Integrating MPE XL: A True Story...

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Introduction

The recent introduction of the Hewlett-Packard Precision Architecture family of machines presents several growth path opportunities into the next decade. MPE based environments will need to be migrated to the MPE XL based environments found on the HPPA machines. While lots of attention has been focused on the compatibility mode (CM) versus native mode (NM) arena, the successful integration of an HPPA machine requires a larger view than just the CM/NM issues found in the application systems of the local environment. A true migration needs to include the analysis and resolution in the functional areas of Operations and System Management plus the aforementioned Application area. Our shop addressed these functional issues and the results of this work was the replacement of an HP3000 Series 70 by a HP3000 Series 950 over a weekend with no true loss in user functionality!

The preparation required to perform the task of a migration from a classic machine to that of a HPPA machine is the key to the success of a migration. Proper planning, realistic time schedules, correct and adequate technical skills can be leveraged together with the end result being a transparent (to your users!) movement to a MPE XL based environment. You don't have to perform a switch over a weekend like we did, but with a proper emphasis on the aforementioned basic details, integrating an HPPA machine can be painless.

Each functional area is equal in importance. Without one, all others will be weakened in their chance for achieving a transparent migration. Attention to details in each will insure success. Knowledge of your local environment combined with the preparation mentioned above contributes to the success. Now, let us look at the major functional areas that need to be addressed. While only an overview is presented here, the items discussed here should help a site in getting a handle on their migration directions.

System Management

The changes in this area are great and operating procedures that experienced System Managers have grown accustomed to on MPE V/E are obsoleted by the tools available on MPE XL. However, the changes are augmented by positive movements in flexibility. Described below are some of the major tools that a System Manager will use, again this is a brief overview, knowledge of these skills will provide a high degree of [illegible] any MPE XL installation.

SYSGEN

SYSGEN used to configure machine attributes is an interactive or batch tool with a hierarchical structure. Gone is the linear methodology of SYSDUMP. Parameters are keyword or positional with the specific areas of system configuration partitioned into menus. Finalized system configurations are "kept" as a set of logically related files in a user determined group of the SYS account. The group structure allows for multiple configurations to be in place on the machine at the same time. Activation of the selected configuration is accomplished by a simple parameter on the MPE XL boot command. Users of SYSGEN will enjoy the flexibility and functionality that does not exist in SYSDUMP. The menu driven user interface allows System Managers to easily and rapidly see their machine environment.

VOLUTIL

Disc drive characteristics are handled by the system utility VOLUTIL. This tool is analogous to the MPE V/E VINIT subsystem albeit much more powerful. Local considerations come into play here. Does the shop require non-system defined disc volumes? Or on the other hand, does the shop require all disc volumes to be MPE XL volume set members? There are advantages to both options. Selecting non-system volume domains allows for portability of data. Also, a drive can be downed on the machine without causing harm. Complete MPE XL volume set members are defined once and do not need any management of directory entries . Whatever option is chosen, VOLUTIL is the tool that formats, initializes and labels disc volume labels. Disc space storage parameters for disc files "permanent space" and virtual memory "transient space" are allocated during VOLUTIL work. Volumes can be defined before they actually reside on the machine allowing for quick and easy disc drive additions. The VOLUTIL manual has several examples of how to utilize the tool to your advantage. Understanding the logic behind Volume Management will be advantageous to new HPPA System Managers.

NMMGR

Network Management is altered by the appearance of the Distributed Terminal Controller (DTC). No more ADCCs or ATPs, all hardwired terminal connections are made via this asynchronous box. Multiple DTCs can exist on your machine and they are extremely portable. Configuration of terminal ports as well as NS XL is accomplished thru the NMMGR utility. Any network related configuration issue is handled by NMMGR. While system to system configuration is similar to that of NS/3000, the work required to configure terminal ports brings into play some new terms. Term Types are replaced by Profiles which allow NMMGR to understand the specific type of connection being configured. Modems, direct connect ports, serial printers all have different Profiles. Once site network configuration parameters are complete, a Validation function is executed from within NMMGR to allow the user to check their work for logical inconsistencies. To properly utilize NMMGR, the System Manager will need to know the hardware addresses ("paths") of the LANIC cards (XL machines use two) used for NS XL services and DTC services. Sample configuration files are provided on the MPE XL FOS/SUBSYS tape to expedite network configuration. These files contain the basic network configuration infrastructure, the user can then customize these generic files to fit their specific requirements.

