Basics of System Admin for Programmers

Pete Massiello

petem592@gmail.com

Petem@Peteandi.com

IBM CHAMPION

How did you get so lucky?

- Who was doing it? What happened?
- Is there any documentation?
- Will you continue or is this temporary?
- This is a 7x24 hour on-call?
- Hardware service?
- Security?
- PTFs?
- OS Upgrades?
- Backups/Restores?
- Disaster Recovery and High Availability?
- Performance Problems?
- Tums

Daily Care and Feeding: DSPMSG QSYSOPR

```
                            Work with Messages
                                                         System:    HOSTP9

      Messages in:    QSYSOPR


      Type options below, then press Enter.
        4=Remove    5=Display details and reply


      Opt    Message
        _        Cleanup of user messages successfully completed.
        _        000007 of 000050 messages deleted from QSRVAGT.
        _        000007 of 000050 messages deleted from QSRV.
        _        000006 of 000045 messages deleted from QPGMR.
        _        Cleanup of job logs and other system output successfully completed.
        _        Cleanup of operator and work station messages successfully completed.
        _        User cleanup program successfully completed.
        _        User cleanup program started.
        _        Cleanup of job logs and other system output started.
        _        Cleanup of operator and work station messages started.
        _        Cleanup of user messages started.
        _        Cleanup has started.
                                                                    More...
      F1=Help    F3=Exit      F5=Refresh    F16=Remove messages not needing a reply
      F17=Top    F18=Bottom   F24=More keys
```

Daily Care and Feeding: WRKACTJOB

```
                        Work with Active Jobs                    HOSTP9
                                              03/06/23  16:37:37 EST
CPU %:          .0      Elapsed time:     00:00:00      Active jobs:    191


Type options, press Enter.
  2=Change   3=Hold   4=End   5=Work with   6=Release   7=Display message
  8=Work with spooled files   13=Disconnect ...

                        Current
Opt  Subsystem/Job   User          Type   CPU %  Function          Status
█    QBATCH          QSYS          SBS      .0                     DEQW
___  QCMN            QSYS          SBS      .0                     DEQW
___  QCTL            QSYS          SBS      .0                     DEQW
___    DSP01         ITECHSOL      INT      .0    CMD-WRKACTJOB    RUN
___    QSYSSCD       QPGMR         BCH      .0    PGM-QEZSCNEP     EVTW
___  QHTTPSVR        QSYS          SBS      .0                     DEQW
___    ADMIN         QTMHHTTP      BCH      .0    PGM-QZHBMAIN     SIGW
___    ADMIN         QTMHHTTP      BCI      .0    PGM-QZSRLOG      SIGW
___    ADMIN         QTMHHTTP      BCI      .0    PGM-QZSRHTTP     SIGW
                                                                 More...
Parameters or command
===> _____
F3=Exit   F5=Refresh      F7=Find      F10=Restart statistics
F11=Display elapsed data   F12=Cancel   F23=More options   F24=More keys
```

Daily Care and Feeding: WRKSYSSTS

```
                        Work with System Status                    HOSTP9
                                                03/06/23  16:38:55 EST
% CPU used . . . . . . . . :          3.0      Auxiliary storage:
Elapsed time . . . . . . :      00:00:09        System ASP . . . . . . . :        2837 G
Jobs in system . . . . . :          242        % system ASP used  . . . :     13.1149
% perm addresses . . . . :         .012        Total . . . . . . . . . . :       2837 G
% temp addresses . . . . :         .062        Current temporary used  :       11045 M
                                                Peak temporary used  . :       11689 M


Type changes (if allowed), press Enter.


System     Pool     Reserved     Max       -------DB-------   -----Non-DB-----
Pool     Size (M)   Size (M)   Active   Faults      Pages   Faults      Pages
  1      █ 877.63     442.02   +++++        .0         .0       .0         .0
  2       6348.30       6.86     144        .0         .0       .9        2.6
  3        811.87        .00     203        .0         .0       .0         .0
  4         81.18        .00       5        .0         .0       .0         .0


                                                                    Bottom
Command
===>
F3=Exit    F4=Prompt    F5=Refresh    F9=Retrieve    F10=Restart    F12=Cancel
F19=Extended system status         F24=More keys
```

