 root root 4096 Jun 11 05:15 Sales Channel Training.3
drwxr-x--- 19 root root 4096 Jun 10 05:02 Sales Channel Training.4
drwxr-x--- 19 root root 4096 Jun 9 05:02 Sales Channel Training.5
drwxr-x--- 19 root root 4096 Jun 6 05:02 Sales Channel Training.6
drwxr-x--- 19 root root 4096 Jun 5 05:02 Sales Channel Training.7
drwxr-x--- 19 root root 4096 Jun 4 05:02 Sales Channel Training.8
drwxr-x--- 19 root root 4096 Jun 3 05:02 Sales Channel Training.9
drwxrwxr-x 2 root root 0 Jun 11 2014 target01
[root@chy-xsan-mdc1 replications]#
```

- To cleanup, you can also manually remove by hand, you don't have to use the 'snpolicyd -repcleanup' option.

#####

4) Process checks after triggering a manual replication run from the GUI.

Grep for 'Realized'

Grep for "realized" to confirm replication completions:

- If 'realized' is shown the transfer of replicated data was complete!

```
# grep "realized" /usr/cvfs/debug/snpolicy.out
```

```
I Replication completed OK
[root@mer2-xsan-mdc1 config]# grep "realized" /usr/cvfs/debug/snpolicy.out
I [20150710 01:56:59.666021 21140] /stornext/replications: Name space realized at /stornext/replications/OneTen
I [20150710 08:24:15.309767 18645] /stornext/replications: Name space realized at /stornext/replications/CHEYENNE
[root@mer2-xsan-mdc1 config]# ls -l /usr/cvfs/debug/snpolicy.out*
-rw-r--r-- 1 root root 897977 Jul 10 08:25 /usr/cvfs/debug/snpolicy.out
-rw-r--r-- 1 root root 8388698 Jul 9 15:12 /usr/cvfs/debug/snpolicy.out_1
-rw-r--r-- 1 root root 8388706 Jul 8 08:36 /usr/cvfs/debug/snpolicy.out_2
-rw-r--r-- 1 root root 8388658 Jul 2 09:41 /usr/cvfs/debug/snpolicy.out_3
-rw-r--r-- 1 root root 8388707 Jul 1 06:42 /usr/cvfs/debug/snpolicy.out_4
[root@mer2-xsan-mdc1 config]#
```

Snpolicy.out is the only place where replications are logged

#####

Comparing Keys between Source and Target:

Source MDC: Note running ls -lid on the <FS>/Folder will show the folder inode (highlighted)

```
# ls -lid <foldername> - Assuming you are already at the parent level folder or FS.
```

```
432457281 drwxr-xr-x 2 root root 0 Jun 26 15:15 Wea
[root@mer2-xsan-mdc1 Video]# ls -lid CHEYENNE
216492604 drwxrwx--- 6 root root 0 Jun 9 2014 CHEYENNE
[root@mer2-xsan-mdc1 Video]# cd .rep_private/config
[root@mer2-xsan-mdc1 config]# ls -l
total 1032
-rw----- 1 root root 88 Jul 10 08:14 key_216492604
-rw----- 1 root root 117 Jul 10 08:14 srccheyenne
-rw----- 1 root root 27 Jul 1 06:44 target
drwx----- 2 root root 7 Jul 10 08:14 tmp
[root@mer2-xsan-mdc1 config]#
```

...and the inode is actually the Key!

```
total 1032
-rw----- 1 root root 88 Jul 10 08:14 key_216492604
-rw----- 1 root root 117 Jul 10 08:14 srccheyenne
-rw----- 1 root root 27 Jul 1 06:44 target
drwx----- 2 root root 7 Jul 10 08:14 tmp
[root@mer2-xsan-mdc1 config]#
```

Source MDC: Data also relates to the Superblock ID of the <FS>. Run the following to get the <FS> Superblock info:

```
# cvsfdb <FS>
```

```
# cvsfdb> show sb
```

- Epoch # when file system was created:

```
Super Block
sb_marker = 0x5375506552243530 [SuPeR$50]
sb_Epoch = 0x4fb1d6b748093 (Thu Jun 5 15:28:02 2014)
sb_FsStatus = 0x14f14
31BITDIRHASH
METADUMP_NEEDED
BIGEND_QUOTAS
EMBEDDED_CONFIG
UTF8C
RPL_ENABLED
```

Target MDC: You will notice on the target under the defined replications folder /.rep_private/<superblock epoch #>

Target MDC: Under the superblock ID (Epoch #) on the Target MDC, you will see the inode ref for each folder, in this case 211105, then directory copies, then the replicated files:

```
root@chy-xsan-mdc1:/stornext/replications/.rep_private/0004FB1D6B748093/211105/dir_000001
0x122835d.489 0x13ee6b53.147 0x3e9a6ba.165 0xb2b392.405 0xff0718.362
0x122835e.491 0x13ee6b54.149 0x3e9a6bb.166 0xb2b393.406 0xff071b.367
0x122835f.493 0x13ee6b55.151 0x3e9a743.221 0xb2b394.407 0xff071c.368
0x1228360.500 0x13ee6b56.153 0x3e9a747.226 0xb2b395.408 0xff071d.377
0x1228361.502 0x13ee6b57.155 0x3e9a78c.234 0xb2b396.409 0xff071e.378
0x1228362.504 0x13ee6b58.157 0x3e9a78d.235 0xb2b397.410 0xff074e.372
0x1228363.507 0x13ee6b59.159 0x3eabcc4.176 0xb2b398.411 0xff0750.376
0x1239206.110 0x13ee6b5a.161 0x3eabcc5.177 0xb2b399.412 0xff0751.381
0x123920b.115 0x13ee6b5b.163 0x3ebcb3c.239 0xb2b39a.413 0xff0752.382
0x123920f.119 0x13ee6b80.238 0x3ebcb3d.240 0xb2b39b.414 0xff0753.383
0x1239210.120 0x13ef7c00.232 0x3ebcb3e.241 0xb2b39c.415 0xff07f6.390
0x1239212.122 0x13ef7c02.29 0x3ebcb3f.242 0xb2b39d.416 0xff07fa.404
0x1239213.123 0x13ef7da0.621 0x3ede6c5.68 0xb2b39e.417 0xff07fb.406
0x1239214.124 0x13ef7da1.622 0x3f557dd.18 0xb2b39f.418 0xff07fc.408
0x1239215.125 0x13ef7dc4.624 0x3f557de.19 0xb2b3a0.419 0xff07fd.410
0x1239216.126 0x13ef7dc5.625 0x3f67080.114 0xb2b3a1.420 0xff07fe.412
0x1239217.127 0x13ef7dc6.626 0x3f67083.146 0xb2b3a2.421 0xff07ff.413
0x1239218.128 0x13ef7dc7.627 0x3f67084.152 0xb2b3a3.422 0xff6340c.122
0x1239219.129 0x13ef7dc8.628 0x3f67085.160 0xb2b3a4.423
```

On Target Superblock ID:

```
root@chy-xsan-mdc1 [CHEYENNE]# cd ../.rep_private
root@chy-xsan-mdc1 .rep_private]# ls -l
total 4
drwx----- 3 root root 0 Oct 10 2014 0004FB1D6B748093
drwx----- 11 root root 0 Aug 27 2014 0004FB1D6B748093
drwx----- 3 root root 4096 Jun 16 12:09 pending
drwx----- 2 root root 2 Jul 10 02:42 oldest
drwx----- 3 root root 0 Jun 11 2014 pending
drwx----- 3 root root 72 Jul 10 08:26 queued
drwx----- 2 root root 0 Jul 14 2014 source_state
drwx----- 3 root root 0 Jun 11 2014 target
drwx----- 2 root root 8 Jul 10 08:26 target_state
drwx----- 2 root root 8513 Jul 10 08:35 tmp
root@chy-xsan-mdc1 .rep_private]#
```

...and inode:

```
[root@chy-xsan-mdc1 .rep_private]# cd 0004FB1D6B748093
[root@chy-xsan-mdc1 0004FB1D6B748093]# ls -l
total 4
drwx----- 5 root root 0 Jun 13 03:04 211105
drwx----- 4 root root 0 Jun 12 06:17 216492600
drwx----- 4 root root 10 Jul 10 08:26 216492604
drwx----- 15 root root 0 Jun 13 02:44 216492605
drwx----- 34 root root 4096 Jun 16 08:17 70809600
drwx----- 4 root root 0 Jun 16 04:33 9914259
drwx----- 4 root root 0 Jun 16 05:32 9914260
drwx----- 12 root root 0 Jun 16 05:17 9914261
drwx----- 4 root root 0 Jun 12 06:02 9914262
[root@chy-xsan-mdc1 0004FB1D6B748093]#
```

#####

Reviewing Link Counts

Before being "realized" the Link Count on a file (on the Source MDC) will be 1, after it is realized it will be 2

In this example, the customer had a file copy count of 16, but as it was realized, then the Link count is shown as 17.... for 16 copies of the file and 1 for the realization:

```
drwxrwx--- 75 root root 4096 Jun 16 04:03 zach.hendrix
-rw-rw---- 17 root root 1800860 Oct 1 2014 zach.hendrix alias
[root@chy-xaan-mdel PRODUCERS]#
```

#####

5) Summary

There are a number of ways to check that replication is working:

- 1) Check for the existence of a /.rep_private folder under the folder of the <FS>, and corresponding /config folder under that.
- 2) Check for the existence of the key_xxxxxx file and confirm its number against the inode of the folder with ls -lid on the folder.
- 3) Run a 'more <FS>' to confirm replication is set to true.
- 4) Correlate Superblock ID (Epoch #) and folder inode info on Source with Target folders to confirm with customer that the files are present on the Target MDC
- 5) Confirm under Source GUI that the replication schedule is correctly setup to run non the correct days/times. Avoid triggering schedules to run at same time (not sure if there is any real impact of them running at same time, except for load on MDCs, network bandwidth).
- 6) Use link counts on files, comparing against file copies +1 to confirm successful replication.
- 7) Search snpolicy.out for 'realized' to confirm successful transfer
- 8) ...and if the replication policies do go missing, just recreate them. As the key is pulled from the folder's inode , it will always be unique and the same. The policy name would not have to be the same, just the Source and Target folders and of course MDCs.

If a folder is removed and recreated with the same name, I would assume this to be a very different story, as the inode info will be different.

#####

RCA on missing replication policies

- Policies seemed to disappear 6/16, the same time the target was updated from 5.0.1 to 5.2.1, but still this was inconclusive to be the root cause. Essentially there was no RCA here, so we just had to move on and recreate the policies via the source GUI.
- Actions taken: Recreated one policy and let the customer go ahead and recreate all the other himself via the Source GUI.

~~~~~ END ~~~~~

Kind Regards  
Oliver



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