These three tools are the basic tools needed by the site System Manager to get a MPE XL machine operable. Other tools complement these to provide a set of tools to allow for proper system management. Programs such as: FSCHECK for file management, DIRMIG for directory migration, DISCFREE for disc space reporting are just a few. Successful understanding of these tools is paramount if your MPE XL integration is to succeed.

Operations

Cosmetically, Operators see pretty much what Operators see currently on MPE V. Underlying this "compatibility mode" appearance are drastic changes in system Start Up/Shutdown, "Reloads", and Store/Restores. Again, much like the System Management tools, these changes are positive in nature. The flexibility, freedom, and functionality inherent in these new Operations tools overcome any initial learning curve requirements.

Starting up and shutting down a MPE XL system is a logical place to begin. The MPE XL Initial System Loader (ISL) command START is used to facilitate a system boot which saves spoolfiles. The same command modified with a NORECOVERY option is the equivalent COOLSTART command. UPDATE CONFIG replaces COLDSTART and INSTALL acts as the Reload equivalent. LDEV 1 is still "used" on START and START NORECOVERY. Remember that we can keep multiple configurations on the machine, these can be activated as needed by the GROUP parameter. The issue of CM/NM also surprisingly appears in the system boot process. The SYSSTART.PUB.SYS file needs to have its' execution blocks defined in MPE V/E terms. The operating system code does not recognize START, START NORECOVERY, etc. Instead the user can map WARMSTART, COOLSTART, etc into their SYSSTART file. Simply restoring your SYSSTART file from the classic machine will facilitate this task.

Shutdowns are more in line with Operator's MPE V/E experiences. CNTL A SHUTDOWN provides the means to properly halt the operating system. CNTL B HALT is replaced by CNTL B RS (Reset System). This command reboots the low level machine code which resets the machine's attributes such as memory. Memory Dump commands exist for the random system abort (MPE XL term for system failures). CNTL B TC preps the machine for the ISL DUMP command.

Simple machine "Reloads" do not exist as we know them in the MPE V environment. On MPE V/E machine, a simple RELOAD followed by the proper option initiates the reload process. When finished with mounting Reload tapes, the Operator has a functional MPE V/E machine. This is not the case on MPE XL. Install is the command used to initiate the Reload equivalent. The major change here is that volume labels need to be added back to the disc volumes if they are MPE XL System volume members. Also, the system directory will need to be "restored" from a NM backup tape. If a site has chosen to use non-system defined volumes then the "Reload" or Install process is much easier, however account management complexity is increased.

Stores/Restores again have a NM or CM option. Native mode stores are faster and have some of the HP TurboStore features built in such as interleaving. The NM store option is the only way to store the system directory as well. Caution should taken when selecting the NM store option as tapes created in this fashion are not portable to classic machines. CM store should be used if portability is an issue. While slower, CM store allows you to have the added capability to port files to classic machines as needed. Hidden in this is also DBSTORE.PUB.SYS, if you are storing a data base that moves to several machines and these machines are a mixture of MPE V/MPE XL CPUs you will want to use the INFO parm TRANSPORT option.

Application Programming

The area with the most press has definitely been that of the CM versus NM issue. Application Programmers will have added complexity than what they have experienced on MPE V/E machines. But a very complete and mature set of tools exist to handle just about any mode of execution that is encountered.