Daily Care and Feeding: WRKDSKSTS

```
                        Work with Disk Status                         HOSTP9
                                                         03/06/23   16:41:09 EST
     Elapsed time:      00:00:05

                    Size      %      I/O    Request   Read   Write   Read   Write    %
     Unit  Type     (M)     Used    Rqs   Size (K)    Rqs    Rqs     (K)    (K)    Busy
        1  5B41   257949    13.5    58.0      12.0    58.0     .0    12.0     .0      2
        2  5B41   257949    13.0    64.5      12.2    64.5     .0    12.2     .0      4
        3  5B41   257949    13.0    62.5      12.7    62.3     .1    12.7    16.0     5
        4  5B41   257949    13.0    64.7      12.8    63.1    1.5    12.5    25.0     4
        5  5B41   257949    13.0    62.5      12.5    62.3     .1    12.5    20.0     4
        6  5B41   257949    13.0    63.3      12.5    62.7     .5    12.6     5.3     4
        7  5B41   257949    13.0    64.9      12.7    64.7     .1    12.7     4.0     4
        8  5B41   257949    13.0    61.9      12.8    61.3     .5    12.9     8.0     4
        9  5B41   257949    13.0    60.3      13.0    59.7     .5    12.9    24.0     5
       10  5B41   257949    13.0    60.9      12.8    60.1     .7    12.6    26.0     5
       11  5B41   257949    13.0    57.0      12.4    56.8     .1    12.4    28.0     4

                                                                             Bottom
     Command
     ===> █
     F3=Exit    F5=Refresh    F12=Cancel    F24=More keys
```

Daily Care and Feeding: WRKDSKSTS

```
                          Work with Disk Status                         HOSTP9
                                                          03/06/23  16:41:09 EST

       Elapsed time:      00:00:05


                     --Protection--
       Unit  ASP   Type   Status      Compression
         1    1    DPY    ACTIVE
         2    1    DPY    ACTIVE
         3    1    DPY    ACTIVE
         4    1    DPY    ACTIVE
         5    1    DPY    ACTIVE
         6    1    DPY    ACTIVE
         7    1    DPY    ACTIVE
         8    1    DPY    ACTIVE
         9    1    DPY    ACTIVE
        10    1    DPY    ACTIVE
        11    1    DPY    ACTIVE





                                                                        Bottom
```

Daily Care and Feeding: WRKPRB

```
                              Work with Problems
                                                         System:    HOSTP9
         Position to . . . . . . .    █_____           Problem ID

         Type options, press Enter.
           2=Change    4=Delete    5=Display details     6=Print details
           8=Work with problem    9=Work with alerts    12=Enter text



         Opt   Problem ID   Status       Problem Description

            (No problem records available containing requested data.)
```



```
                                                                        Bottom
         F3=Exit       F5=Refresh     F6=Print list     F11=Display dates and times
         F12=Cancel    F16=Report prepared problems     F24=More keys
```

Daily Care and Feeding: SNDSRVRQS

```
                    Send Service Request (SNDSRVRQS)

Type choices, press Enter.


Action . . . . . . . . . . . . .   *test          *PREPARED, *OPENED, *TEST...
Remote control point . . . . . .   *IBMSRV        Name, *IBMSRV, *CIM, *SELECT
Remote network identifier  . . .   *NETATR        Name, *NETATR




                                                                        Bottom
F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel    F13=How to use this display
F24=More keys
Connecting to remote system - please wait
```

