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NONSYSTEM VOLUME SETS
AND
THE MIGRATION OF PRIVATE VOLUMES
TO AN S900 HP 3000

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NONSYSTEM VOLUME SETS
AND
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INTRODUCTION

This Application Note discusses the use of the 900 Series HP3000 nonsystem volume sets as they relate to the classic HP3000 private volumes. It will explain the necessary procedures to successfully create nonsystem volume sets and migrate private volumes from the classic to the S900.

Throughout this Application Note, a nonsystem volume set will be referred to as an NVS and a private volume as a PV. The term 'MPE XL' will be used when referencing the S900 precision architecture operating system and the term 'MPE V' will be used when referencing the classic HP3000 operating system. The Application Note was written for the user who primarily wishes to gain an understanding of NVSs and/or gain an understanding of the migration process of PVs to a S900 system. For the migration of PVs it is assumed the reader has a prior familiarization with PVs. A review of HP 3000 Application Note #24 may be helpful for those who wish to learn about the migration process but do not have a background in PVs. All system configuration changes suggested in this Application Note must be made in accordance with hardware support contracts between the customer and HP. Furthermore, it is assumed the reader already understands the advantages and disadvantages of using PVs and has determined the advantages outweigh the disadvantages.

An overview of volume sets it presented first, followed by a discussion of the creation of nonsystem volume sets. A PV migration philosophy is then presented. Lastly, examples which show the creation and migration processes will be given.

OVERVIEW OF VOLUME SETS ON THE S900 SYSTEM

Definition

A volume set is simply a disc pack or a set of disc packs that physically contain logically related data. For example, a particular application such as a payroll system is a group of logically related files. Those files could physically reside on a specific disc pack or set of disc packs.

Volume sets provide the system manager with an easy and efficient way to partition and allocate storage space. Volume sets are the functional equivalent of PVs on MPE V systems but are less complex and easier to use.

A volume set consists of 1 to 255 disc packs and may optionally contain 1 to 255 volume classes. Each volume set must have a name which may be up to 32 characters (alphanumeric, underbar and/or a period). A maximum of 24 volumes sets can be mounted on a system at one time.

MPE XL supports two types of volume sets: system volume sets and nonsystem volume sets. Both are referred to as 'volume sets' however, as stated earlier, this Application Note is primarily concerned with the latter. These two terms are equivalent to system domain and nonsystem domain on an MPE V system, respectively. They are equivalent in function but not in the way they are defined and handled by MPE XL. Unlike PVs the volume set definition exists on the set itself, not on the system volume set.

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There is only one system volume set per S900 system and by default is named MPEXL_SYSTEM_VOLUME_SET. This volume set contains the MPE XL operating system, the system image, configuration, and the various files necessary to run the system.

There may be multiple NVSs per MPE XL system just as there may multiple PVs per MPE V system. The NVSs inherently posses the same advantages as PVs such as increased overall system availability and disadvantages such as additional account structure maintenance. See Application Note #24 for details. However, unlike PVs, access time for NVSs are comparable to system volume sets. Therefore no system performance degradation occurs when employing the use of NVSs as there is with PVs on MPE V.

Each volume in a volume set is classified into one of five statuses. Any disc pack mounted on a S900 system will be classified as one of these statuses.

- MASTER: Is a disc pack that contains volume set information, a directory root and user files. The master for the system volume set must be located on LDEV 1. A master may have from 0 to 254 members giving a possible total of 255 volumes per volume set.

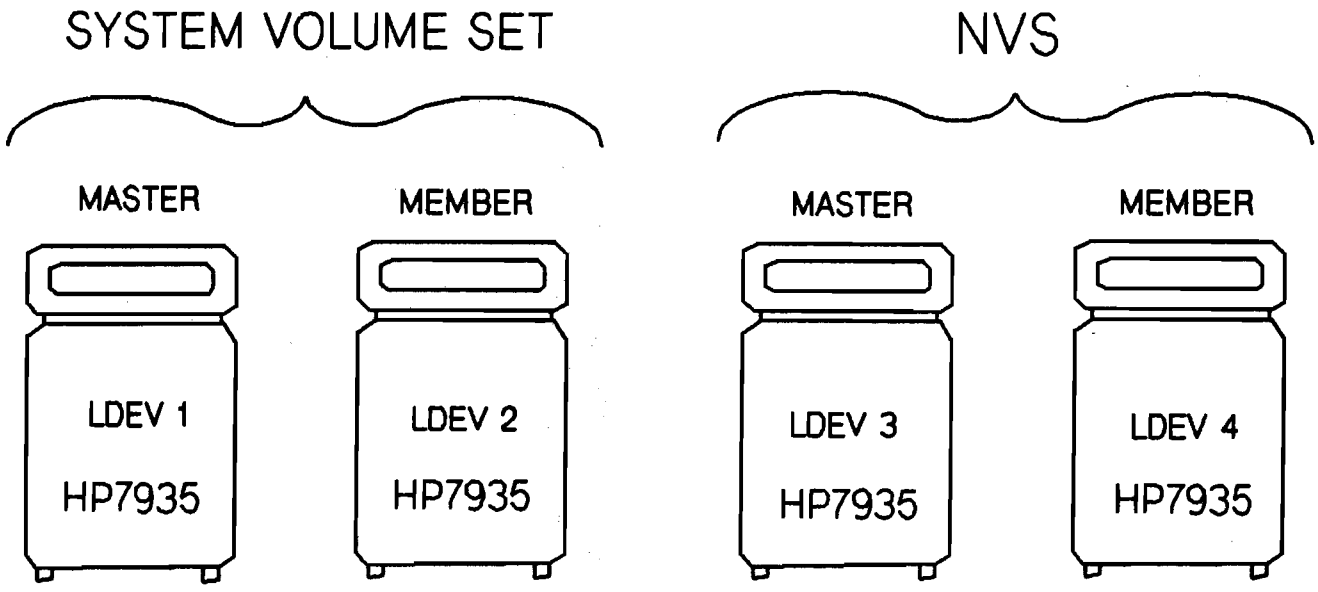
- MEMBER: Is a disc pack that is a logical part of a volume set to which a master is defined. Contains user files. Its master must be mounted for a disc pack defined a member to be accessible.

