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VAX Storage Library System V2.1

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READ THIS FIRST

Dear VAX SLS Customer:

Enclosed is your distribution kit for the Version 2.1 VAX Storage Library System. This version of the VAX SLS software incorporates significant quality improvements over the V2.0 VAX SLS software. Please read the VAX Storage Library System Release Notes for a complete description of the changes included with this new version.

Attached to this cover letter is a description of two issues we would like to bring to your attention. Please read the enclosed descriptions carefully to determine if they apply to your site.

Thank you for using the VAX Storage Library System.

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Problem #1: A VMS MOUNT restriction may prevent VAX SLS software from write-enabling volumes it doesn't own

Problem Description:

A restriction has been found in the VMS MOUNT utility which may prevent the VAX SLS software from mounting volumes as write-enabled during a system backup. If the VAX SLS software cannot mount a volume write-enabled an OPCOM message similar to the following will appear:

```
%%%%%%%%%%% OPCOM 12-JUL-1991 13:53:44.00 %%%%%%%%%%%
Message from user SLS on MYNODE
Volume MTP001 on _MYNODE$MUA0: must be write enabled
```

The restriction is due to the way VMS MOUNT checks UIC protection for magnetic tape and cartridge volumes. Because VAX SLS V2.1 now writes volume protection and ownership information on volumes used for system backups this is a new problem for VAX SLS that did not occur with previous versions.

The circumstances under which this problem occurs are as follows:

1. Multiple standalone nodes or VAXcluster systems are performing system backups with VAX SLS V2.1.
2. The VAX SLS software account UICs are not uniform among these systems.
3. Volumes that had been used previously on one system or VAXcluster are later used for a system backup on a system with a different VAX SLS software account UIC.
4. The protection code written on the volumes specifies only READ access for users in the WORLD category. Note that the value of the PROTECTION symbol defined in the file SLS$SYSTEM:SYSBAK.TEMPLATE grants only READ access to users in the WORLD category as follows:

```
$! Reel / Saveset Protection Parameter
$!
$ PROTECTION :== S:RW,O:RW,G:R,W:R
$!
```

Therefore, system backup *_SBK.COM files that are created from SYSBAK.TEMPLATE may show the problem described in this section.

Problem Background:

VAX SLS V2.1 software was modified to write a protection mask onto the volumes it uses during a system backup. The owner UIC of these volumes is that of the VAX SLS software account. The value of this protection mask is taken from one of the following sources:

1. The PROTECTION symbol in the *_SBK.COM file in the SLS$SYSBAK directory, if it is not blank.
2. Otherwise, the default file protection set by the SET PROTECTION/DEFAULT command in the LOGIN.COM command procedure for the VAX SLS software account in the SLS$SYSTEM directory.

The writing of protection and ownership information ensures that nonprivileged users cannot access VAX SLS system backup volumes outside of VAX SLS without either permission from the owner of the volume or assistance from a privileged user such as the Storage Administrator.

The restriction with VMS MOUNT is that if a magnetic tape or cartridge volume is initialized with a protection mask which grants only READ access to users in the WORLD category, those users are restricted to read-only access regardless of process privileges or /OVERRIDE qualifiers on the MOUNT command.

The effect of this restriction is to prevent the VAX SLS software from mounting such volumes as write-enabled during a system backup unless the VAX SLS software account has a system UIC or a UIC identical to that of the OWNER of the volume.

Note that the problem does *NOT* appear if users in the WORLD category are given both READ and WRITE access or if users in the WORLD category are given no access at all. In these cases, the VAX SLS software will use VOLPRO privilege to mount the volume write-enabled even if the owner UIC of the volume differs from that of the VAX SLS software account. The problem also does not affect restore operations.

Guidelines for Avoiding the Problem:

The following steps should be taken to ensure that VAX SLS software will be able to mount as write-enabled all volumes that are used for system backups.

1. Assign all VAX SLS software accounts in your network a system UIC.

   A system UIC is one whose group number is less than the SYSGEN parameter MAXSYSGROUP. VMS MOUNT always grants users in the SYSTEM category READ and WRITE access to magnetic tape and cartridge volumes, regardless of what is specified in a volume's protection code. This solution avoids problems with all volumes that are initialized with volume protection.

2. IF it is not possible to assign all VAX SLS software accounts a system UIC, use the same UIC for all VAX SLS software accounts.

   This ensures that the VAX SLS software account on each node can write to system backup volumes previously written on other nodes. Volumes that are owned by users other than the VAX SLS software account may have to be re-initialized to eliminate the volume protection information before they can be used for system backups.

3. If you cannot comply with steps 1 or 2, then avoid specifying only READ access for WORLD users in your system backup procedures.

   The PROTECTION symbol in your *_SBK.COM files and the SET PROTECTION /DEFAULT command in the the file SLS$SYSTEM:LOGIN.COM define what protection is written onto the volume. Because of the restriction with VMS MOUNT, specify either READ and WRITE access for WORLD users (W:RW) or no access at all for WORLD users.

4. When users initialize their private volumes, they should avoid specifying only READ access for WORLD users with the /PROTECTION qualifier on BACKUP or INITIALIZE DCL commands or with VAX SLS user backups.

   Either specify both READ and WRITE access (W:RW), or no access at all for WORLD users.

Procedure To Modify The VAX SLS Software Account UIC:

The VAX SLS software account is assigned a UIC during product installation. If you want to change the VAX SLS software account without reinstalling the product follow this procedure.