Daily Care and Feeding: SNDSRVRQS

```
                    Send Service Request (SNDSRVRQS)

Type choices, press Enter.


Action  . . . . . . . . . . . . .   *test         *PREPARED, *OPENED, *TEST...
Remote control point . . . . . .    *IBMSRV       Name, *IBMSRV, *CIM, *SELECT
Remote network identifier  . . .    *NETATR       Name, *NETATR















                                                                     Bottom
F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel    F13=How to use this display
F24=More keys
Sign-on to service support system in progress.
```

Daily Care and Feeding

- DSPMSG QSYSOPR
- WRKSYSACT
- WRKSYSSTS
- WRKDSKSTS
- WRKPRB
- Checking your backup job
  - Did it end successfully?
  - Is it still running?
  - What's changed that hasn't been backed up?

Daily Care and Feeding

- Checking your backup job
  - Did it end successfully?
  - Is it still running?
  - What's changed that hasn't been backed up?
- Is the attention light on?
- Service Tools – Do you have a valid user?

Terms

- BRMS – Backup Recovery Media Services
- Restricted State – All Subsystems ended
- PTFs – Program Temporary Fixes
- SST – System Service Tools
- DST – Dedicated Service Tools
  - Differences between Function 21 or Manual IPL
- Load Source – Disk with License Internal Code (LIC)
- ASP – Auxiliary Storage Pools
- iASP – Independent Auxiliary Storage Pools

Generate List of Files

SELECT SYSTEM_TABLE_SCHEMA, SYSTEM_TABLE_NAME, SYSTEM_TABLE_MEMBER, NUMBER_DELETED_ROWS, NUMBER_ROWS AS NUMBER_ACTIVE_ROWS, NUMBER_DELETED_ROWS + NUMBER_ROWS AS TOTAL_ROWS,