- LONER: Is a member without a mounted master. The files on the disc pack are inaccessible until the master is mounted.

- SCRATCH: The pack is currently not being used. It may become a member or a master of a particular NVS.

- UNKNOWN: A pack that is not recognized by MPE XL. An PV that is mounted on a S900 system will be placed in the unknown state and any files that may be on the pack will NOT be accessible.

An example of volume sets is given below. In this example there are two volume sets, a system volume set and an NVS. Each has two volumes in the set. All system related files would reside in the system volume set on LDEVs 1 and 2. All or some user files could be placed in the NVS on LDEVs 3 and 4.



As stated earlier, a volume set may optionally contain 1 to 255 volume classes. A volume class is a subset of a volume set. It is used to further partition and allocate disc storage space within the NVSs. For example, certain files may be placed in an NVS to separate them from other files. Volume class names may be assigned to specific volumes to separate those files further. All volume sets must contain the class name DISC for certain Compatibility Mode (CM) programs and utilities to function.

In order to partition disc storage space into NVSs, they must be created and made available for use. The account structure must then be built and the user files must be loaded.

CREATION

Volume sets are created using the system management utility VOLUTIL which is the functional equivalent of VINIT on MPE V. VOLUTIL may be run by any interactive user on the system, however, varying degrees of capabilities are required for certain commands. Basically, any user with SM and CV capabilities may execute any VOLUTIL command. Consult the *Volume Management Reference Manual*, (Hewlett-Packard p/n 32650-90045) for the specific capabilities required for each command.

In order to designate a volume as its own or a part of a volume set it must be initialized in much the same way as PVs. Be sure the volume(s) to be made into or a part of a set are currently in the SCRATCH or UNKNOWN state. The DSTAT command may be used to determine what state a particular volume is in. For example,

```
:DSTAT ALL
  LDEV-TYPE     STATUS       VOLUME (VOLUME SET - GEN)
 -----------   ---------    --------------------------
  1-079370      MASTER       MEMBER1    (MPEXL_SYSTEM_VOLUME_SET-0)
  2-079370      MEMBER       MEMBER2    (MPEXL_SYSTEM_VOLUME_SET-0)
 80-079370      MASTER       MEMBER1    (USERSET1-0)
 81-079370      MEMBER       MEMBER2    (USERSET1-0)
 82-079370      SCRATCH
 83-079370      UNKNOWN
```

In the example above, LDEVs 1 and 2 are a part of the system volume set. LDEVs 80 and 81 are already a part of an NVS called USERSET1. LDEVs 82 and 83 are available for initialization as volume sets. To make them a part of a volume set called USERSET2 one of the volumes would have to be designated as the master and the other as a member. The following commands within VOLUTIL would be executed.

```
:VOLUTIL
Volume Utility A.01.01, (C) Hewlett-Packard Co., 1987.
volutil: NEWSET SNAME=USERSET2 MASTER=MEMBER1 LDEV=82

*Verify: Initialize new volume set USERSET2:MEMBER1 on ldev 82
[Y/N]? Y

*Note: New master volume has been initialized on ldev 82.

volutil: NEWVOL USERSET2:MEMBER2 LDEV=83

*Verify: Initialize new volume set USERSET2:MEMBER2 on ldev 83
[Y/N]? Y

*Note: New member volume has been initialized on ldev 83.

volutil: :DSTAT ALL
  LDEV-TYPE     STATUS       VOLUME (VOLUME SET - GEN)
 -----------   ---------    --------------------------
  1-079370      MASTER       MEMBER1    (MPEXL_SYSTEM_VOLUME_SET-0)
  2-079370      MEMBER       MEMBER2    (MPEXL_SYSTEM_VOLUME_SET-0)
 80-079370      MASTER       MEMBER1    (USERSET1-0)
 81-079370      MEMBER       MEMBER2    (USERSET1-0)
 82-079370      MASTER       MEMBER1    (USERSET2-0)
 83-079370      MEMBER       MEMBER2    (USERSET2-0)

volutil: EXIT
```

The NEWSET command is used to create a new volume set and its associated master volume. The NEWVOL command is used to create and initialize a new member volume. The NEWSET must be completed first and the resulting master volume must be mounted. There are several additional parameters with each command. The defaults were used here for simplicity. Consult the, *Volume Management Reference Manual* (Hewlett-Packard p/n 32650-90045) for details.

