

HP-UX Commands for the MPE/iX User

Presentation # 250

Presented By

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Introduction

This paper will discuss the following three areas:

1. The basic concepts needed to make the change from MPE/iX to UNIX and beyond.
2. The commands needed to accomplish tasks and what the commands relate to on MPE/iX.
3. The UNIX-based tools that will help in making the transition from MPE/iX to UNIX.

Basic Concepts

- Operating System vs. the kernel
- Command Interpreter vs. shell
- MPE/iX Execution Queues vs. HP-UX Scheduler
- Manager.sys vs. root (Superuser)
- Hierarchical Structure vs. Tree Structure

Basic Concepts

- Scheduling capabilities of Stream vs. cron
- Logon UDC's vs. .profiles and Aliases
- MPE/iX File System vs. HP-UX file systems
- Help vs. Man Pages
- Hello vs. login
- File labels/codes vs. file extension/magic number

Operating System vs. the kernel

- Kernel manages memory, system resources, file systems, controls access to system.
- Kernel has parameters that may be “tuned”.
 - www.hp-partners.com/edaweb_public/html/technical_support/tuning.html

Command Interpreter vs. shell(s)

- CI on MPE/iX is replaced by shells in unix.
- Shell is a language interpreter
- MPE/iX has two shells while UNIX has many
- UNIX Shells:
 - **Sh – Bourne shell – default prompt is “\$” - oldest**
 - **ksh - the korn shell – prompt is**
 - **csch - the C shell – default prompt is “#”**
 - **Posix shell**

Shells

- Shell set in `.profile` and set at login
- Move to another shell by typing the shell name
 - Example `'ksh'` drops you to the korn shell
- Permanent change to shell?
 - `'chsh jeffk /usr/bin/csh'`
 - The change takes place upon the next login.

MPE/iX Execution Queues vs. HP-UX Scheduler

- MPE contains five default execution queues. These made for an easy management of interactive users versus batch users.
- HP-UX lacks this clear definition between interactive and batch.
- Following slides show the differing setup

