Compliance Procedure

Title: **Backup Tape Exchange Procedure**
Reference Number: 3.4.2.1

Purpose

The purpose of this compliance procedure is to define the procedure in place with regard to accomplishing the daily movement of tape media produced during nightly/daily system backups to an offsite location. The offsite tape exchange location is referred to in the Disaster Recovery Plan.

Tape exchange processing is by standard a Monday thru Friday / 8am to 5pm practice. However, removal and retrieval of tape media is required outside this defined timeframe.

OCCS utilizes industry standard tape management software by Tivoli.

Procedures & Related Information

Operators monitor four (4) different tape libraries. Each one has its own unique numbering system. System Name & sample number scheme are listed below:

Bimini – LT####   RealGar – PC####L1 & PC####L2   Lithium – PC89##L2   Guana –OF####

Operator is to review the hourly log for tape movement from each system. A tape status of "Full" requires that tape to be removed and placed in a "Vault" status. Note the example in the hourly activity log displayed below:

```
/tmp/hold1        Mon Jan 29 15:00:31 2007        1
ANS8000I Server command: 'select library_name from libraries'

LIBRARY_NAME
------------------
DEATHSTAR

If this number gets above 98% contact unix support.
ANS8000I Server command: 'q db'

Available    Assigned    Maximum     Maximum     Page     Total      Used      Pct    Max.
  Space      Capacity    Extension   Reduction   Size     Usable     Pages     Util   Pct
  (MB)        (MB)        (MB)        (MB)       (bytes)   Pages                       Util
---------    --------    ---------   ---------   -------   ---------  ---------  -----  -----
 36,888      36,888          0        18,040     4,096    9,443,328  4,828,864  51.1   51.1

ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name=<------------------>'
ANR2034E SELECT: No match found using this criteria.
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT0056''

VOLUME_NAME          STATUS              STGPOOL_NAME
------------------   ------------------  ------------------
LT0056               FILLING             COPYPERM
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT0184''

VOLUME_NAME          STATUS              STGPOOL_NAME
------------------   ------------------  ------------------
LT0184               FILLING             COPYSECR
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1098''

VOLUME_NAME          STATUS              STGPOOL_NAME
------------------   ------------------  ------------------
LT1098               FILLING             COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1111''

VOLUME_NAME          STATUS              STGPOOL_NAME
------------------   ------------------  ------------------
LT1111               FILLING             COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1133''

VOLUME_NAME          STATUS              STGPOOL_NAME
------------------   ------------------  ------------------
LT1133               FILLING             COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1142''

VOLUME_NAME          STATUS              STGPOOL_NAME
------------------   ------------------  ------------------
LT1142               FILLING             COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1148''

VOLUME_NAME          STATUS              STGPOOL_NAME
------------------   ------------------  ------------------
LT1148               FILLING             COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1165''
```

```
/tmp/hold1        Mon Jan 29 15:00:31 2007        2

VOLUME_NAME            STATUS              STGPOOL_NAME
-----------------      ---------------     ------------------
LT1165                 FILLING             COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1176''

VOLUME_NAME            STATUS              STGPOOL_NAME
-----------------      ---------------     ------------------
LT1176                 FILLING             COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1187''

VOLUME_NAME            STATUS              STGPOOL_NAME
-----------------      ---------------     ------------------
LT1187                 FILLING             COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1196''

VOLUME_NAME            STATUS              STGPOOL_NAME
-----------------      ---------------     ------------------
LT1196                 FILLING             COPYARCHIVE
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1226''

VOLUME_NAME            STATUS              STGPOOL_NAME
-----------------      ---------------     ------------------
LT1226                 FILLING             COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1248''

VOLUME_NAME            STATUS              STGPOOL_NAME
-----------------      ---------------     ------------------
LT1248                 FULL                COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1269''

VOLUME_NAME            STATUS              STGPOOL_NAME
-----------------      ---------------     ------------------
LT1269                 FILLING             COPYARCHIVE
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1308''

VOLUME_NAME            STATUS              STGPOOL_NAME
-----------------      ---------------     ------------------
LT1308                 FILLING             COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1309''

VOLUME_NAME            STATUS              STGPOOL_NAME
-----------------      ---------------     ------------------
LT1309                 FULL                COPYTAPEPOOL
ANS8000I Server command: 'select volume_name,status,stgpool_name from volumes where volume_name='LT1313''

VOLUME_NAME            STATUS              STGPOOL_NAME
-----------------      ---------------     ------------------
LT1313                 FILLING             COPYTAPEPOOL
ANS8000I Server command: 'q pr'

 Process     Process Description      Status
  Number
 --------    --------------------     ------------------------------------------------
```