It is important to understand that the ldev parameter on both the NEWSET and NEWVOL commands is simply letting the system know which drive the volume happens to be on for the initialization. Just as with PVs, they may be moved from drive to drive (providing they are removable disc packs). Also just as with VINIT on MPE V, when answering Y to the initialization prompt, all data that may have been on the drive is lost. Be careful not to initialize any packs you need to keep, such as one of the system volumes!

AVAILABILITY

With MPE XL there is no longer a need for the console operator to explicitly mount a volume or volume set. Instead, MPE XL has Automatic Volume Recognition (AVR) which recognizes a volume as it is spun up. The system automatically mounts it and copies pertinent volume set information from it into a system table.

There are, however, a few commands the console operator still needs to take care of in order to manage the use of NVSs. These commands are described below in alphabetical order.

COMMAND	DESCRIPTION
DSTAT	Displays the status of all volumes mounted.
VMOUNT	Enables and disables user access to volume sets. Access can be enabled on a user-by-user basis or automatically to all users.
VSCLOSE	Notifies the system that there is a close pending on a volume set in preparation for removing that volume set from the system. It is important to note the system volume set cannot be closed. Also, once a set is closed it is placed in a LOANER state. This command replaces the DOWN command on MPE V.
VSRELEASE	Cancels a previously issued VSRESERVE. This command is roughly equivalent to the DISMOUNT command on MPE V.
VSRELEASESYS	Cancels a previously issued VSRESERVESYS. This command is roughly equivalent to the LDISMOUNT command.
VSRESERVE	Reserves a specific volume set for the user and ensures it is not taken offline by the operator for duration of the session. In other words, it marks the set as 'in use' by a particular session to prevent a closing of the set until a VSRELEASE is completed. This command is equivalent to the MOUNT command on MPE V.
VSRESERVESYS	Reserves a volume set at the system level. This command is roughly equivalent to the LMOUNT command on MPE V.
VSOPEN	Cancels a previously issued VSCLOSE command. This command replaces the UP command on MPE V.
VSUSER	Displays all users accessing a particular volume set that has already been enabled for access.

In order to manage the NVSs the first command needed to be understood is the VMOUNT command. As stated above, this command enables and disables access to the volume management facility. In most instances it would be set up so access is automatically available to any user, providing they have the log on to the NVS. Automatic availability is initiated with the following console command.

:VMOUNT ON,AUTO

This is the system default. It is not necessary to explicitly type this command. In this case, any volume set would be available to any user who attempts to log onto an account residing on an NVS. If a user-by-user basis is desired, then the following command would be used

:VMOUNT ON

It could be placed in an OPTION LOGON UDC or in a startup file. The difference is a mount request will appear on the console for the first access by each user and the user will wait for a reply from the

operator. For example, if a user attempted to log onto an account on the USERSET1 NVS the following would display on the console

```
?hh:mm/S#nn/nn/ACCESS TO USERSET1 BY USER.ACCOUNT (Y/N) (MAX CHARS.=1)
=REPLY nn,Y
```

The operator would reply to the PIN when access is allowed. The user's session would not be placed in the EXEC state until the reply had been given.

ACCOUNT STRUCTURE

Just as with a PV, an NVS account directory structure is kept in parallel on both the system volume set and the NVS. To keep them in parallel some structure commands (NEWACCT, NEWGROUP, etc) will need to be issued twice, once for the system directory and once for the volume set directory.

Accounts

To build a new account on a volume set, two NEWACCT commands need to be issued. As stated previously, one is for the system directory and the other is for the volume set. For example, if the system manager wants to create the PAYROLL account on the USERSET2 NVS, the following two commands would have to be issued.

```
:NEWACCT PAYROLL,MANAGER;CAP=AM,AL,GL,UV,ND,SF,IA,BA,PH,DS,MR
:NEWACCT PAYROLL,MANAGER;ONVS=USERSET2;FILES=10000
```

The first command places the structure on the system volume set. All defaults were used except for the account capabilities which were specified with the CAP parameter. The second command places the structure on the NVS called USERSET2. It is important to understand that all parameter definitions except for the FILES parameter are placed on the system volume set. In this example all defaults were used except for the capabilities. The capabilities parameter was only needed on the first command since the CAP parameter is not kept on the NVS. The ONVS parameter on the second command is used to specify which NVS to place the account structure.

In order to purge an account, two PURGEACCT commands are required. For example, if the system manager wanted to purge the PAYROLL account just created the following commands would be issued.

```
:PURGEACCT PAYROLL;ONVS=USERSET2
 ACCOUNT PAYROLL TO BE PURGED (Y/N)? Y

:PURGEACCT PAYROLL
 ACCOUNT PAYROLL TO BE PURGED (Y/N)? Y
```

Unlike the NEWACCT and PURGEACCT commands, only one ALTACCT command would be required if a modification was necessary. If any parameter other than FILES needed be be changed, the command would be issued without the ONVS parameter. On the other hand, if the FILES parameter needed to be changed, the command would be issued with the ONVS command. Only if both the FILES parameter and another parameter needed to be changed would two ALTACCT commands be necessary.