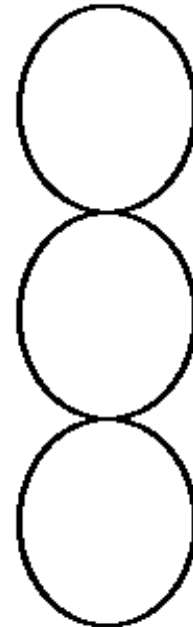
MPE/iX

Interactive
Users

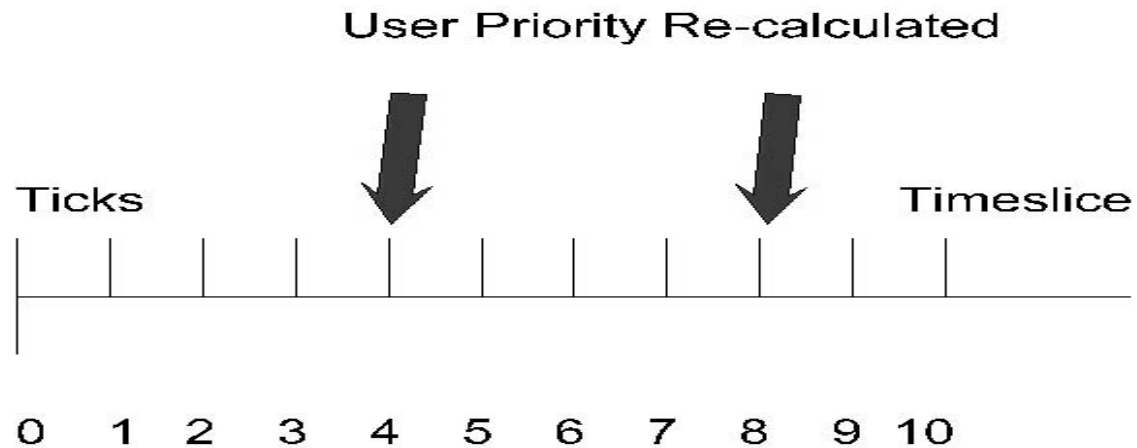
Hi-Pri
Batch

Lo-Pri
Batch

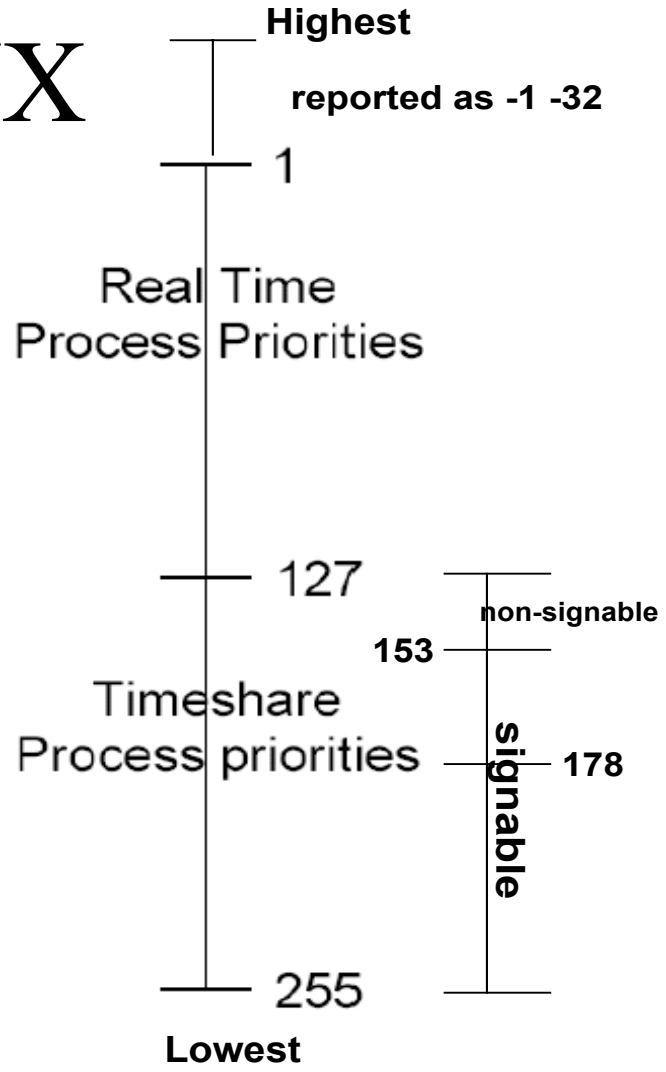
	30
A	99
	100
B	150
	152
C	200
	202
D	238
	240
E	253



HP-UX Priority Re-Calculation



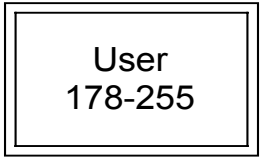
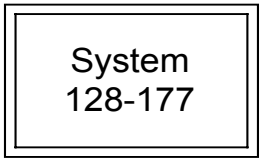
HP-UX



Rtsched

CPU: Process
Priorities

rtprio



HP-UX Scheduler

- While HP-UX doesn't differentiate between logged on users and jobs (for priority) this can still be accomplished in a number of manners:
 - Nice command
 - 'nice -10 commandname'
 - Rtprio command
 - 'Rtprio 127 commandname'
 - Rtsched command
 - 'rtsched -s SCHED_RTPRIO -p 127 commandname'

Manager.sys vs. root (Superuser)

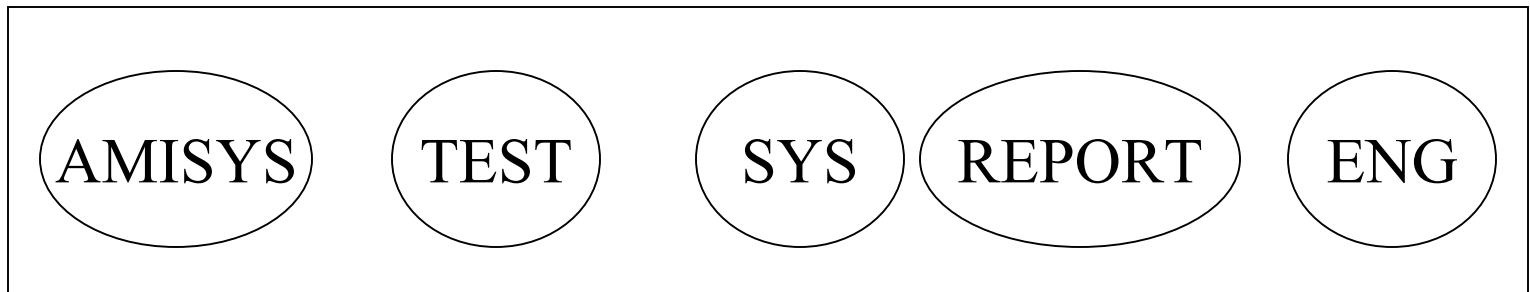
- Superuser on Unix is root!
- ‘root’ problem:
 - ‘root’ circumvents all security checks! ‘root’ can do anything.
 - Best practice is for SM to only log on to ‘root’ when required.
 - Log on as a regular user and use the ‘su’ command.