Note in the example, tapes LT1248 and LT1309 are "Full". These tapes should be recognized as being ready for removal from the system.

Location of the "Full Tape" is found by looking under the middle column titled STATUS. The status of Filling and Full are shown in the above log.

Operator will remove Full tape(s) and place them in vault status using the proper tape management system commands in "Tivoli".

From: Lithium <lithium@odu.edu>

Recipients: bkuplog@odu.edu

Subject: Daily Backup Results

Date: 07:09:59 AM Yesterday

```
IBM Tivoli Storage Manager
Command Line Administrative Interface - Version 5, Release 3, Level 2.0
(c) Copyright by IBM Corporation and other(s) 1990, 2005. All Rights Reserved.

Session established with server LITHIUM: Windows
  Server Version 5, Release 3, Level 2.0
  Server date/time: 01/30/2007 07:10:00  Last access: 01/29/2007 07:10:00

ANS8000I Server command: 'run daily'

# of Scratch Tapes in HP Tape Library
-----------------------------------
                    39

Lithium DBTAPES to go to the OFFSITE location
-----------------------------------------
PC8998L2
PC8997L2

Lithium DBTAPES to be in HP Tape Libary
-----------------------------------------
PC8996L2
PC8995L2
PC8999L2
PC8994L2
```

Date/Time	Volume Type	Backup	Backup	Volume
Device Class	Volume Name		Volume Location	
Command		Series	Operation	Seq
01/25/2007 06:45:36	BACKUPFULL	362	0	1
LTO_MSL_1	PC8996L2			
01/26/2007 06:45:20	BACKUPFULL	363	0	1
LTO_MSL_1	PC8995L2			
01/27/2007 06:45:46	BACKUPFULL	364	0	1
LTO_MSL_1	PC8999L2			
01/28/2007 06:45:31	BACKUPFULL	365	0	1
LTO_MSL_1	PC8994L2		VAULT	
01/29/2007 06:45:21	BACKUPFULL	366	0	1
LTO_MSL_1	PC8998L2			
01/30/2007 06:45:43	BACKUPFULL	367	0	1
LTO_MSL_1	PC8997L2			

Scheduled Start	Actual Start	Schedule Name	Status
01/30/2007 05:00:00	01/30/2007 05:00:24	COPY_PRIMARY-1_TO_SECOND-	Completed

Note in the above example, tapes PC8998L2 and PC8997L2 are marked as "Offsite". These tapes should be recognized as being ready for removal from the system.

Note in the above example, tapes PC8996L2, PC8995L2, PC8999L2, & PC8994L2 are marked as "To Be in HP Tape Library. This list allows the operator to verify that all onsite tape are present in the library.

Operator will remove and add DB tape(s) using the proper tape management system commands in "Tivoli".

"Mr. Tivoli"
<tivoli@ODU.EDU>

02/02/2007 02:03 PM

To thendric@ODU.EDU, nhenley@ODU.EDU,
ljackson@ODU.EDU, jkreul@ODU.EDU,
.awheeler@ODU.EDU, firvisjr@ODU.EDU,