Groups

To build a new group on an NVS, first the account needs to be placed on both the system volume set and the NVS. Two commands are also necessary to build and purge groups. For example, to build the DATA

group in the PAYROLL account on the USERSET2 NVS, the system manager would place the account on the NVS appropriately and either the system manager or the account manager would issue the following two commands.

```
:NEWGROUP DATA.PAYROLL;HOMEVS=USERSET2

:NEWGROUP DATA.PAYROLL;ONVS=USERSET2
```

The first command places the group on the system volume set. The HOMEVS parameter specifies where the files in the group will be built. Note there is no HOMEVS parameter on the NEWACCT command as it is only necessary on the NEWGROUP command. The second command places the group on the NVS. To purge a group, two PURGEGROUP commands would be needed. To purge the group created above the following commands would be issued.

```
:PURGEGROUP DATA.PAYROLL;ONVS=USERSET2

:PURGEGROUP DATA.PAYROLL
```

The HOMEVS parameter is not needed to purge the group from the system volume set.

Users

All users are created just as they are on MPE V systems. There is no need to specify a volume set as user information is not kept on the NVS.

MIGRATION

The migration of PVs may be done in one of two ways. It may be done manually as described in this section or by using DIRMIG. DIRMIG is a modularized menu driven program that builds an XL system from an MPE V SYSDUMP tape. It basically reproduces the appropriate commands that will be discussed below making the migration easier on the user. The manual steps are described in this paper to give the user an understanding of what is involved with the migration of PVs.

The PV migration process is basically the same as the migration of user files. The only difference is where the files get placed and how they get there. Just as with other files, PV files must also be stored from the MPE V system and restored onto the S900 system. This is because PV disc packs from a classic system are unreadable when mounted on a S900 system (see volume set status UNKNOWN above). The steps necessary to successfully migrate a PV to an NVS are outlined below.

- **On the MPE V:**
- Store all files pertaining to the PV set to tape.
- Print a hard copy listing of the account structure on the PV.
- Purge all references to the PV from the system.
- Reconfigure the system appropriately (that is, disc drives taken off).

The reconfiguration of the system is the only step that would require exclusive access by the system manager. All other steps could be done when general users are accessing the system. Only those users accessing the PV must remain off the system during the migration.

To start the migration process a store of all files pertaining to the PV must be taken. The store file subset would include:

```
:FILE TAPE DEV=TAPE

:STORE @.@.ACCT1,@.@.ACCT2;*TAPE;SHOW
```

In the example above ACCT1 and ACCT2 represent all accounts on the PV that are to be migrated to the S900.

A hardcopy listing of the account structure would be necessary in order to rebuild it on the S900. This would be done in LISTDIR5.PUB.SYS redirecting the output to the line printer. For example:

```
:FILE LP;DEV=LP
:RUN LISTDIR5.PUB.SYS

LISTDIR5 G.03.00 (C) HEWLETT-PACKARD CO., 1983
TYPE 'HELP' FOR AID
>LISTACCT ACCT1,*LP;PASS
>LISTGROUP @.ACCT1,*LP;PASS
>LISTUSER @.ACCT1;PASS
>LISTACCT ACCT2,*LP;PASS
>LISTGROUP @.ACCT2,*LP;PASS
>LISTUSER @.ACCT2,*LP;PASS
>EXIT
```

Once the store and the hardcopy listing of the PV is taken, there is no longer a need to keep the PV on the classic system. All references to the PV would then be purged as follows:

```
:PURGEACCT ACCT1

:PURGEACCT ACCT2

:PURGEVSET VSETNAME
```

All accounts associated with the PV would be purged using the PURGEACCT command. There is no need to purge it from the PV disc as that disc and the data on it will be erased and reinitialized on the S900. The PURGEVSET command simply removes the system reference to the PV.

The last step is to reconfigure the system as necessary. If disc drives are removed from the system (to be placed on the S900), the I/O configuration must then be changed accordingly.

At this point the PV no longer exists, however, all data pertaining to the PV is on tape ready to be migrated to the S900.

- **On the S900:**
- Reconfigure the system appropriately (that is, disc drives added).
- Create the NVS.
- Create the account structure on the NVS as it existed on the PV on the classic.
- Restore user files.

Configuration changes must be made first in order to accommodate any new disc drives to be added to the system. Just as with the classic system, this is the only step that would require exclusive access by the system manager. Only the future NVS users must remain off the system during the remaining steps.

After the disc drives are in place, the new NVS must be created using the system management utility VOLUTIL as discussed above. The disc drives would be initialized and an appropriate volume name placed in the volume label.

The accounting structure is then duplicated from the classic system. Using the hardcopy listing of the account structure, the system manager would manually issue the NEWACCT, NEWGROUP, and NEWUSER commands with respect the NVS's on a S900 as discussed above.