Hierarchical Structure vs. Tree Structure

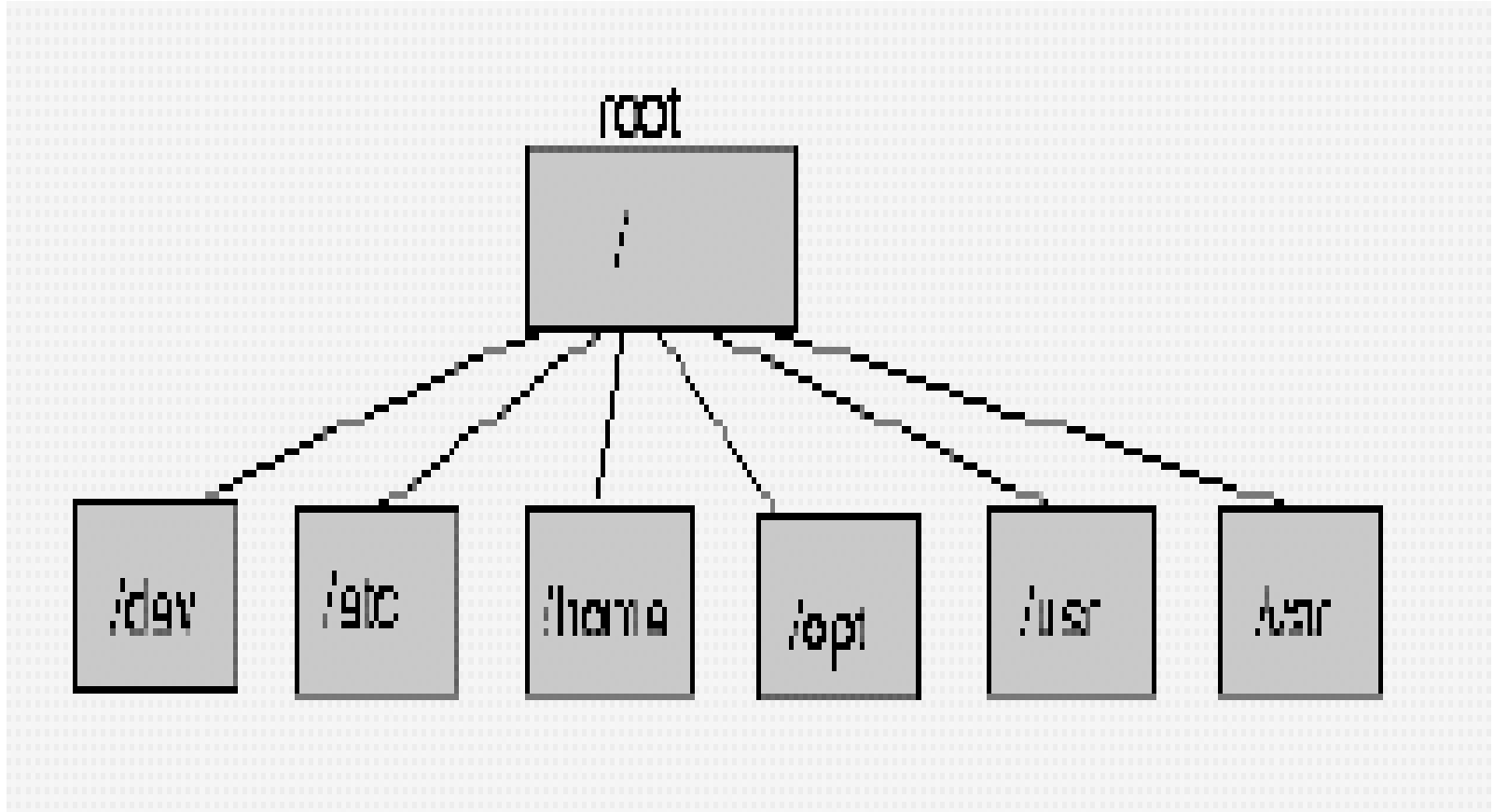
- MPE/iX structure is a flat ‘hierarchical’ structure with groups under accounts.
- HP-UX uses a “tree” structure.