CASE NUMBER_ROWS WHEN 0 THEN 100.00

ELSE

(CAST(NUMBER_DELETED_ROWS AS DEC(10, 0)) /

(CAST(NUMBER_DELETED_ROWS AS DEC(10, 0)) +

CAST(NUMBER_ROWS AS DEC(10, 0)))) * 100

END AS Percent_Deleted, DATA_SIZE / 1000000 AS Data_Size_in_MB,

(DATA_SIZE / 1000000) *

(CAST(NUMBER_DELETED_ROWS AS DEC(10, 0)) /

(CAST(NUMBER_DELETED_ROWS AS DEC(10, 0)) +

CAST(NUMBER_ROWS AS DEC(10, 0)))) AS Data_Size_in_MB_to_Reclaim

FROM QSYS2.SYSPARTITIONSTAT WHERE NUMBER_DELETED_ROWS > 0

ORDER BY NUMBER_DELETED_ROWS DESC

140

Generate List of Files

```
                              Display Data
                       Data width . . . . . . . :        222
Position to line  . . . . .   _____     Shift to column  . . . . . .   _____
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....
System         System         System                 Number         NUMBER_A
Table          Table          Table                  Deleted
Schema         Name           Member                 Rows
AMFLIB         MBA2CPP        MBA2CPP                4,567,356
EDI4XXDTA      EDINBX         EDINBX                 2,308.940                    Display Data
EDI4XXDTA      EDOTWK         EDOTWK                 1,6                                   Data width . . . . . . . :        222
AMFLIB         NMSMWK         NMSMWK                 1,3     Position to line  . . . . . .   _____     Shift to column  . . . . . .      _____
MIMIX          MX3200P        MX3200P                1,2     8....+....9....+....10....+....11....+....12....+....13....+....14....+....15....+..
AMFLIB         MNHHDR         MNHHDR                 1,2     CTIVE_ROWS                 TOTAL_ROWS                       PERCENT_DELETED
FMFLIB         FBKOREP        FBKOREP                1,2
EDI4XXDTA      EWMPSYPF       EWMPSYPF               1,1
EDI4XXDTA      EDMPSYPF       EDMPSYPF               1,1        4,803,909                 9,371,265          48.7378811718588665732000
EDI4XXDTA      EWCPSSPF       EWCPSSPF               1,1        1,368,937                 3,677,877          62.7791522119962141202000
AMFLIB         ORDLNE         ORDLNE                 1,0        2,359,159                 3,988,473          40.8505711333635704691000
AMFLIB         PSTDTL         PSTDTL                   9                1                 1,381,903          99.9992763602076267290000
QSYS           QADBIFLD       QADBIFLD                 9        1,366,598                 2,613,446          47.7089635676421093070000
EDI4XXDTA      EDSSLK         EDSSLK                   8       28,935,300                30,149,045           4.0258157430857262642000
                                                                     140                 1,206,553          99.9883966970369308269000
                                                                     837                 1,146,638          99.9270039890532147024000
F3=Exit      F12=Cancel      F19=Left      F20=Right            623,193                 1,757,406          64.5390422019726801888000
                                                                 731,921                 1,860,941          60.6693065497509055902000
                                                                  58,263                 1,131,806          94.8522096543047129985000
                                                                 265,014                 1,255,445          78.8908315378212506322000
                                                               1,553,345                 2,464,171          36.9627757164579893197000
                                                                      17                   849,899          99.9979997623246997584000
                                                                                                                                  More...

                                                      F3=Exit      F12=Cancel      F19=Left      F20=Right      F21=Split
```
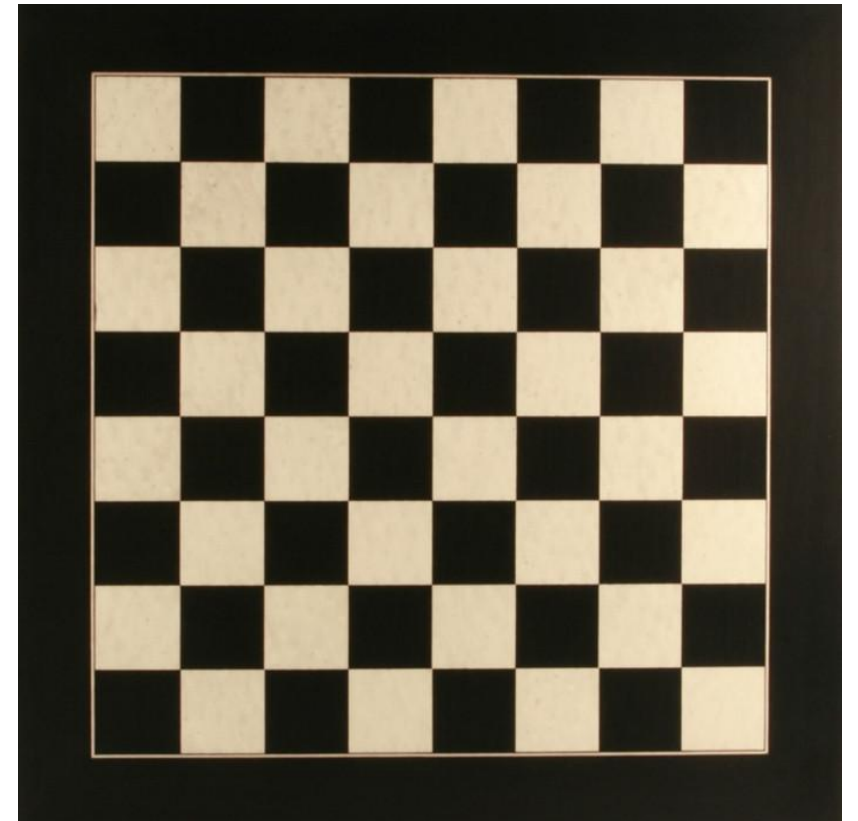
Generate List of Files

