

DNA Evolution 3.1

Troubleshooting and Debugging Guide

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DNA Evolution Troubleshooting and Debugging Guide

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DNA EVOLUTION ARCHITECTURE

DNA EVOLUTION CONTROLLER

The DNA Evolution Controller runs on Linux only. It is now ported onto a Virtual Machine and can also run on Mac.

The DNA Evolution Controller runs a software stack that manages all other DNA processes including the DNA Evolution Archive Manager and Archive Client. It also presents a management web interface. There is one DNA Evolution controller per environment.

Key binaries that are part of the Controller includes:

- JBoss scalable web stack
- Server proxy (Enables network communication for metadata, control and progress with Archive Managers and Archive Clients)

DNA EVOLUTION ARCHIVE MANAGER

The DNA Evolution Archive Manager runs a software stack responsible for archiving data to and from LTO/LTFS devices including standalone tape devices and autoloaders. It also communicates with the DNA Evolution controller for progress, management and heart-beating.

Key binaries that are part of the Archive Manager includes:

- sdna_job (Binary that performs the actual data transfers)
- evo_ticket_processor (App that performs all ticket conversions)
- QtSDNAClientProxyService (Service that maintains an open tunnel with the Server Proxy)
- QtClientServiceProvider (Service that performs browse and other functions local on the system when a user requests an operation from the web)
- tape_changer (App that performs tape movement commands - controlled by dnaltman)
- dnaltman (App that performs all tape related mount, unmount, format commands)
- tape_validate (App that performs tape verification process)
- sdna_ticket_watcher (App for converting CatDV tickets)
- sdna_interplay (App for generating Avid Interplay tickets)
- sdna_interplay_generate (App for manual Avid Interplay runs)
- client_hash (App that uniquely identifies the hardware for licensing)
- devicelockserver (Service that manages a queue for tape devices)

DNA EVOLUTION ARCHIVE CLIENT

The DNA Evolution Archive Client runs a subset of the software stack of the Archive Manager (only the archiving and restore data mover - not the tape management software). It archives data over a network share to the Archive Manager. It also communicates with the DNA Evolution controller for progress, management and heart-beating.

Key binaries that are part of the Archive Manager includes:

- sdna_job (Binary that performs the actual data transfers)
- evo_ticket_processor (App that performs all ticket conversions)
- QtSDNAClientProxyService (Service that maintains an open tunnel with the Server Proxy)
- QtClientServiceProvider (Service that performs browse and other functions local on the system when a user requests an operation from the web)

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- tape_validate (App that performs tape verification process)
- sdna_ticket_watcher (App for converting CatDV tickets)
- sdna_interplay (App for generating Avid Interplay tickets)
- sdna_interplay_generate (App for manual Avid Interplay runs)
- client_hash (App that uniquely identifies the hardware for licensing)

DNA EVOLUTION BINARIES AND LOGGING BASICS

The above section highlights the overall components and binaries. This section shows how to turn on logging for each of the above binaries and a more detailed description of their functionality.

ENABLE LOGGING

Logging will first need to be enabled on each system. To enable logging:

Macintosh

1. Edit the file /etc/syslog.conf

2. Locate the lines:

```
# Save All sdna debug messages in our sdna log file.
```

```
#local1.*          /var/log/sdna.log
```

3. Remove the # symbol from the line that starts with local1.* so that the log entries look like this:

```
# Save All sdna debug messages in our sdna log file.
```

```
local1.*           /var/log/sdna.log
```

4. Find the system logging process by typing the following command on the terminal:

```
> ps ax | grep syslogd
```

5. Locate the line that contains /usr/sbin/syslogd, for example:

```
15 ?? Ss  0:08.89 /usr/sbin/syslogd
```

6. Kill the process with a HUP signal:

```
kill -HUP syslogd_PID
```

Using the process id located from step 5

for example: kill -HUP 15

NOTE: Once you have finished debugging, you should revert the log back to having a comment from step #3 and follow steps 4 - 6 to restart syslogd process without writing to sdna.log

In Linux

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1. Edit the file /etc/syslog.conf

2. Locate the lines:

```
# Save All sdna debug messages in our sdna log file.
```

```
#local1.*                               /var/log/sdna.log
```

3. Remove the # symbol from the line that starts with local1.* so that the log entries look like this:

```
# Save All sdna debug messages in our sdna log file.
```

```
local1.*                               /var/log/sdna.log
```

4. Restart logging using the service command:

```
> service syslogd restart
```

NOTE: Once you have finished debugging, you should revert the log back to having a comment from step #3 and run the command from step #4 to restart logging services.

In Windows

Since the system logging system is not available on Windows. You can enable logging using the dbgview.exe application. This is a Windows debugging tool that's available from the following link:

<http://download.sysinternals.com/files/DebugView.zip>

You can simple download the application and run it.

NOTE: If you are running from Windows 7 system, make sure when you launch it you right click and run as Administrator.