cc

bcc

Subject Hourly Log

```
IBM Tivoli Storage Manager
Command Line Administrative Interface - Version 5, Release 3, Level 2.0
(c) Copyright by IBM Corporation and other(s) 1990, 2005. All Rights Reserved.

Session established with server QUARTZ: Windows
  Server Version 5, Release 3, Level 3.0
  Server date/time: 02/02/2007 14:00:00  Last access: 02/02/2007 13:00:00

ANS8000I Server command: 'run hourly_schedule'
ANR8346I QUERY REQUEST: No requests are outstanding.
ANR2034E SELECT: No match found using this criteria.
ANR2034E SELECT: No match found using this criteria.

Number of Free Slots in 136t_3
------------------------------
                             1

Number of Free Slots in 136t_4
------------------------------
                             2

Number of Scratch Tapes in 136t_3
---------------------------------
                               4

Number of Scratch Tapes in 136t_4
---------------------------------
                               0

Drmedia in the Vault
--------------------
PC1005L1
PC1009L1
PC1012L1
PC1014L1
PC1023L1
PC1037L1
PC1039L1
PC1043L1
PC1045L1
PC1060L1
PC1073L1
PC1091L1
PC1095L1
PC1115L1
PC1121L1
PC1138L1
PC1139L1
PC1142L1
PC1143L1
PC1146L1
```

```
PC1210L1
PC1226L1
PC1232L1
PC1242L1
PC1307L1
PC1316L1
PC2002L2
PC2004L2
PC2006L2
PC2011L2
PC2016L2
PC2019L2
PC2021L2
PC2038L2
PC2041L2
PC2052L2
PC2101L2
PC2102L2
PC2103L2
PC2104L2
PC2113L2
PC2117L2
PC2120L2
PC2130L2
PC2145L2
PC2149L2
PC2157L2
PC2108L2

Drmedia to retrieve from vault
------------------------------
PC1058L1

Please checkout these database backups and take them to the vault
-----------------------------------------------------------------
PC2112L2

Please bring these Database backups back from the vault and check them in
-------------------------------------------------------------------------
PC2110L2

Library Name      Drive Name        Device Type      On-Line
-----------       ----------        -----------      -------------------
136T_3            3MT1.2.0.4        LTO              Yes
136T_3            3MT1.3.0.4        LTO              Yes
136T_3            3MT1.4.0.4        LTO              Yes
136T_3            3MT1.5.0.4        LTO              Yes
136T_4            4MT0.3.0.4        LTO              Yes
136T_4            4MT0.4.0.4        LTO              Yes
136T_4            4MT0.5.0.4        LTO              Yes
136T_4            4MT0.6.0.4        LTO              Yes
136T_4            4MT0.7.0.4        LTO              Yes
136T_4            4MT0.8.0.4        LTO              Yes
ANR8331I LTO volume PC2112L2 is mounted R/W in drive 4MT0.6.0.4 (mt0.6.0.4),
status: DISMOUNTING.
ANR8330I LTO volume PC1019L1 is mounted R/W in drive 3MT1.4.0.4 (mt1.4.0.4),
status: IN USE.
ANR8333I FILE volume P:\FILEPOOL1\00023FD9.BFS is mounted R/W, status: IN USE.
ANR8333I FILE volume W:\FILEPOOL1\00023EFB.BFS is mounted R/O, status: IN USE.
ANR8333I FILE volume R:\FILEPOOL1\00023FD3.BFS is mounted R/W, status: IN USE.
ANR8333I FILE volume W:\FILEPOOL1\00023FD8.BFS is mounted R/W, status: IN USE.
```

Note in the above example, tape(s) PC1058L1 is marked "To Retrieve from Vault". The tape(s) should be retrieved from offsite location for use as a scratch tape in this library.

Note in the above example, tape(s) PC2112L2 is marked "Checkout DB backup". The tape(s) should be removed from the library and taken to the Offsite Location on the next trip.

Note in the above example, tape(s) PC2110L2 is marked "Bring DB backups back". The tape(s) should be brought back from the Offsite Location and checked into the Library on the next trip.

Operator will remove and add DB tape(s) using the proper tape management system commands in "Tivoli".