Create Query

Select input file as yourlib/DSPFDPF

Select these fields: MBLIB, MBFILE, MBNAME, MBNRCD, MBNDTR, MBDSZ2

Sort by MBDSZ2 Descending

Select records by: MBNDTR GT 0 and MBFILE NLIKE 'QADB%'

List to Work On

```
Session B - [24 x 80]

File   Edit   View   Communication   Actions   Window   Help

                              Display Report
 ■             ■                    Report width . . . . . :        88
Position to line . . . . . . _____   Shift to column . : . : . : _____
Line    ....+....1....+....2....+....3....+....4....+....5....+....6....+....7..
        Library       File         Member         Current          Number Of
                                                   Number Of        Deleted
                                                   Records          Records

000001  TSTMODSDTA    VSADETL      VSADETL         500,862          172,582
000002  QUSRSYS       QAFQSND      QAFQSND             320          159,346
000003  R36M020711    VSADETL      VSADETL         514,734           57,633
000004  R36MODSDTA    VSADETL      VSADETL         447,374           53,471
000005  TSTMODSDTA    VSAHEAD      VSAHEAD         170,373           60,266
000006  WEBTEST       WTDPRDCTG    WTDPRDCTG         8,203        8,499,716
000007  R36M020711    VSAHEAD      VSAHEAD         176,509           20,248
000008  R36FILES      VARCASH      VARCASH         791,934                1
000009  R36MODSDTA    VSAHEAD      VSAHEAD         149,467           18,477
000010  TSTFILES      VARCASH      VARCASH         715,382                1
000011  R36F020711    VARCASH      VARCASH         654,544                1
000012  R36FILES      VINITMB      VINITMB          62,943                1
000013  TSTFILES      VINITMB      VINITMB          61,767               38
000014  TSTFILES      VSAHOLD      VSAHOLD              13           70,862
                                                                  More...
F3=Exit        F12=Cancel        F19=Left        F20=Right        F21=Split

MA    B                                                              18/054
I902 - Session successfully started
```
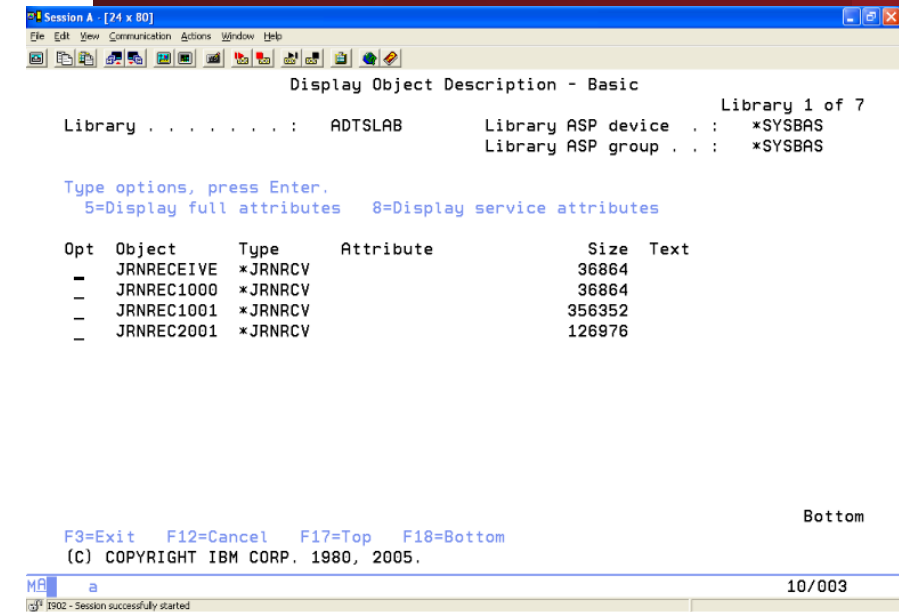
RGZPFM

All Records are stored in pages. Think of a page as a chess board containing:

Deleted records

Active records

KeyFile

- *NONE

- *RPLDLTRCD

- *FILE

Reorganize While Active

Heads-Up

Requires file to be journaled. And, let's discuss the LOCK Parameter.