To complete the migration process the user files would be restored to the S900. The files would be restored with the ;TRANSPORT parameter and placed on the appropriate NVS. For example, to restore all files stored from the classic system and place them on the NVS called USERSET2 the following commands would be issued (assuming the account structure was built on USERSET2).

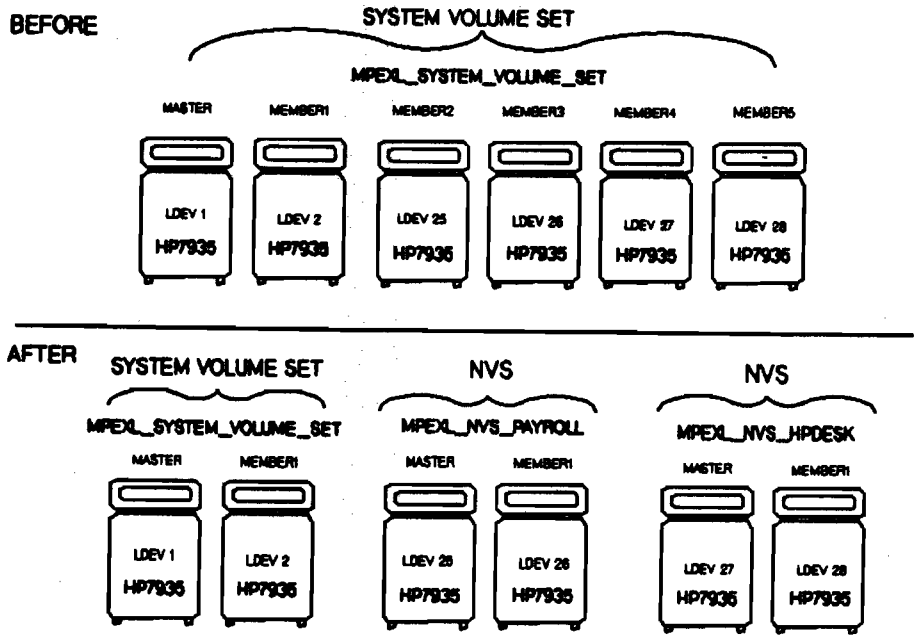
```
:FILE TAPE;DEV=TAPE

:RESTORE *TAPE;@.@.@;SHOW;TRANSPORT;VOLSET=USERSET2
```

EXAMPLES

In order to understand NVS's the following two examples are given. The first example shows how to logically break down an existing S900 HP3000 with only a system volume set into multiple volume sets. The second example shows how to successfully migrate a classic HP3000 PV to a S900 HP3000.

Example 1

Assume a S900 HP3000 currently contains six 7935 disc drives all a part of the MPEXL_SYSTEM_VOLUME_SET. That is to say all disc drives are on the system volume set and there is no use of nonsystem volume sets. Further assume the system runs two major applications. For argument's sake assume the applications are payroll and HPDesk. For simplicity assume each part uses the same amount of disc space. In most cases this assumption would be unrealistic. The system manager would have to determine how much disc space each application would require and then determine how many disc drives should be allocated to each part. For our example, the system manager wishes to logically break down the system into three equal parts. One part for the system, one part for payroll and one part for HPDesk. The following diagram depicts what the system looks like before the creation of the NVS's and the desired outcome after the NVS's are created.



The steps for the system manager to take are:

- Print a hardcopy listing of structure for each account, group and user to be placed on an NVS.
- A complete back up of the ENTIRE system, including the system directory. These tapes will be used for a RELOAD therefore it is imperative all files are properly stored. Two separate stores will be necessary.
- First SYSGEN should be used to create a system load tape. See the *System Backup and Recovery Manual* Hewlett-Packard p/n 32650-60025 for details.
- Next a complete backup of user and system files and the file system directory using the STORE program. Also see the *System Backup and Recovery Manual* for details.
- Install system configuration.
- Make four of the six drives into two nonsystem volume sets. Two of the already six MPEXL_SYSTEM_VOLUME_SETS will remain as such. The other four will be broken down into two NVS's (two drives each), one called MPEXL_NVS_PAYROLL and the other MPEXL_NVS_HPDESK.
- Install system related files including the directory onto the system volume set.
- Create the account structure on the new NVS's.
- Restore the application files onto the appropriate VS.

The first step is to obtain listing of all the groups in each account to be placed on an NVS. In this example, a LISTxxxxx would be required for the PAYROLL and HPOFFICE accounts. These listings will be used later when creating the accounting structure on the NVS.

```
:FILE LP;DEV=LP
:LISTACCT PAYROLL,*LP
:LISTUSER @.PAYROLL,*LP
:LISTGROUP @.PAYROLL,*LP
:LISTACCT HPOFFICE,*LP
:LISTUSER @.HPOFFICE,*LP
:LISTGROUP @.HPOFFICE,*LP
```

The next step is self explanatory. The system manager simply needs to back up the system ensuring all files are properly stored. Two complete back ups might be a good idea.

The next step is to reload the system configuration. The steps necessary are as follows:

- Install the system load tape created above.
- Start the system.