First of all, compatibility mode works as advertised. Simply store your program files on your classic machine and restore them on to your HPPA machine, then run. If porting TurboImage data bases at the same time please remember to disable ILR first. After the data base is restored ILR is not needed as MPE

XL's Transaction Management takes care of ILR functionality. Back to CM, in two years of use at our shop the only problems we have experienced with CM are that of privileged mode CM programs. All other programs tested or in use now in our shop have worked flawlessly. Performance characteristics are surprisingly good. Our shop has seen up to 2x's improvement in some CM applications. While this will obviously vary from site to site, CM performance has yet to be an issue with us.

In between CM and NM is the "pseudo NM" mode of program execution. The Object Code Translator (OCT) is the tool that allows for this mode. OCT, FOS provided, translates CM program and SL files to a pseudo native mode code. An OCT modified program can run faster than CM based programs. A drawback to OCT is the disc space that the translated files take up. Program sizes can grow an order of magnitude. All in all, OCT is a fast and simple way to improve the speed of your CM programs. Experiment with specific programs to see if OCT provides you with increased throughput.

Finally there is native mode. Using the proper compiler command file the switch to NM is not that difficult. COBOLII was our shop's main language tested with NM. The only modifications we had were on old COBOL program files. All others were pretty much recompile and run! Other languages may require some attention to $CONTROL statements to maintain proper data alignment. In compiling to NM remember that you are locking yourself into the HPPA architecture. If your location has several HPPA machines this is not a problem. However if your shop is in a MPE/MPE XL environment be cognizant of the support issues regarding application run time choices. It is far easier to support CM across MPE V/MPE XL families than to have exception NM support. Our shop has used our S/950 in integration testing of major software packages before loading them on to our classic machines. Our CM tests have completed without incidence or any major obstacles. HP has done a fairly complete job in assuring that migration is not an issue. Modes of operation (CM, OCT, or NM) are the choice of the user. All have advantages, all have disadvantages. The best decision is made by the local team comprised of the application programming staff. Tools here provide you with quality choices whatever the mode of operation may be.

In addition to the CM/NM areas a full complement of utilities exist to support the compilers found on the MPE XL machine. If CM is the chosen mode you will find a CM Segmenter to maintain your SL and USL files. On the NM side is the powerful and flexible LinkEditor tool to handle linking and management of your native mode object modules. DEBUG is combined into one program that has a CM mode as well as a NM mode of operation. Users of Debug will be pleased with the increased functionality of the product. It has a Windows like operation that allows a user to define variables which can be set in partitions of the window. Another tool is the the Switch Assist Tool (SWAT) which allows a user to create switch stubs for a NM program that needs to call a CM subroutine. With a View driven interface this tool allows a native mode programer to create the source code needed by a NM program so that a CM subroutine can be called.

The migration from classic to HPPA can be as challenging as you want it to be. A full native mode migration will require recompilation and testing. A pure compatibility mode migration can be as simple as Store/Restore and Run. Obviously time and support issues dictate what path is chosen. CM is the preferred mode in our shop at this time. This is due to the fact that we support several CPUs, the majority of which at this time are classic machines. Yet CM on MPE XL has proven totally acceptable in our experiences. Positive surprizes such as improved performance were exiting to see. What migration path a shop decides upon in the application area is up to that shop's staff. The issues of time, support, performance all need to be resolved satisfactorily. What ever path is chosen, the tools needed are present and waiting to be used.

Conclusion

MPE XL is here, it is functional, and it is powerful. The product provides the tools necessary to smoothly, professionally, and transparently move a HPPA machine into a user environment. Focusing time to learn the nuances of the Operations, System Management, and Application Programming areas will insure a successful migration. Take advantage of the resources available to your site. Attend and participate in Hewlett-Packard classes to gain valuable experience and exposure to MPE XL. Prepare in advance on your MPE V/E machine by using the tools such as Run Time Event Logging (RTEL) and Object Code Analyzer (OCA) to pre-identify any migration issues. Order manual sets ahead of time to get a feel for the activities that will take place. Consult with your SR and SE on migration issues, bring them in to the planning of your migration. Work together so that all issues are identified and resolved in a satisfactory manner. Performing these steps will guarantee the success of the integration of a HPPA machine into your shop. We did it and so can you!