MPE Account Structure

- Accounts
 - System divided into accounts
 - Unique file domain
 - Account has many users, one user required



Unix Directories



Scheduling capabilities of Stream VS. cron

- ‘cron’ command allows scheduling by date, time.
‘cron’ is the time – job execution daemon.
- Can specify the hour, minute, month, day, etc.
- ‘cron’ is the scheduling process, ‘crontab’ is the command used to schedule
 - ‘crontab – e’ to edit a schedule
 - ‘crontab – l’ to list the file
 - ‘crontab – r’ to remove a file from the schedule directory

Logon UDC's vs. .profiles and Aliases

- Logon UDC's allow the execution of commands upon logon
- .profiles and aliases provide the similar capability in unix.
- Basic '.files' executed are the
 - .cshrc an the .login (this order)
 - Other files like '.profile' are executed.

Aliases

- Aliases usually setup in a `.cshrc` file so they are in use at login.
 - Alias command form is `'alias dir ls -al'`
 - `alias ckuser='more /etc/passwd | grep '`
 - `alias listf="ll -al"`
 - `alias showjob="ps -ef"`
 - `alias showtime="date"`

MPE/iX File System vs. HP-UX file systems

- HP-UX has multiple file systems
 - HFS – High Performance Filesystem
 - JFS – Journaled File System
 - Raw I/O that goes directly to disk is also possible.
 - Journaled File System (VxFS) is now the safest and can be tuned to be fast.

Path	Purpose
/	Root directory
/bin	Basic commands
/usr/bin	More commands and executables
/usr/etc	System administration commands
/usr/adm	Accounting files, system administration data files
/usr/spool	Spooling directories
/etc	Startup and configuration and some administration commands
/lib	C libraries
/dev	Device files directory
/tmp	World-writable storage for temporary files

Help vs. Man Pages

- ‘man’ command is the help facility in hp-ux and unix.
- Form of ‘man -k commandname’
 - Here are some quick commands used in Man:
 - Q – quit
 - Enter key – go forward one line
 - Space Bar – go forward one page
 - B – go back one page
 - / - search forward for a pattern
 - n – find the next occurrence of a pattern
- Send a man page to disk
 - ‘man ll > llmanpage’

Hello vs. login

- No longer the polite ‘hello’, with unix simply supply the logon name.
- HP-UX logon will do the following:
 - Check daemon security is passed
 - Check login name/password
 - Trusted system?
 - Disk quotas?
 - Execute shell initialization
 - Executes scripts

Practicing UNIX commands on MPE/iX

- 5.0 and later MPE/iX systems have the POSIX shell
- Thus the `sh.hpbin.sys` command will invoke this shell
- `:setcatalog hppuxudc.pub.sys;append` will set up commands to practice HP-UX commands on MPE/iX.

Basic Command Sets

- Hello
- Listf
- showjob
- Copy
- Chgroup
- Setvar
- Purge
- Print
- Build
-
- Login
- 'll', 'ls'
- 'ps -ef'
- 'cp'
- 'cd'
- 'set'
- 'rm'
- 'echo'
- 'touch'

Differing form for use in commands

- Optional commands in man are prefaced by a ‘-’ as in:
 - ‘ls -abcd...’ – ‘ls’ alone is acceptable along with any option
- Commands can be strung together separated by a ‘;’ to be processed sequentially.
 - ‘ls;ll;.... - executed in sequence

Piping

- Piping is a capability lacking in MPE/iX (at least in CI format). Piping uses the ‘|’ to denote the pipe.
- Commands can be strung together with the next command reading the previous commands input.
 - ‘ls -s | sort -n’

File labels/codes vs. file extension/magic number

- Unlike MPE/iX, HP-UX lacks file codes
- HP-UX looks at the file extension and magic number to determine its type.
- Magic number is a special piece of data located at the beginning of the binary data file that indicates the files type.
- MPE has the FILE command that allows for redirection/ HP-UX has a similarity found in the link command. This is called a ‘symbolic link’.