Performance — Expert Cache

- Part of IBM i
- Look ahead cache
- Used only with Shared Pools
- *CALC Paging Option
- CHGSBSD to use Shared Pools
- WRKSHRPOOL

WRKSYSSTS

Work with System Status   HOSTP9
                                      03/06/23 16:48:19 EST

% CPU used . . . . :   13.5   Auxiliary storage:
Elapsed time . . . . . . :   00:09:32   System ASP . . . . :   2837 G
Jobs in system . . . . . :   240   % system ASP used . . :   13.1142
% perm addresses . . . . :   .012   Total . . . . :   2837 G
% temp addresses . . . . :   .062   Current temporary used :   11024 M
                                              Peak temporary used . :   11689 M

Type changes (if allowed), press Enter.   **How to Activate**

System   Pool   Reserved   Max   Paging
Pool   Size (M)   Size (M)   Active   Option
  1   877.63   442.00   +++++   *FIXED
  2   6348.30   6.86   144   *CALC
  3   811.87   .00   203   *CALC
  4   81.18   .00   5   *CALC

                                                          Bottom
Command
===>
F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F10=Restart   F12=Cancel
F19=Extended system status   F24=More keys

35

WRKSHRPOOL

```
                          Work with Shared Pools
                                                        System:    ITECH07

Main storage size (M)  . :            8119.00

Type changes (if allowed), press Enter.


                   Defined     Max    Allocated   Pool   -Paging Option--
Pool               Size (M)  Active   Size (M)     ID    Defined  Current
*MACHINE            566.16   +++++      566.16      1    *FIXED   *FIXED
*BASE              6856.97    1047     6856.97      2    *CALC    *CALC
*INTERACT           614.67     100      614.67      3    *CALC    *CALC
*SPOOL               81.18      10       81.18      4    *CALC    *CALC
*SHRPOOL1              .00       0                       *FIXED
*SHRPOOL2              .00       0                       *FIXED
*SHRPOOL3              .00       0                       *FIXED
*SHRPOOL4              .00       0                       *FIXED
*SHRPOOL5              .00       0                       *FIXED
*SHRPOOL6              .00       0                       *FIXED
                                                                 More...
Command
===> _____
F3=Exit    F4=Prompt   F5=Refresh    F9=Retrieve   F11=Display tuning data
F12=Cancel
```

Performance

QPFRADJ

    0 No Adjustment

    1 Adjustment at IPL

    2 Adjustment at IPL & Automatically

    3 Automatically

Save Files

Can be a big payoff, BUT …

You need to decide which ones to keep and which ones to delete.

Find out Date last used, Date when created, and by what UserID.

Don't delete any of them in Q libraries.

DSPSAVF to help you decide.

Backup to Special Tape before delete.

Caution

Generate List of Files on the System

Create Query

Select input file as yourlib/DSPSAVFS

Select these fields: ODLBNM, ODOBNM, ODOBSZ, ODOBOW, ODLDAT , ODUDAT

Sort by ODOBSZ Descending

Select records by:

     ODOBAT EQ   'SAVF'

List of Save Files

Old Journal Receivers

- DSPOBJD OBJ(*ALL/*ALL) OBJTYPE(*JRNRCV)
- Ones people forgot about and they just grow.
- Sequence number jump.

Collect Disk Information

You can run RTVDSKINF to Collect Disk Information, or you can use the DISKTASKs Menu.

You will want to run the RTVDSKINF command in Batch.

Using the DISKTASKs menu, you can select option 1 to automate the collection of the RTVDSKINF information on a selected interval (Daily, Weekly, or monthly).