This will collect the same information that would normally be logged to sdna.log on Linux or Mac. In addition, the system will also log the job runs (i.e. sdna-logger.out) to this console as well.

TURNING ON LOGGING

Logging will first need to be enabled on the system (Look at previous section 2.1)

Logging is turned on and off via the following files on each platform:

Windows = HKEY_LOCAL_MACHINE/Software/StorageDNA/DNAClientServices

Mac = /Library/Preferences/com.storagedna.DNAClientServices.plist

Linux = /etc/StorageDNA/DNAClientServices.conf

GENERAL LOGGING TIPS

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Each of the processes described below writes logs which are described in each section below. Look for CRITICAL messages in the log files to determine the key issues.

PLEASE NOTE: Keep in mind that enabling the trace level to 5 should not be left on machines with automated jobs for a long period of time as it can fill up the temp folder.

When investigating issues on Macintosh or Linux, it's always a good idea to examine/collect the logs where stderr is written. On the Macintosh, this file is located at /var/log/system.log and on Linux, this file is located in /var/log/messages. Often times, if there are issues with the filesystem or LTFs, these errors are written to this log.

SDNA-JOB (RUNS ON ARCHIVE MANAGER AND ARCHIVE CLIENT)

This is the main binary that runs the Evolution copy process and reports the progress and statistics of the transfers. It writes locally to the tape drive (on an archive manager) or writes over a network share (on an archive client).

sdna-job writes a catalog entry to the sdnacatalogs network share hosted on the DNA controller. This catalog entry is an XML file with the same filename as the archived file.

If you want to enable logging, you can set the LoggingLevel=1 which will always log the sdnalogger.out file to the temp folder defined on the system. You can set this option in the DNAClientServices (plist, conf or registry file) which should have LoggingLevel listed. You can also set this option from the accessDNA application.

EVO_TICKET_PROCESSOR (RUNS ON ARCHIVE MANAGER AND ARCHIVE CLIENT)

This is the application responsible for ticket conversion. Ticket conversion can include any conversion of web restore tickets, CatDV tickets, AAF tickets, FC XML and Interplay restore tickets. The evo_ticket_processor log files can be enabled if the TraceLevel is set to 5 in the DNAClientServices system settings. Once this happens, all runs of evo_ticket_processor are logged to individual logs files in the <temp>/ticket_convert directory.

QTSDNACLIENTPROXYSERVICE (RUNS ON ARCHIVE MANAGER AND ARCHIVE CLIENT)

This service runs and connects the client machine to the dnaserver and acts as the network tunnel to transfer messages from the dnaserver down to the client. By setting the trace level to 5 in the DNAClientServices you can track issues under /var/log/sdna.log. You will have to restart the service in order to start receiving messages. (Refer to section 3.2 for instructions)

QTCLIENTSERVICEPROVIDER (RUNS ON ARCHIVE MANAGER AND ARCHIVE CLIENT)

This service runs and executes requests to the client machine issued through the QtSDNAClientProxyService from the dnaserver. By setting the trace level to 5 in the DNAClientServices you can track issues in this under the /var/log/sdna.log. You will have to restart the service in order to start receiving messages. (Refer to section 3.2 for instructions)

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SDNASERVERPROXY (RUNS ON CONTROLLER)

This binary is responsible for managing the proxy connection from our archive clients/managers to our dnaserver. The QtSDNAClientProxyService connects to this daemon running on the server and maintains this connection. The tunnel established allows free communication between archive client/manager and the dnaserver. The logs for this can be enabled by changing the DNAClientServices TraceLevel to 5. The logs can be found in the directory `/var/log/sdna/sdna.log` or `/var/log/sdna.log`.

DNALTMAN (RUNS ON ARCHIVE MANAGER ONLY)

This application is the gateway for all of the tape operations. This application controls the mount, unmount, format, ltfsccheck, load and unload tape operations. In addition, dnaltman is used as a wrapper for operations like tape verification. The logs for this can be enabled by changing the DNAClientServices TraceLevel to 5. The logs can be found in a directory called dnaltman under the temp folder.

TAPE_CHANGER (RUNS ON ARCHIVE MANAGER ONLY)

This application is responsible for the actual moving of tapes within the autoloader. The application is called by the dnaltman application when a tape load, unload or request for tapes in a drive is made. The logs for this can be enabled by changing the DNAClientServices TraceLevel to 5. The logs can be found in a directory called tapechanger under the temp folder.

DEVICELOCKSERVER (RUNS ON ARCHIVE MANAGER ONLY)

Responsible for holding device lock during tape operations. This is a service that runs on the archive manager and the archive clients use it to control device locks. The logs for this can be enabled by changing the DNAClientServices TraceLevel to 5. The logs can be found in the directory `/var/log/sdna/sdna.log` or `/var/log/sdna.log.tape_validate` (Runs on Archive Manager only)

This application performs the tape verification process. The logs for this can be enabled by changing the DNAClientServices TraceLevel to 5. The logs can be found in a directory called tapevalidator under the temp folder.