More on Files

- Files are located in subdirectories
- Subdirectories are denoted by ‘/’.
 - /etc/motd
- /etc is a subdirectory off the root directory ‘/’.
When pathnames are from the ‘/’ this is the absolute pathway.
- If the ‘/’ is not used, the action begins from the current directory. \
- File names can be alphanumeric, or numeric with extensions, but may not use the ‘/’.

More on Files

- Any file with a ‘.xxx’ beginning is likely to be an initialization file.
- Initialization files are executed upon logon to tailor the environment to the users needs.
- HP-UX sets up the following initialization files upon the creation of a new user:
 - .cshrc, .exrc, .login, .profile, .sh-history

```
#
# Default user .cshrc file (/usr/bin/csh initialization).

# Usage: Copy this file to a user's home directory and edit it to
# customize it to taste. It is run by csh each time it starts up.

# Set up default command search path:
#
# (For security, this default is a minimal set.)

    set path=( $path )

# Set up C shell environment:

if ( $?prompt ) then                # shell is interactive.
    set history=20                  # previous commands to remember.
    set savehist=20                 # number to save across sessions.
    set system=`hostname`          # name of this system.
    set prompt = "$system \!: "    # command prompt.

# Sample alias:

alias      h      history

# More sample aliases, commented out by default:

# alias      d      dirs
# alias      pd     pushd
# alias      pd2    pushd +2
# alias      po     popd
# alias      m      more
endif
```

More on Files

- Some common types of files denoted by the extension:
 - .c for source of a C program
 - .o for the object file
 - .errs for errors
 - .output for output from a program
 - .h for a
 - .gzip for a
 - .gz for the gnu version of zip.
 - .tar for tar files

Finding files

- **The find command can be used in a number of manners:**
 - **'find / -name filename -print**
 - **/ starts from the root directory**

File Ownership

- Set by user ID of the logon who creates file
- Owner can set read, write or change, execute privileges
- ‘ls -al’ shows the privileges as in:
 - -rwxrwxrwx 1 root sys 506 May 1 18:48 testfile2
- The first letter indicates the entry type with the following meanings: d – directory, b – block special file, c – character special file, l – symbolic link, p – Fifo special file that can also be called a “named pipe”, n – network special file, s – socket, - - ordinary file.

Output Redirection

- Like MPE/iX, the output of a command can be redirected to a file as in:
 - ‘ll > filename’ – redirects stdout to file
 - ‘cmd < file’ - read from stdin
 - ‘cmd >> file’ – append stdout
 - ‘cmd <inputfile> outputfile – redirect stdin and stdout simultaneously
 - ‘cmd | cmd1’ piping stdout from one command to stdin of another

MPE/iX Commands vs HP-UX

MPE/iX	HP-UX
•ABORTJOB	•kill, kill -9
•ALTACCT	•chmod, passwd
•ALTGROUP	•chmod
•ALTSEC	•chmod
•BYE	•exit
•CHGROUP	•cd
•CI	•sh, csh, ksh
•COPY	•cp

MPE/iX Commands vs HP-UX

•EDITOR, QUAD, QEDIT	•vi
•FCOPY	•cp, dd, lp
•FILE	•(implied), ln
•HELLO user.acct	•login user
•HELP	•man
•HPSEARCH, MPEX LISTF	•grep
•LISTF	•ls, find
•LISTGROUP	•ls -l
•LISTREDO	•history, cat sh.history
•NEWACCT	•mkdir
•NEWGROUP	•mkdir

MPE/iX Commands vs HP-UX

•PRINT	•more , cat, lp
•PURGE	•rm
•REDO	•esc k,
•RELEASE	•chmod 777
•RENAME	•mv
•REPORT	•bdf, du, df
•RESTORE	•tar, frecover, cpio
•RUN	•(implied)