GO DISKTASKS

```
DISKTASKS                         Disk Space Tasks
                                                        System:    ITECH07
To select one of the following, type its number below and press Enter:


     1. Collect disk space information
     2. Print disk space information

    10. Work with libraries
    11. Work with folders
    12. Work with objects by owner





Type a menu option below

      ▬

F1=Help    F3=Exit    F9=Command line    F12=Cancel
```

```
MA  +  F                                                     21/007
```

Collect Disk Information

```
                    Collect Disk Space Information                    ITECH07
                                                         04/14/21   13:05:54


    Information collected . . . . . . :    04/11/21   06:00:00



    A job will be submitted to collect disk space information.  This job may
    take several hours to complete, depending on the size of your system.



    Type choice below, then press Enter.


      When to collect information . . .    _       1=Date/time
                                                   2=Weekly
                                                   3=Monthly








    F1=Help    F3=Exit    F12=Cancel
    Weekly collection scheduled on *SUN, 04/18/21, at 06:00:00.
```

Print Disk Information

```
                        Print Disk Space Information                    ITECH75
                                                     02/09/23   15:57:32 EST
        Information collected . . . . . . . :    02/09/23   15:49:48



        Select one type of report below,  then press Enter.
          1=Select


        Opt       Type of Report
         1        Library
         _        Folder
         _        Owner
         _        Specific object
         _        System summary information










                                                                      Bottom
        F1=Help    F3=Exit    F5=Refresh    F12=Cancel
```

MA + A   MW   10/003

Library Level

All objects Over 10 MB

```
                           Customize Object Report                    ITECH75
                                                    02/09/23  16:50:17 EST
        Information collected . . . . . . :    02/09/23  15:49:48


        Type choices below, then press Enter.

          Objects and object types to include:
            Objects . . . . . . . . . . . . .   *ALL_____      Name, generic*, *ALL
                 Object types  . . . . . . . .   *ALL____       Name, *ALL
                                                 _____
                                                 _____
                                                 _____

            Size of smallest object . . . .    9999█            Size in 1000 bytes
                                                                 (1=1000)




                                                                       More...
          F1=Help    F3=Exit    F5=Refresh    F12=Cancel
```

MA + A   MW   15/044

All Objects Over 10 MB (cont.)

Session B - [24 x 80]

File Edit View Communication Actions Window Help

```
                            Display Spooled File
File . . . . . :        QPEZDISK                    Page/Line   4/1
Control : . . . :        _____                Columns     1 - 78
Find  . . . . . :        _____
*....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+...
                                                    Disk Space Report

5761SS1 V6R1M0    080215
                                                    Specific Object Informatio
                                             % of                Size in   Las
 Object        Library     Type      Owner   Disk           1000 bytes   Cha
 SV_PRODF      SVPRD2TST   *FILE     VAIGROUP  .74           7219994.6   03/
 SV_TESTF      SVPRD2TST   *FILE     VAIGROUP  .71           6915907.6   03/
 SV_TSFILES    RES         *FILE     VAIGROUP  .60           5815427.1   03/
 SV_PRODM      SVPRD2TST   *FILE     VAIGROUP  .16           1535139.8   03/
 SV_TESTM      SVPRD2TST   *FILE     VAIGROUP  .15           1490575.4   03/
 VARGLMP       R36FILES    *FILE     VAIGROUP  .14           1325473.8   11/
 SV_TSMODSD    RES         *FILE     VAIGROUP  .13           1285054.5   03/
 VARGLMP       TSTFILES    *FILE     VAIGROUP  .12           1191252.0   03/
 VARGLMP       R36F020711  *FILE     VAIGROUP  .11           1079984.1   08/
 QPZ1DIRPRD    QWEBQRY76   *FILE     PETEM     .09            851533.8   08/
 VSAANAL       R36FILES    *FILE     VAIGROUP  .07            676470.8   11/
                                                                  More...
 F3=Exit    F12=Cancel    F19=Left    F20=Right    F24=More keys
```

MA   B   MW   03/022

1902 - Session successfully started

Get the Directory Information

- The Retrieve Directory Information (RTVDIRINF) command is used to collect attributes for directories and files in the Integrated File System. The collected information is stored in database files that are named using the information file prefix specified by the INFFILEPFX parameter. The files are created in the library specified by the INFLIB parameter, defaults to QUSRSYS.