After the system configuration is reloaded, only the system master volume on ldev 1 is initialized. The other volumes must be initialized using VOLUTIL. This is where the nonsystem volume sets are created. The disc drives are initialized as follows:

```
:VOLUTIL

Volume Utility A.01.01, (C) Hewlett-Packard Co., 1987.
volutil: :DSTAT ALL

  LDEV-TYPE     STATUS       VOLUME (VOLUME SET - GEN)
 -----------  ---------   --------------------------
  1-079350     MASTER      MEMBER1   (MPEXL_SYSTEM_VOLUME_SET-0)
  2-079350     SCRATCH               (MPEXL_SYSTEM_VOLUME_SET-0)
 25-079350     SCRATCH               (MPEXL_SYSTEM_VOLUME_SET-0)
 26-079350     SCRATCH               (MPEXL_SYSTEM_VOLUME_SET-0)
 27-079350     SCRATCH               (MPEXL_SYSTEM_VOLUME_SET-0)
 28-079350     SCRATCH               (MPEXL_SYSTEM_VOLUME_SET-0)

volutil: NEWVOL MPEXL_SYSTEM_VOLUME_SET:MEMBER2 LDEV 2

*Verify: Initialize new volume set MPEXL_SYSTEM_VOLUME_SET:
MEMBER2 on ldev 2 [Y/N] Y

*Note: New member volume has been initialized on ldev 2.

volutil: NEWSET SNAME=MPEXL_NVS_PAYROLL MASTER=MEMBER1 LDEV 25

*Verify: Initialize new volume set MPEXL_NVS_PAYROLL:MEMBER1 on
ldev 25 [Y/N]? Y

*Note: New master volume has been initialized on ldev 25.

volutil: NEWVOL MPEXL_NVS_PAYROLL:MEMBER2 LDEV 26
```

```
*Verify: Initialize new volume set MPEXL_NVS_PAYROLL:MEMBER2 on
ldev 26 [Y/N]? Y

*Note: New member volume has been initialized on ldev 26.

volutil: NEWSET SNAME=MPEXL_NVS_HPDESK MASTER=MEMBER1 LDEV 27

*Verify: Initialize new volume set MPEXL_NVS_HPDESK:MEMBER1 on
ldev 27 [Y/N]? Y

*Note: New master volume has been initialized on ldev 27.

volutil: NEWVOL MPEXL_NVS_HPDESK:MEMBER2 LDEV 28

*Verify: Initialize new volume set MPEXL_NVS_HPDESK:MEMBER2 on
ldev 28 [Y/N]? Y

*Note: New member volume has been initialized on ldev 28.

volutil: :DSTAT ALL

  LDEV-TYPE     STATUS       VOLUME (VOLUME SET - GEN)
 -----------  ---------   --------------------------
  1-079350     MASTER      MEMBER1   (MPEXL_SYSTEM_VOLUME_SET-0)
  2-079350     MEMBER      MEMBER2   (MPEXL_SYSTEM_VOLUME_SET-0)
 25-079350     MASTER      MEMBER1   (MPEXL_NVS_PAYROLL-0)
 26-079350     MEMBER      MEMBER2   (MPEXL_NVS_PAYROLL-0)
 27-079350     MASTER      MEMBER1   (MPEXL_NVS_HPDESK-0)
 28-079350     MEMBER      MEMBER2   (MPEXL_NVS_HPDESK-0)

volutil: EXIT

:FILE TAPE;DEV=TAPE
:RESTORE *TAPE;@.@.@-@.@.PAYROLL-@.@.HPOFFICE;SHOW;DIRECTORY
```

The next step in the process is to place the appropriate accounting structure on the NVS. In this example, the PAYROLL account and HPOFFICE account need to be placed on their volume sets.

```
:NEWACCT PAYROLL,MANAGER;ONVS=MPEXL_NVS_PAYROLL
:ALTGROUP xxxxxx.PAYROLL;HOMEVS=MPEXL_NVS_PAYROLL
:NEWGROUP xxxxxx.PAYROLL;ONVS=MPEXL_NVS_PAYROLL

:NEWACCT HPOFFICE,MGR;ONVS=MPEXL_NVS_HPDESK
:ALTGROUP xxxxxx.HPOFFICE;HOMEVS=MPEXL_NVS_HPDESK
:NEWGROUP xxxxxx.HPOFFICE;ONVS=MPEXL_NVS_HPDESK
```

Notice only one NEWACCT command was needed to place the accounting structure on the NVS. This is because the accounts already existed on the system volume set. They simply needed to be moved to the NVS. If these were actually new accounts, two NEWACCT commands would be required (one for the system directory and one for the NVS directory).