1. Shut down VAX SLS software:

```
$ @SLS$SYSTEM:SLS$SHUTDOWN
```

2. Set default directory to the system directory:

```
$ SET DEFAULT SYS$SYSTEM
```

3. Execute the VMS AUTHORIZE utility to modify the SLS account:

```
$ MCR AUTHORIZE
UAF>MODIFY SLS/UIC=[system_uic]
```

4. Verify that the SLS identifier was correctly modified to reflect the new UIC and exit

```
UAF> SHOW/ID SLS
UAF> EXIT
```

5. Modify the UIC ownership of VAX SLS files:

```
$ SET FILE/OWNER=[SLS] SLS$ROOT:[...]*.*;*
$ SET FILE/OWNER=[SLS] <device>:[000000]SLS$FILES.DIR
```

6. Restart VAX SLS software:

```
$ @SYS$STARTUP:SLS$STARTUP
```

Problem #2: Problems with Terminating Backups

General Description:

A backup that is in progress can be terminated in the following ways:

1. by issuing a STOP/ID command on the backup process,
2. by issuing a STOP/ENTRY command on the backup batch job,
3. by replying "QUIT" to a VAX SLS OPCOM request,
4. by a system crash or process exit.

In general, terminating a system backup that is in progress may affect future system backups in two ways:

1. The volume being written may be left in a state that prevents additional data from being written to it;
2. For system backups, the file named in the CONTINUE symbol in the *_SBK.COM file for the backup job may be left in a state that prevents its use.

Effect of Backup Termination on Volumes:

When terminated by any method except responding "QUIT" to an OPCOM request, the VAX SLS backup image cannot write end-of-volume tape marks to the end of the volume to which it is writing. When this happens, any attempt to write another save set to the volume will result in the following error:

```
%BACKUP-F-CONTINUED, <save-set-name> contains a contin-
ued file - cannot append
```

Previously-written save sets on the volume may be read successfully for restore operations. But the volume must be re-initialized with the VMS DCL commands `INITIALIZE` or `BACKUP/REWIND` before new data can be written to it. Therefore, we strongly recommend that VAX SLS users avoid using the commands `STOP/ID` or `STOP/ENTRY` to terminate backup operations that are in progress.

Effect of Backup Termination on CONTINUE Files:

VAX SLS software provides the ability for syste backup jobs to write multiple save sets contiguously onto a single volume set. This feature is implemented through the CONTINUE symbol in your *_SBK.COM files. If the CONTINUE symbol is defined as a file name string, all save sets produced by system backups whose CONTINUE symbols are the same will write contiguously to a single volume or volume set.

The volume ID of last volume of the volume set is stored in a file whose name is constructed from the CONTINUE symbol value in the format: SLS$SYSBAK:<continue>.CONT_READY. While a backup is in progress, the file is renamed to SLS$SYSBAK:<continue>.CONT_INPROG to prevent another backup job from using the same volume set. If a system backup job finds the CONTINUE file with the file type .CONT_INPROG, it assumes that the volume set is in use by another job and proceeds with the backup by allocating and initializing a volume in the FREE state. These backup jobs will not update the CONTINUE file to allow future system backups to append save sets to the volume set used for the backup.

If you terminate a system backup job, the CONTINUE file's name keeps the file type .CONT_INPROG, thus preventing other system backups from using the CONTINUE file feature to store multiple save sets on a single volume or volume set. This results in wasted space on large capacity media.

Note: in a future maintenance release of VAX SLS software, the system backup procedure will correctly handle CONTINUE files when the job is terminated by the operator responding "QUIT" or "SKIP" to VAX SLS OPCOM requests.

Procedure to Handle CONTINUE Files after Termination of a System Backup:

The following is a procedure to recover from backup job termination problems with CONTINUE files:

1. Determine the value of the CONTINUE symbol for the system backup which was terminated.

   If the CONTINUE symbol is blank, then no further action is required.

   If the CONTINUE symbol has a string value, then substitute that string value (without the optional /NEW qualifier) for the <continue> fields in the following steps.

2. If the backup was terminated using the commands `STOP/ID` or `STOP/ENTRY` or by either a system crash or program error, use a new volume set in future backups.

   It is highly probable that the volume which was being written will cause %BACKUP-F-CONTINUE errors if you attempt again to write to it before it is re-initialized. To cause VAX SLS software to start using a new volume set, delete all versions of the the CONTINUE file using the following command.

```
$ DELETE SLS$SYSBAK:<continue>.CONT_INPROG;*
```

3. If the backup was terminated by replying "QUIT" to the first "REDO, SKIP or QUIT" prompt of a system backup job (or by replying "SKIP" to all such prompts), then you should rename the CONTINUE files.

   Renaming all versions of the CONTINUE file to the file type .CONT_READY allows VAX SLS software to append additional save sets to the volume or volume set with subsequent system backup jobs. Use the following command:

   ```
   $ RENAME SLS$SYSBAK:<continue>.CONT_INPROG;* -
     *.CONT_READY;*
   ```

   It is not an error if a .CONT_INPROG file does not exist. A new volume set will be started with the next execution of a system backup with the same CONTINUE symbol value.

4. If the backup was terminated by replying "QUIT" to a load request for the *first* volume then you must delete *only the highest version* of the CONTINUE file using the following command.

   The previous version of the CONTINUE file, if any, will contain the correct volume ID of the volume to be written:

   ```
   $ DELETE SLS$SYSBAK:<continue>.CONT_READY;0
   ```

   If there is no previous version of the CONTINUE file, then VAX SLS will start a new volume set the next time it executes a system backup job with the same CONTINUE symbol value.