MPE/iX Commands vs HP-UX

•SETJCW	•=
•SETVAR	•=, csh – setenv, sh, ksh NAME=value; export NAME
•SHOWGROUP	•pwd
•SHOWJCW	•echo
•SHOWJOB	•ps –ef, who, users
•SHOWME	•whoamI
•SHOWOUT	•lpstat –t
•SHOWTIME	•date

MPE/iX Commands vs HP-UX

•SHOWVAR	•echo, printenv, env, %echo \$NAME
•SHUTDOWN	•shutdown -0 -y, reboot -h
•STORE	•tar, fbackup, cpio
•STREAM	•at, bg, crontab, nohup
•SYSDUMP	•make_recovery
•TELL	•talk, wall, write
•WARN	•talk, wall, write
•WELCOME	•/etc/motd
•Superuser=MANAGER.SYS	•Superuser=root
	•ioscan

MPE/iX Commands vs HP-UX

Purgedir	•Rmdir
Store	Cpio, tar, fbackup
	Which
Dscopy	ftp
God(mpex)	Su
Deletespoolfile	Cancel, lprm
Build	Touch
UDC file option logon	sh .profile ksh .profile and file in ENV variable csh .cshrc, .login, and logout

Getting Help

- Man pages replace the help facility in MPE/iX:
 - ‘man commandname’
 - ‘man -k keyword you wish to find’
 - This does a search of the man pages looking for the keyword

Moving from Directory to Directory

- Chgroup = cd in HP-UX
 - ‘cd /sub-directory/sub-directory/....
 - ‘cd .. The directory *above* the working directory
 - ‘cd \$HOME’ – returns user to home directory
 - ‘cd ~<login>’ – path shortcut to login

Listing filenames/directories

- Listf = ls, ll
 - ‘ls -f ‘ – lists the filename
 - ‘ls -r’ – lists filename in reverse order
 - ‘ls -x’ – sorting across
 - ‘ls -s’ – show the blocks
 - ‘ls -ltr’ – orders listing by date
 - ‘ll’ – show file access, creator, size and filename
 - ‘ll - like ls -l

Checking Processes

- Showjob – ps – shows the processes
 - Use grep to look for specific processes
 - ‘ps -ef | grep “eloqdb”
- Showme – who – shows who is on the system
- Top – shows processes

Top Command

Load averages: 2.31, 1.74, 1.54

102 processes: 100 sleeping, 2 running

Cpu states:

LOAD	USER	NICE	SYS	IDLE	BLOCK	SWAIT	INTR	SSYS
2.31	90.8%	0.0%	9.2%	0.0%	0.0%	0.0%	0.0%	0.0%

Memory: 8272K (5988K) real, 19100K (14528K) virtual, 2184K free Page# 1/8

TTY	PID	USERNAME	PRI	NI	SIZE	RES	STATE	TIME	%WCPU	%CPU	COMMAND
?	1730	root	235	20	448K	184K	run	420:18	65.89	65.78	_mprosrv
?	4615	root	168	20	1272K	520K	sleep	245:01	25.25	25.20	_progres
?	1563	root	128	20	480K	216K	sleep	432:17	2.04	2.04	_mprosrv
?	6187	root	48	0	1732K	1788K	sleep	2:30	1.01	1.01	lpsmid
?	961	root	154	20	8K	16K	sleep	188:53	0.93	0.93	nfsd
This process services NFS requests from remote systems.											
?	962	root	154	20	8K	16K	sleep	185:05	0.91	0.91	nfsd
?	956	root	154	20	32K	40K	sleep	185:28	0.91	0.90	nfsd
?	957	root	154	20	8K	16K	sleep	187:26	0.90	0.90	nfsd
?	7	root	-32	20	0K	0K	sleep	67:26	0.32	0.32	ttisr
d1p0	6309	root	178	20	208K	308K	run	0:00	0.33	0.29	_mprosrv
?	0	root	127	20	0K	0K	sleep	71:35	0.21	0.21	swapper
?	1407	root	154	20	180K	0K	sleep	71:35	0.22	0.22	swapper
?	2	root	128	20	0K	0K	sleep	18:55	0.21	0.21	vhand
?	1411	root	156	20	180K	68K	sleep	6:32	0.15	0.15	_mprshut

Checking the Environment

- The commands that are available are determined by the PATH variable set at login. The PATH is used by shell to find commands in directories.
- May need to specify full PATH to execute commands not in the PATH directories.
- ‘echo \$PATH’ – shows the path...
- ‘whoami’ – shows how logged on
- ‘uname -a’ – shows the system info

Copying, Moving & Deleting files and Directories

- Copy, rename, purge, newacct, newgroup, purgeacct, purgegrp = cp, mv, rm, mkdir, rmdir.
- Beware of rm *.* as root!