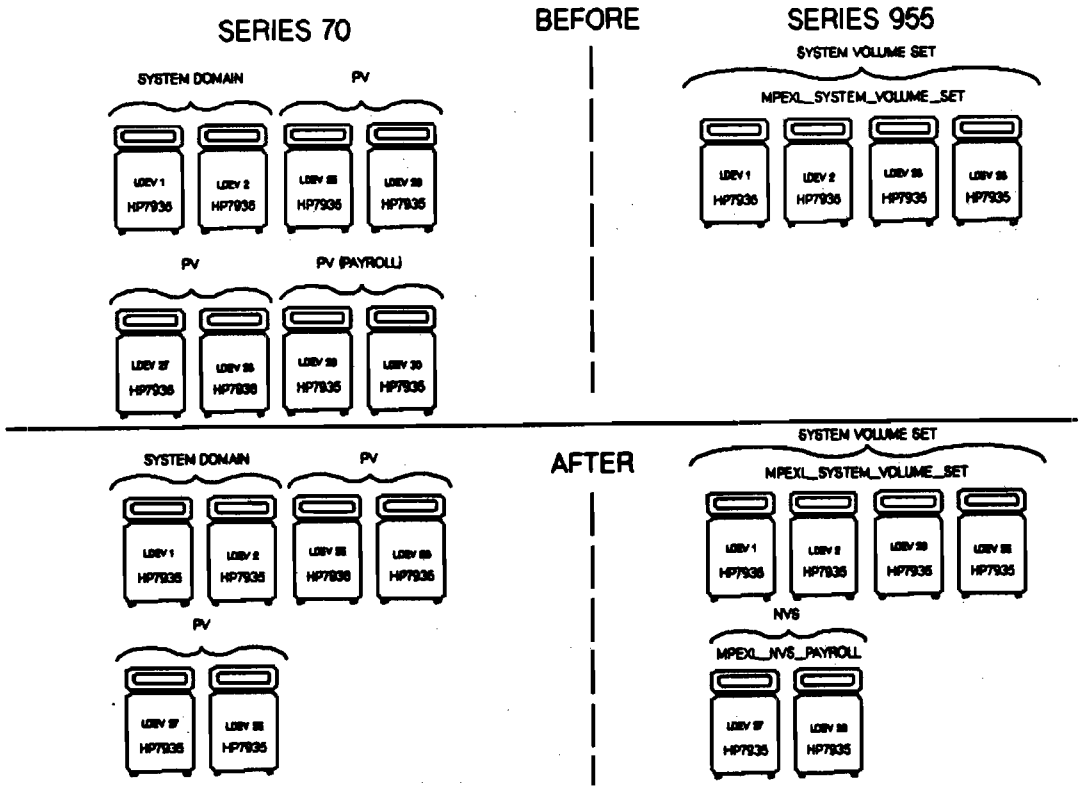
Two xxxGROUP commands would be issued for each group in the account(s). Refer to the LISTGROUP listing made in the first step. In this example the group already exists in the system directory but the system needs to know on to which NVS the files are to be placed. The ALTGROUP command does this. The NEWGROUP command then places the structure on the NVS.

To complete the process an MPE RESTORE is then done. Refer to the Storing and Restoring Files Manual (Hewlett-Packard p/n 32650-60025) for details.

```
:FILE TAPE;DEV=TAPE
:RESTORE *TAPE;@.@.PAYROLL;VOLSET=MPEXL_NVS_PAYROLL;SHOW
:RESTORE *TAPE;@.@.HPOFFICE;VOLSET=MPEXL_NVS_HPDESK;SHOW
```

Example 2

This is an example of how to migrate PV's from a classic HP3000 to NVS's on a S900 HP3000. Assume a system manager has two systems a S70 and a S955. The S70 contains several PV sets. The system manager wishes to move one set containing two disc drives from the S70 to the S955 as an NVS. The PV application to be migrated is payroll. It resides on two 7935 disc drives in the account called PAYROLL. The disc drives will be moved to the S955 and a new NVS will be created called MPEXL_NVS_PAYROLL. The following diagram illustrates what the systems look like before the migration and the desired out come after.



As stated in the migration section, there are several steps the system manager needs to complete on both the S70 and S955.

On the classic system:

All files associated with the PV are stored to tape. In this example, the file set would be:

```
:FILE TAPE;DEV=TAPE
:STORE @.@.PAYROLL;*TAPE;SHOW
```

A hardcopy listing of the complete accounting structure as it exists on the classic is needed for rebuilding the account on the S955. LISTDIR5 should be used to get all aspects of the account printed to the line printer.

```
:FILE LP;DEV=LP
:RUN LISTDIR5.PUB.SYS
>LISTACCT PAYROLL,*LP;PASS
>LISTGROUP @.PAYROLL,*LP;PASS
>LISTUSER @.PAYROLL,*LP;PASS
```

All references to the private volume are purged. The following command must be performed by the user who created the PV logged onto the group and account in which the original NEWVSET command was issued.

```
:PURGEVSET PAYROLL
```

The PAYROLL account is then purged. There is no need to purge the account from the disc drive as they will be placed on the S955 and reinitialized.

```
:PURGEACCT PAYROLL
```

The classic system is then reconfigured to remove the two disc drives. Consult the System Supervisor's Manual for details.