SDNA_TICKET_WATCHER (RUNS ON ARCHIVE CLIENT AND ARCHIVE MANAGER)

This application is responsible for managing the ticket processing when a job is automated. The logs for this can be enabled by changing the DNAClientServices TraceLevel to 5. The logs can be found in a directory called `sdna_ticket_watch` under the temp folder.

SDNA_WORKER_WATCHER - CATDV ONLY (RUNS ON ARCHIVE CLIENT AND ARCHIVE MANAGER)

This application is responsible for managing the catdv database update processing when a CatDV job is automated. The logs for this can be enabled by changing the DNAClientServices TraceLevel to 5. The logs can be found in a directory called `sdna_worker_watcher` under the temp folder.

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SDNA_INTERPLAY - AVID INTERPLAY (RUNS ON ARCHIVE CLIENT AND ARCHIVE MANAGER)

This application is responsible for generating the Interplay tickets when an Interplay job runs (includes archives or restores, manual or automated). The logs for this can be enabled by changing the DNAClientServices TraceLevel to 5. The logs can be found in a directory called sdnainterplay under the temp folder.

SDNA_INTERPLAY_GENERATE - AVID INTERPLAY (RUNS ON ARCHIVE CLIENT AND ARCHIVE MANAGER)

This application is responsible for generating a statistics file when generating a manual interplay ticket. The logs for this can be enabled by changing the DNAClientServices TraceLevel to 5. The logs can be found in a directory called gen-sdnainterplay under the temp folder.

CLIENT_HASH (RUNS ON ARCHIVE CLIENT AND ARCHIVE MANAGER)

Uniquely identifies the client to the dnaserver. This has no logging because it is a simple command line application. However, if the client id that is returned from this application changes after the machine has been registered, then the job will fail to run.

JBOSS (RUNS ON CONTROLLER)

All of the jboss logs which are written to the dnaserver controller . The logs are located in the following directory:

```
/opt/jboss/server/DNABaseServer/log
```

In this directory you'll find the following directories:

1. boot.log - Contains startup logging when jboss is started. Collect this log if you find that jboss will not startup.
2. hibernate.log - This log contains information regarding the database interaction.
3. audit.log - Certain web actions are logged to this location. This is used more auditing more than error reporting.
4. sdnaweb.log - This log contains only web application errors that are reported without all of the additional debugging information.

server.log - The server.log contains all of the logged information from the web server and is the primary log that we use for debugging. You can collect server.log and server.log.1, server.log.2, server.log.x... if they exist.

If you are receiving web application errors or problems logging into the system through the login screen, you can check the web server on the dnaserver. Your first course of action should be to see if the jboss web server process is still running. You can type the following command to see if the web application is running:

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```
> ps ax | grep java
```

The process that you'll be looking for will look like the following:

```
usr/java/jre1.5.0_22/bin/java -server -Xms128M -Xmx512M -Dprogram.name=run.sh -Djava.endorsed.dirs=/opt/jboss/lib/endorsed
-XX:PermSize=128M -XX:MaxPermSize=256M -Xms256m -Xmx512m -Djava.library.path=../lib -classpath
../lib/wrapper.jar:/opt/jboss/bin/run.jar -Dwrapper.key=N0GTal2NOWbTEv6d -Dwrapper.port=32000 -
Dwrapper.jvm.port.min=31000 -Dwrapper.jvm.port.max=31999 -Dwrapper.pid=11629 -Dwrapper.version=3.2.3 -
Dwrapper.native_library=wrapper -Dwrapper.service=TRUE -Dwrapper.cpu.timeout=10 -Dwrapper.jvmid=1
org.tanukisoftware.wrapper.WrapperSimpleApp org.jboss.Main -c DNABaseServer -b 0.0.0.0
```

If you find this is not running, you should collect the log information for the web server before restarting. Once you've collected the logs (see below for details), then restart the application by typing the following command:

```
> service jboss restart
```

FIELD DEBUGGING

DEVICES_NOT_AVAILABLE

This error occurs when data cannot be written to tape. This can occur when the tape hardware itself is not available, the tape selected for the archive or restore is itself corrupted or the device lock server cannot get a lock.

Follow these steps:

1. On the archive manager, check to ensure the DeviceLockServer is running:
On Terminal, type `ps ax | grep Device`
 2. If the server is not running, then restart using “service sdnadevicelockserver start”
 3. Ensure that the tape hardware is visible on the archive manager . To do this:
On Mac: Open Applications->AttoConfig Tool. Here you should be able to see the hardware.
On Linux: On the desktop, you will find a script “check-tapehardware”. Running that script will tell you what hardware is connected.
2. If the tape hardware is connected and the device lock server is running, ensure that the tape is healthy.
Load the tape in a device using the web if needed.
On terminal, run “`lfsck /dev/st0`” (on Linux) “`lfsck 0`” (on Mac)
If the regular lfsck returns with “parsing issues on tape”, then run deep recovery
For deep recovery, run “`lfsck -z /dev/st0` (on Linux) “`lfsck -z 0`” (on Mac)

ARCHIVE CLIENT OR ARCHIVE MANAGER MACHINE IN RED

Sometimes the archive client or archive manager machine will appear in RED. In this case, either the machine is not able to connect the DNA Controller or the Qtclient services on the machine are not running.

To fix first ensure the following:

Determine if the archive client/manager has the correct IP address to contact the DNA Controller.

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On Mac:

- sudo vi /etc/hosts
- Ensure the IP address of the DNA Server is correct.
- If not, change the IP address of the DNA Server line

On Windows:

- Ensure the IP address of the DNA Server is correct.
 - If not, change the IP in the hosts file in C:/windows/system32/drivers/etc
- If the IP address is correct, you will need to restart the Qtservices. To restart:

On Mac Systems:

On terminal, type "ps ax | grep Qt"

```
96 ?? Ss 0:00.06 /Applications/StorageDNA/accessDNA.app/Contents/MacOS/QtClientServiceProvider -e
97 ?? Ss 0:01.60 /Applications/StorageDNA/accessDNA.app/Contents/MacOS/QtSDNAClientProxyService -e
```

To kill both services, run the following:

```
sudo kill -9 96
```

```
sudo kill -9 97
```

NOTE: Your process ID will be different, substitute accordingly

After killing the processes, ensure they have restarted as another process ID. In this example, after killing the processes, it has new process IDs.

```
22507 ?? Ss 0:00.03 /Applications/StorageDNA/accessDNA.app/Contents/MacOS/QtClientServiceProvider -e
22511 ?? Ss 0:00.05 /Applications/StorageDNA/accessDNA.app/Contents/MacOS/QtSDNAClientProxyService -e
```

The archive manager now should be able to connect to the virtual controller.

On Windows Client:

In Windows Client if user is getting the error like "There was a error contacting the client, unable to add job: Connection Refused"

Goto TaskManager and verify if the qtclientserviceprovider process is running. If it is not running then open

Command Prompt - goto C:\ProgramFiles X86\StorageDNA - run qtclientserviceprovider -e

SOURCE_DIRECTORY_NOT_FOUND / NO_DIRECTORIES

Please turn on the logging level to 1 and look at the sdna-logger.log under /tmp to check the error message.

This error happens when the selected source directories is not available(mounted) or has leading/trailing spaces or has unprintable characters in them. PLEASE NOTE: This happens only on the selected sources NOT sub-directories.

Follow these steps:

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1) make sure the sources that you have selected are mounted correctly. Run "mount" command on the mac and df command on the server to see if the mount points are ok.

2) If you are still getting the same errors, check on the source folder itself and see that folder does not have any leading/trailing spaces in it.

e.g "/Volumes/Folder1/Folder2 "

Make sure Folder2 does not have leading/trailing spaces. You can leave the leading/trailing spaces in the folder if you like to but in that case you have to go one level up i.e /Volumes/Folder1 as a source folder rather than picking up Folder2 with spaces as a source.

This should help you resolve the issue

FILES_VANISHED / FILES_SKIPPED

This error occurs when SDNA is unable to read files either from the source disk (Archiving) or read from the tape (Restoring)

Turn on logging level and gather info from the sdna-logger.out

During Archiving (File Vanished)

If this error occurs, go ahead and browse to the source directory and see if the files are actually present in the source directories. Often, during the scanning phase files will be identified for archiving, but the file can be moved during the archive itself. In this case SDNA will report File_Vanished

During Restore (File Vanished)

This happens when SDNA is not able to read the files from the tape during a restore. You will have to mount the tape manually and verify that the files are present on the tape. This can be happening because of unprintable characters or can happen when the tape itself has some errors.

To fix:

- Mount the tape manually from the web
- Via Terminal ONLY, browse to the directory and list the files that are giving you issues
- Manually attempt to copy the problematic file
- If the file copy succeeds, it is most probably an "unprintable character" issue (NOTE: This has been fixed as of release *TC)
- If the file does not copy back even with a manual copy, the tape needs to have lfsck run. Use the instructions described earlier in DEVICES_NOT_AVAILABLE.

DELETING PROXIES

Proxies have to be deleted when the customer wants to reformat a tape and restart archiving.

e.g if there is a tape name SDNA01 that has to be reformatted, then make sure

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- 1) you have all the source data associated with that tape
- 2) once you verify that, move the proxies associated with that tape to the temp location

To fix:

```
ssh to the dnaserver (username: root, password: dna180)
goto, cd /sdna_fs/PROXIES/ARCHIVE/ARCHIVENAME/1
grep -RI "tapeid=\"SDNA01\"" . | wc -l (this command will give you a count of all the files for the tape
SDNA01)
grep -RIZ "tapeid=\"UN0119\"" . | xargs -0 rm (Once you do a count, you run this command to
remove the proxies associated with the tape)
```

CATALOG_DIRECTORY_NOT_FOUND

Turn on logging. Check out the sdnalogger.out file and see what error it is throwing.

This error happens when the sdnacatalogs share is not shared(mounted) correctly on the archive manager or archive client machines.

On a Mac system:

Verify by going into /Volumes/sdnacatalogs exists and there is no other instance like sdnacatalogs-1 folder exist.