Making life Easier

- Listredo, redo on MPE/iX is replace with various redo capabilities
 - ‘history’- command lists the previous commands
 - ‘esc k’ – together redoes the previous command
 - Hold the ‘esc key down and hit k to walk back through the redo list.
 - Csh uses “!\$” or “!!” to get the previous command

Printing files to Screens

- Print = cat, head, more, tail, echo..
 - ‘more’ – walks through file
 - ‘cat’ – walks through file
 - ‘head’ – prints the beginning of the file
 - ‘tail’ – print the end
 - ‘echo’ – echo items to screen

Looking for Things

- Listf and MPEX = find, grep
 - Find /{begin at root} -name {look for name}
filename -print {print the name}
 - Grep searches for files or strings – ‘grep
“string”’
 - ‘ls -al | grep “filename”’

Fixing the Environment

- When things don't work how to fix them?
 - MPE/iX often checking the Path, environment variables, user/account/group capabilities, file access would lead to a solution.
 - HP-UX try printenv to check environment variables, check the ls -al to see the access information, chmod/chown to fix files
 - PATH=\$PATH:/jeff/new adds to the path the subdirectory that may be required.

Setting up the Terminal

- Set the terminal to HP
 - TERM=hp
- Terminal types kept in /etc/termcap
- Terminal is normally set up via login, but there are occasions where you must set the terminal up and set the backspace, etc.

The importance of STTY

- Have you experienced problems with backspace? Other weird effects?
- A lack of proper usage of the stty command is the culprit.
 - ‘stty erase “^H” kill “^U” intr “^C” eof “^D”
 - This should be in the .profile file to setup these options for the terminal port.
 - ‘stty -a’ displays the current settings.

Commands to help with the Transition

- Much work can be done with SAM – System Administration Manager
- HP Eloquence is an IMAGE like database for HP-UX
 - SUPRTOOL from Robelle works on ELOQUENCE.
- Aliases can be used create commands like MPE/iX

Editors on HP-UX

- Vi is the universal editor in Unix and on HP-UX.
- Other editors are available. Even ones you may be used to in MPE/iX will work on HP-UX. Example: Qedit
- Form of vi
 - ‘vi filename’

Some Simple VI Commands

- Here is a simple set of commands to get a beginning VI user started. There are many other convenient commands, which will be discussed in later sections.
- a - enter *insert* mode, the characters typed in will be inserted after the current cursor position. If you specify a count, all the text that had been inserted will be repeated that many times.
- h - move the cursor to the left one character position.
- i - enter *insert* mode, the characters typed in will be inserted before the current cursor position. If you specify a count, all the text that had been inserted will be repeated that many times.
- j - move the cursor down one line.
- k - move the cursor up one line.
- l - move the cursor to the right one character position.
- r - replace one character under the cursor. Specify *count* to replace a number of characters
- u - undo the last change to the file. Typing u again will re-do the change.
- x - delete character under the cursor. *Count* specifies how many characters to delete. The characters will be deleted after the cursor.

Scripts

- One of the most powerful aspects of HP-UX and UNIX is the ability to create Scripts to perform complex or repeated tasks. This is also a capability within MPE/iX.
- Scripts are a collection of commands that can be executed via one command.
- The following is a typical Unix shell script skeleton:

Scripts

- `#!/bin/sh` << sets the shell >>
 - The choice of shell can be important as issues such as portability (moving from one system to another) capability and use may vary.
- Name
- Purpose
- Author
- Set the directory
- Do the work
- End the script

Conclusion

- Begin practicing on MPE/iX or HP-UX system available.
- Realize that the same comfort level may not be accomplished.
- Use more manuals and don't be afraid to ask questions.

References

- HP Documentation Archive:
 - <http://docs.hp.com>
 - <http://invent9k.external.hp.com/~csy/cmds.cgi?mpe=summary>
- Robelle Documentation:
 - <http://www.robelle.com/library/smugbook/mpe2unix.html>