On the S955 system:

The system is first reconfigured for the additional two disc drives. Consult the System Supervisor's Manual for details. After the configuration is complete the two new disc drives must be initialized as a part of an NVS.

```
:VOLUTIL
Volume Utility A.01.01, (C) Hewlett-Packard Co., 1987.
volutil: :DSTAT ALL

  LDEV-TYPE     STATUS       VOLUME (VOLUME SET - GEN)
 -----------  ---------    --------------------------
  1-079350     MASTER       MEMBER1    (MPEXL_SYSTEM_VOLUME_SET-0)
  2-079350     MEMBER       MEMBER2    (MPEXL_SYSTEM_VOLUME_SET-0)
 25-079350     MEMBER       MEMBER3    (MPEXL_SYSTEM_VOLUME_SET-0)
 26-079350     MEMBER       MEMBER4    (MPEXL_SYSTEM_VOLUME_SET-0)
 27-079350     UNKNOWN
 28-079350     UNKNOWN

volutil: NEWSET MPEXL_NVS_PAYROLL MASTER=MEMBER1 LDEV 27

*Verify: Initialize new volume set MPEXL_NVS_PAYROLL:MEMBER1 on
ldev 27 [Y/N]? Y
```

```
*Note: New master volume has been initialized on ldev 27.
volutil: NEWVOL MPEXL_NVS_PAYROLL:MEMBER2 LDEV 28

*Verify: Initialize new volume set MPEXL_NVS_PAYROLL:MEMBER2 on
ldev 28 [Y/N]? Y

*Note: New member volume has been initialized on ldev 28.
volutil: :DSTAT ALL

 LDEV-TYPE    STATUS      VOLUME (VOLUME SET - GEN)
-----------  ---------   --------------------------
 1-079350     MASTER      MEMBER1   (MPEXL_SYSTEM_VOLUME_SET-0)
 2-079350     MEMBER      MEMBER2   (MPEXL_SYSTEM_VOLUME_SET-0)
25-079350     MEMBER      MEMBER3   (MPEXL_SYSTEM_VOLUME_SET-0)
26-079350     MEMBER      MEMBER4   (MPEXL_SYSTEM_VOLUME_SET-0)
27-079350     MASTER      MEMBER1   (MPEXL_NVS_PAYROLL-0)
28-079350     MEMBER      MEMBER2   (MPEXL_NVS_PAYROLL-0)

volutil: EXIT
```

The accounting structure is then rebuilt. The hardcopy listing from LISTDIR5 on the MPE V System is used.

```
:NEWACCT PAYROLL
:NEWACCT PAYROLL;ONVS=MPEXL_NVS_PAYROLL
:NEWGROUP xxxxxx.PAYROLL;HOMEVS=MPEXL_NVS_PAYROLL
:NEWGROUP xxxxxx.PAYROLL;ONVS=MPEXL_NVS_PAYROLL
:NEWUSER MGR.PAYROLL;HOME=xxxxxx
```

All account, group and user attributes would be added appropriately. Consult the Account Structure and Security Manual for details.

The last step in the process is to restore the files stored from the S70.

```
:FILE TAPE;DEV=TAPE
:RESTORE *TAPE;@.@.PAYROLL;VOLSET=MPEXL_NVS_PAYROLL;&
:TRANSPORT;SHOW
```

At this point the payroll application would be in Compatibility Mode. Further migration to Native Mode would be completed as any other CM file. For example, program files would be recompiled, all necessary data files would be realigned on 32 bit boundaries, etc. Refer to the Migration guide (Hewlett-Packard p/n 30367-60003) for details on particular languages.

BACK ISSUE INFORMATION

Following is a list of the Application Notes published to date. If you would like to order single copies of back issues please use the *Reader Comment Sheet* attached and indicate the number(s) of the note(s) you need.

Note #	*Published*	*Topic*
1	2/21/85	*Printer Configuration Guide (superseded by note #4)*
2	10/15/85	*Terminal types for HP 3000 HPIB Computers (superseded by note #13)*
3	4/01/86	*Plotter Configuration Guide*
4	4/15/86	*Printer Configuration Guide - Revised*
5	5/01/86	*MPE System Logfile Record Formats*
6	5/15/86	*Stack Operation*
7	6/01/86	*COBOL II/3000 Programs: Tracing Illegal Data*
8	6/15/86	*KSAM Topics: COBOL's Index I/O; File Data Integrity*
9	7/01/86	*Port Failures, Terminal Hangs, TERMDSM*
10	7/15/86	*Serial Printers - Configuration, Cabling, Muxes*
11	8/01/86	*System Configuration or System Table Related Errors*
12	8/15/86	*Pascal/3000 - Using Dynamic Variables*
13	9/01/86	*Terminal Types for HP 3000 HPIB Computers - Revised*
14	9/15/86	*Laser Printers - A Software and Hardware Overview*
15	10/01/86	*FORTRAN Language Considerations - A Guide to Common Problems*
16	10/15/86	*IMAGE: Updating to TurboIMAGE & Improving Data Base Loads*
17	11/01/86	*Optimizing VPLUS Utilization*
18	11/15/86	*The Case of the Suspect Track for 792X Disc Drives*
19	12/01/86	*Stack Overflows: Causes & Cures for COBOL II Programs*
20	1/01/87	*Output Spooling*
21	1/15/87	*COBOLII and MPE Intrinsics*
22	2/15/87	*Asynchronous Modems*
23	3/01/87	*VFC Files*
24	3/15/87	*Private Volumes*
25	4/01/87	*TurboIMAGE: Transaction Logging*
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27	5/01/87	*HPTrend: An Installation and Problem Solving Guide*
28	5/15/87	*The Startup State Configurator*
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