```
If there is then you will have to run
sudo umount /volumes/sdnacatalogs-1
sudo umount /Volumes/sdnacatalogs
sudo rmdir /Volumes/sdnacatalogs-1
sudo rmdir /volumes/sdnacatalogs
After you verify this, run, sudo automount -vc
```

This will automount all the shares on the mac

On a Windows system:

If this error is occurring on a windows machine, then access \\dnaserver and the sdnacatalogs share from Windows explorer. This issue mostly arises on the mac.

You will see the detailed error in the sdnalogger.out

LOG_DIRECTORY_NOT_ACCESSIBLE

Turn on logging. Check out the sdnalogger.out file and see what error it is throwing.

This error happens when the admindropbox share is not mounted.

Please follow the same instructions as above for admindropbox as well.

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One more place you will see the entry is under /etc/auto_sdna file and verify the entry as mentioned below.

```
/Volumes/admindropbox -fstype=smbfs ://GUEST:@dnaserver/admindropbox
```

If the entry does not exist please edit the file (sudo vi /etc/auto_sdna) and add the entry in it.

Once added, run "sudo auto mount -vc"

check the mount points to see the admin Dropbox is mounted

CONNECTION_REFUSED

This will happen when the QtClientServiceProvider is not running or needs to be restarted due to an IP address change.

On Mac Systems:

On terminal, type "ps ax | grep Qt"

```
96  ??  Ss    0:00.06 /Applications/StorageDNA/accessDNA.app/Contents/MacOS/QtClientServiceProvider -e
97  ??  Ss    0:01.60 /Applications/StorageDNA/accessDNA.app/Contents/MacOS/QtSDNAClientProxyService -e
```

To kill both services, run the following:

```
sudo kill -9 96
```

```
sudo kill -9 97
```

NOTE: Your process ID will be different, substitute accordingly

After killing the processes, ensure they have restarted as another process ID. In this example, after killing the processes, it has new process IDs.

```
22507  ??  Ss    0:00.03 /Applications/StorageDNA/accessDNA.app/Contents/MacOS/QtClientServiceProvider -e
22511  ??  Ss    0:00.05 /Applications/StorageDNA/accessDNA.app/Contents/MacOS/QtSDNAClientProxyService -e
```

The archive manager now should be able to connect to the virtual controller.

On Windows Client:

Goto TaskManager and verify if the qtclientserviceprovider process is running. If it is not running then open

Command Prompt - goto C:\ProgramFiles X86\StorageDNA - run qtclientserviceprovider -e

This will start the service and you should be able to establish connection with the client

UNABLE TO REACH WEB INTERFACE

If you are not able to reach the web, first try clearing your browser's cache:

On Firefox, goto Tools->Clear History

If you are still unable, follow these steps:

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Login to the DNA Controller

Stop Jboss by typing, "service jboss stop"

Delete Jboss logs by:

```
cd /opt/jboss/server/dnaserver/
```

NOTE: ensure you are in this directory by doing a pwd (VERY IMPORTANT FOR NEXT STEP)

```
rm -rf tmp work log data
```

Restart Jboss by typing "service jboss start"

Ensure JBoss is running by typing "ps ax | grep jboss"

UNABLE TO START JOB

This error is rare but sometimes you will find that even after hitting the start button, you won't be able to start the sdna-job. These errors are more common on mac clients.

Check the sdna-job process and check what is going on with the job:

```
Run, ps ax | grep sdna-job
```

If the job has kicked off, you will see a process sdna-job showing you a guid and job-id on the screen.

But if the job is not getting started then it will show you an sdna-job process with an ending process (E) process mark. This means that the previous run could not end correctly and is still in the ending state.

You can resolve this by:

- restarting the mac client

- delete the existing Archive Job and the Restore Job and recreate them with the new Job Guid. Once recreated you should be able to start the job. PLEASE NOTE: The ending process will continue to exist until you restart the mac. So the best option will be to restart the mac and continue with the run.

FILES_MISSING

Check the report on the web. If the report on the web does not list you the files that are not getting archived then,

Turn on Logging and check the sdna-logger.log file.

The sdna-logger.out should give you a list of all the files that is missing and should also give you brief description on what is wrong with those files.

On occasion, some unicode characters present in the file are unprintable characters and prevents the the files from being archived. From the sdna-logger.out, you can find those files and then go to the source to visually inspect the file and the offending character. Often times, the end user is unaware of these characters and often times rename the file and re run the job. This should fix the issue.

But if the client does not want to rename the file then you will have to contact StorageDNA and send us the sdna-logger.out files.

UNABLE TO SEARCH FILES (RE-INDEXING THE ARCHIVE)

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Reindexing is required when the customer is unable to search for files or clips.

Reindexing can be done from

- 1) Web - Goto Archive Settings Tab and then reindex the Archive
- 2) ssh to the dnaserver - Run "cd /opt/sdna/bin"

There is a reindexall.sh script that you can run that will reindex all the Archives

NETWORK BANDWIDTH

If the customer is complaining about bandwidth, please ensure the networking and not going over a wrong switch.

To determine networking hops,

run `tracert dnaserver(hostname or ipaddress of the dnaserver)`

Once verified,

there are network performance tools that you can run on the dnaserver like IPerf to get the performance rating.

You can also try restarting the switch, changing the ethernet cables and finally changing the switch if needed to troubleshoot the issue further. In the past we have seen bandwidth issues caused by bad cables and switches.

UNABLE TO LOAD TAPES

When you are not able to load tapes from the web interface check the devicelockserver service on the archive manager.

make sure the devicelockserver service is running fine by running the following from terminal,