All shifts within Operations track and log the tape movement and records it in the NetOps Functional/Operational Checklist commonly referred to as the Daily Ops Log. Each shift will record tape numbers removed from a specific system under the section called *Shift Tape Removal Log.*

Continuous Activities to be Monitored Hourly -

> **Insert & Remove LTO Tapes as required for scratch, vault and DBbackup purposes for Bimini, Guana, RealGar, Lithium.**

1ST Shift Tape Removal Log

BIMINI (DeathStar)	Lithium
1._____ 3._____ 5._____ 2._____ 4._____ 6._____	1._____ 3._____ 5._____ 2._____ 4._____ 6._____
GUANA (Devastator)	**RealGar (Quartz - T3 / T4)**
1._____ 3._____ 5._____ 2._____ 4._____ 6._____	1._____ 3._____ 5._____ 2._____ 4._____ 6._____

After logging tapes for offsite removal, the operator will place them in a defined area for verification prior to their removal to the offsite location.

The day shift operator(s) will perform the tape verification. This is to ensure that only tapes that are in "Vault Status" are moved offsite.

All Operations staff working all shifts is expected to know the Tape Exchange Process.

The 1st Shift Operations staff log has a sheet within it titled "*Offsite Transfer Tape Process*". All tapes from prior shifts are to be recorded here to show in-house or offsite movement of any and all backup cycle tapes. This is for accounting and audit purposes.

Offsite Transfer Tape Process

1.

3rd Shift Tapes to Move Offsite Dates: ___/___/___ thru ___/___/___		1st Shift Tapes to Move Offsite Dates: ___/___/___ thru ___/___/___		2nd Shift Tapes to Move Offsite Dates: ___/___/___ thru ___/___/___	
Deathstar / Devastator / RealGar / Lithium	Deathstar / Devastator / RealGar / Lithium	Deathstar / Devastator / RealGar / Lithium	Deathstar / Devastator / RealGar / Lithium	Deathstar / Devastator / RealGar / Lithium	Deathstar / Devastator / RealGar / Lithium
1. _____ 2. _____ 3. _____ 4. _____	1. _____ 2. _____ 3. _____ 4. _____	1. _____ 2. _____ 3. _____ 4. _____	1. _____ 2. _____ 3. _____ 4. _____	1. _____ 2. _____ 3. _____ 4. _____	1. _____ 2. _____ 3. _____ 4. _____

The Operations staff will use the 4 System Logs to determine if any tapes are to be returned from the offsite location and made available for active service.

The Operations staff shall use the protective rolling storage bags to transport tapes in order to keep any transferred media protected from weather, consolidated in one controlled space and secure.   Locks shall be used to prevent access by unauthorized persons.

Operations normal process requires the performance of a tape exchange once a day. However, several trips may be required as the need arises.

Upon returning with tapes, the operator will identify these tapes to the appropriate system library showing that they have returned by using proper instruction to make *Onsite Status*. This will make the tapes available to use as scratch tapes.

Upon completion of the Daily Tape Exchange, the operator will log in the OpsLog book that the process was completed successfully and/or completed with issues that are also identified in the logbook.

In the event that the returning scratch tapes are not needed for immediate usage, a location in the server room has been allocated to store them until needed.

The weekend and holiday staff coverage for Operations may require the operations staff to utilize the onsite Data Vault as a location to store tape media (Backups) in the event they are unable to travel to the offsite location.

Definitions

OCCS is the acronym for the official name of the Office of Computing and Communications Services.

Policy References	
ODU faculty, staff and students are bound by all applicable laws, policies, standards and procedures and guidelines. For reference, some frequently referenced documents are noted. This is a non-inclusive list and not intended to limit applicability of any other law or policy.	
℗ Policy Foundation:	Federal and State Law Policy 3507 Operations Management
⛭ Related Standards:	IT System and Data Backup and Restoration Standard Server Management Standard Network Management Standard Change Management Standard Print Management Standard Physical Security Standard
⧉ Related Procedures, Forms:	System Monitoring procedure Console Logging Procedure Customer Notification Procedures Alert Posting Procedure
ⓘ Related Guidelines:	System Monitoring Tips Call Out List Customer Contact List
⚒ Maintenance:	Office of Computing and Communications Services
✔ Effective Date:	Reviewed on an annual basis
✔ Approved by:	Rusty Waterfield Acting Assistant Vice President, Office of Computing and Communications Services