```
ps ax | grep Device
```

if not running then restart the service by " `service sdnadevicelockserver start` "

If you are still not able to load and unload tapes try getting the exit code from the library tool.

DNASERVER IPADDRESS CHANGED

If the dnaserver ipaddress has changed, the clients are going to be offline and shown in RED.

To bring them back online, modify the /etc/hosts file with the correct new ipaddress of the dnaserver.

On Mac:

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sudo vi /etc/hosts
Change the IP address of the DNA Server line

On Windows:

Change hosts file in C:/windows/system32/drivers/etc

UNABLE TO ACCESS TAPE

This error occurs when you are archiving to the tape and the tape is not accessible.

Make sure the tape is unlocked and is writable. There is a red tab in front of the tape that needs to be open and not locked. Once you make the tape writable, re run the job and the archiving should re-start.

TICKET NOT CONVERTING

When the user attempts to add tickets from either web restore or from the Add Ticket button, sometimes the ticket will not convert properly and will need some additional debugging. If you receive the message, "Some tickets did not convert properly" or you see tickets that contain errors in the list of ticket files. You can try turning on the debugging flag TraceLevel to 5 (on the archive client or archive manager) where the ticket is being browsed from. Then attempt to add the ticket again. If you still see an error you can collect the logs located in /tmp/ticketconvert and find the corresponding ticket files that get generated and send those to support for inspection.

DEVICE MISSING AND TAPE MISSING FROM AUTOLOADER

Reason1.autoloader may be offline you can check this in mac by checking the atto config tool and in Linux by the command "lsscsi"

lsscsi -g (to check the status of the auto loader)
mtx status

1. Turn on the logging level by

Mac:

vi /Library/Preferences/com.storagedna.DnaClientservices.plist
turn on trace level login to 5 (default 1)it is to get dnaltman logs,ticket converter logs,lfts logs
Another basic login is Logging level which should be changed to 1, by default it is 0

the log files "sdna-logger.log " will be created in the location cd /tmp.

>> less sdna-logger.log and search for word 'Critical'
check for mac- libctl status (used by dnaltman to change tape)
libctl -help (to check the status of auto loader)

2. Check the autoloader LED error codes and compare it with hp error codes.

3. Try restarting autoloader in the below order

restart the autoloader first let the green light become stable then turn on the machine to which it is connected.

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To check how many drives are connected in Linux

Lsscsi -g
Mtx status

TO RESTART SERVICES ON THE CONTROLLER

- Run the restart all.sh script
- under /opt/sdna/bin

VIRTUAL TAPE SET-UP

To create a virtual tape follow the below steps:

1. Create a "VRTAPE" folder under "Storagedna" shared folders .
2. Change the folder permission by `chmod -R 777 VRTAPE` and also copy the location address of the folder
3. Goto the path => `vi /Library/Preferences/com.storagedna.DNAClientServices.plist`
4. Append the below lines at the end but before `</dict></plist>`
5. `<key>Disk Path</key>`
`<string>Users/sdna/Desktop/SDNA/VRTAPE</string>`
`<key>Disk Path Name</key>`
`<string>VRTAPE</string>` save and exit the file.
6. Login to database "mysql -u root -p AdminDNA" with password ""
7. `select * from dnalt_tape;` (shows only one row) and check for columns by `show columns from dnalt_tape;`
8. Insert the tape values by :
`insert into dnalt_tape`
`values(1,CURRENT_TIMESTAMP,'SYSTEM',1,"",0,"",0,CURRENT_TIMESTAMP,"1499758592,1499758592`
`,0,'L5','VRTAPE',"",1979-12-31 16:00:00,"",0,1979-12-31 16:00:00,"",0,0);`
9. `Select * from dnalt_tape`(shows only one row)
10. log out of dna server
11. goto => `vi /Library/Preferences/com.storagedna.DNAClientServices.plist` and check whether all share folders are pointing to correct location.

UNDIAGNOSED ERROR

Reason: Tape corrupted

Solution: Run consistency & deep recovery test if that doesn't fix reformat the tape

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ISSUES FOUND DURING ARCHIVE: SOURCE OR TARGET DIRECTORIES FOR THIS TRANSFER APPEAR TO BE MISSING

Reason: 1) The source name may be renamed before running the archive

2) The source might be deleted before running the archive

Solution: Avoid renaming & deleting files/folders once it is assigned for archive or restore

THE NUMBER OF FILES SELECTED TO TRANSFER DOES NOT MATCH THE NUMBER OF FILES ACTUALLY TRANSFERRED. ERROR WRITING THE CONTENTS OF THIS FILE.

Reason: 1) if the archive job starts while some copy transfers is happening to the selected folders

2) If the restore partition is too small

Solution: Avoid copying files to the selected folders while archive job is running and try to restore the job according to the partition size

UNABLE TO ACCESS TAPE FOR READING OR WRITING

Reason: If the archive is done with the tape's write protection in locked state.

Solution: Check the write protection of the tape before running the archive.

UNABLE TO PERFORM OPERATION. TAPE DRIVE MAY BE IN USE

Reason: If you try to do more than one operation at a time

YOUR REQUEST TO FORMAT TAPE THE DEVICE COULD NOT BE COMPLETED. UNABLE TO FORMAT TAPE.

Reason: The tape must be unmounted before formatting it.

DEVICE HAS NO MEDIA

Reason: If you try to mount a tape with no tapes loaded into the drive

YOUR REQUEST TO VERIFYTAPE THE DEVICE COULD NOT BE COMPLETED.UNABLE TO VERIFY TAPE.THE TAPE MUST BE UNMOUNTED BEFORE THIS OPERATION CAN BE PERFORMED.

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Reason: Tape needs to be unmounted before running the verification

DELETING THE CATALOG ENTRIES

In Linux:

Goto the path directory `../sdna_fs/PROXIES/ARCHIVES`

And then run `rm -rf *`

In Mac:

Login to the server

Ssh `root@dnaserver`

Password: `dna180`

Goto the path directory `../sdna_fs/PROXIES/ARCHIVES`

And then run `rm -rf`

TO GET THE LIST OF FILES IN THE SPECIFIC TAPE SERIAL

1. Open the terminal app in the Mac and type `ssh root@dnaserver`

Username: `root`

Password: `dna180`

2. `grep -RI "tapeid=\"tapeserial\"" /sdna_fs/PROXIES/ARCHIVES/ARCHIVENAME > /sdna_fs/ADMINISTRATORDROPBOX/primary/tapeserial.out`

This will create a file under Admin Dropbox on the web with the `serial.out(000001.out)` file and that will have all the files related to that tape serial in it.

TO GET THE LIST OF FILES IN THE ARCHIVE

1. Open the terminal app in the Mac and type `ssh root@dnaserver`

Username: `root`

Password: `dna180`

2. Under this path `>> cd /sdna_fs/Proxies/ARCHIVES/archivename/1`

3. You need to type `grep -RI . *|wc -l`

4. `grep -RI . *> /tmp/archivename.out`

This will create a file under tmp directory

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UPDATING THE DATABASE

UPDATING TAPE DETAILS IN THE DATABASE

While importing the tape there are situation in which the tape serials would not get updated.

In this case the restore fails with error message "no tape is identified" (no further archives are allowed in Imported tapes only the restore is possible)

1. Login to the database :mysql -u root -p AdminDNA
password: ""
2. select * from dnalt_tape:
- 3.show columns from dnalt_tape;
- 4.Update the columns by
- 5.insert into dnalt_tape values(119,'Cuurent
TIMESTAMP','SYSTEM',1,"1","","CURRENT:TIMESTAMP","1499758592,1499758592,0,'L5','FI
L981',"','1970-01-04 19:00:00',"','");

TO CHANGE THE AGENT VERSION

After upgrading the system if the Agent version is not updated with new version then login to the database and update the below table:

```
Select * from client_machine;  
update client_machine set clientversion='New version' where id=1;
```

ADDING AN AUTOLOADER TO THE ARCHIVE MANAGER

To update the database with autoloader entry

- 1.log into mysql
mysql -u root -p AdminDNA
Password
- 2.Select * from autoloaders;
- 3.if there is no autoloader config then
insert into autoloader values(1,CURRENT_TIMESTAMP,'SYSTEM',1,0,'changer0','HP AUTOLOADER',8(no
of slots),'HP');
- 4.And also update the Client_machine_devices table
update client_machine_devices set fk_autoloaders_id = 1 where id=3;

TO UPDATE LTFS VERSION

Check for Ltfs version by ltfs -V
uname -s

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you can update by getting new version from => HP lufs => HP StoreOpen Standalone Download

login using : support@storagedna.com
password:""

Unzip and install the downloaded updated version.

COMMAND LINE SCRIPTS:

TO MOUNT:

To mount a tape through script

In Linux:

```
/usr/local/bin/lufs /mnt/lto/st0
```

In Mac:

```
Sudo /usr/local/bin /mnt/lto/0
```

TO UNMOUNT

To Unmount a tape through script

In Linux

```
umount /mnt/lto/st0
```

In Mac

```
umount /mnt/lto/0
```

TO FORMAT

To format a tape through script

In Linux:

```
Sudo /usr/local/bin/mklufs -d st0 -f -s "DNA600" -n "DNA600"
```

In Mac:

```
Sudo /usr/local/bin/mklufs -d 0 -f -s "DNA600" -n "DNA600"
```

TAPE CONSISTENCY CHECK

To run a lufsck (tape consistency check)

In Linux:

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```
ltfsck /dev/st0
```

In Mac:

```
Ltfsck /dev/0
```

DEEP RECOVERY

To run a deep recovery

In Linux:

```
ltfsck -z /dev/st0
```

In Mac:

```
Ltfsck -z /dev/0
```

TO DUPLICATE

To run a duplicate script

In Linux:

Under the path >> cd /opt/sdna/bin

```
./ltfs_copy -source st0 -target st1 -serials DNA601L6:DNA602L6,DNA601L6:DNA603L6
```

Note: Make sure you are including the LTO type (L5,L6) after the tape serial

TO IMPORT

To run a import through script

In Linux:

Under the path >> cd opt/sdna/bin/

```
./ltfs_import -archive ImportTest -serials DNA601 -source st1
```

In Mac:

Under the path >> cd ApplicationsStorageDNA/accessDNA.app/Contents/MacOS

```
sudo /ltfs_import -archive ImportTest -serials DNA601 -source 0
```

Note: Make sure the importing tape serial is not present in the tapelist under “My Tape” before running the import

BULK FORMAT

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There is already a `format_chager.sh` script that gets laid down on `dnaserver` with the install. You can use the same script to format tapes in bulk.

On the Linux Archive Manager:

copy the script in `/opt/sdna/bin` on the `dnaserver`.

Once done copying, Make sure you are in the `/opt/sdna/bin/` directory

```
cd /opt/sdna/bin/ and
```

Run,

```
./format_changer.sh -tape tape-device-id [-force] tape-serial-1 [tape-serial-2 ...]
```

e.g.

```
./format_changer.sh -tape st0 000001 000002 000003...
```

On the Mac Archive Manager:

If the Autoloader is connected to the mac, the same script `format_changer.sh` exists in the `/Applications/StorageDNA/accessDNA.app/Contents/MacOS/` folder. `cd` to the folder and

run the command, Make sure the format is run with `sudo`

```
sudo ./format_changer.sh -tape 0 000001 000002 000003...
```

Note : This is considering all the tapes are brand new and has never been formatted before. If there are any tapes that has been formatted before and you want to reformat the tape again, make sure you remove the tape serial from MYTAPES tab first and the use the force option to reformat the tape.

You can also run the `format_changer` script with force but make sure to double check the tapes that you are not forcefully formatting an already existing tape that the customer is using with the Archive. Its safe to not use force format in bulk format

IMAGING A NEW CENTOS SYSTEM VIA A KICKSTART

Steps to reimage the server with CentOS and starting the kickstart file at the time of installation

First download the FULL dvd install iso from www.centos.org
http://isoredirect.centos.org/centos/6/isos/x86_64/ will be a list of mirrors.

2) download the links on one of the mirrors pages:

CentOS-6.4-x86_64-bin-DVD1.iso

CentOS-6.4-x86_64-bin-DVD2.iso

DO NOT get the LIVE iso or the minimal iso files that these will not have all the packages that we need.

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you may have to try different mirrors to see what is faster.

Second to install the OS. Boot the DVD of Centos 6.4 64 bit and then during the install splash screen, press ESC to get to a command prompt and type:

```
linux ks=http://http://kickstart.suman.fastmail.fm/centos6-sata-ks.cfg
```

This should download the kickstart file and you should all be set.

Note: If the server is not connected to internet try downloading the kickstart file from another machine which has internet connection and copy it into a usb key which should be FAT formatted.

During the install splash screen, press ESC to get to a command prompt and type:

```
linux ks=hd:sdb1:/pathtoks.cfg
```

RUNNING A MANUAL BACKUP

- 1) to backup the database and catalogs make sure that the backup key is mounted at /media/BACKUP [run the command on linux controller: df] 2) kick off a backup by running: /etc/cron.daily/sdna-backup
- 3) verify that the catalogs and ldap and mysql is backed up on the key by going to directory /media/BACKUP