- You will want to run this in batch.

- You can run the Print Directory Information (PRTDIRINF) command to print reports using the retrieved directory information.
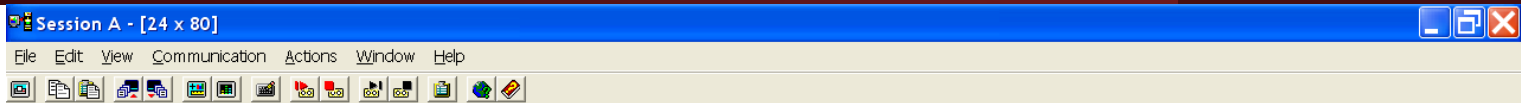
Retrieve Directory Information (RTVDIRINF)   Level: 2

Type choices, press Enter.

Directory . . . .   /_____

_____
Directory subtree . . . .   *ALL   *ALL, *NONE
Information file prefix . . . .   *GEN   Name, *GEN
Information library . . . . . .   QUSRSYS   Name

                                                                        Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys

MA   a   MW   05/038
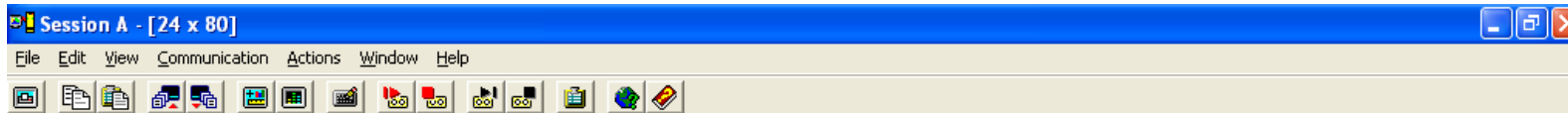
Print Directory Information (PRTDIRINF)

Type choices, press Enter.

```
Type of report . . . . . . . . . . > *DIR          *DIR, *OBJ, *OWN
Information file prefix  . . . .   *LAST          Name, *LAST
Information library  . . . . . .   *LAST          Name, *LAST
Directory subtree  . . . . . . .   *ALL           *ALL, *NONE
```

Bottom

F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys

Display Spooled File screen:

```
                                Display Spooled File
File  . . . . . . :        QPEZDIR                      Page/Line    3/14
Control . . . . .         W22_____                     Columns      22 - 99
Find  . . . . . .         _____
...+....3....+....4....+....5....+....6....+....7....+....8....+....9....+....
stream files type 2                                                  0
objects being journaled                                              0
stream file with sever digital signatures                            0
files checked out                                                    0
_____
/QOpenSys/QIBM/ProdData/OS400
                                                          Number of
                                                           Objects
this directory                                                2
objects in this directory and subdirectories               2210
storage freed files                                           0
local files                                                   1
hidden files                                                  0
stream files type 2                                           0
objects being journaled                                       0
stream file with sever digital signatures                     0
                                                            More...
F3=Exit   F12=Cancel   F19=Left   F20=Right   F24=More keys
```

                                                            03/022

IPL Types

- Normal (Unattended)
- Manual (Attended)
- PWRDWNSYS
    - Restricted State
    - ENDSBS *ALL
    - *IMMED vs *CNTRLD
- GO POWER

Sides of the Microcode

- A – Permanent
- B – Permanent and Temporary

Bezel

Bezel

PTFs Different Types

- Cumulative
- Technology Refresh
  - Group (7.5 SF99757)
  - Marker (7.5 MF994xx)
- Groups
- Individual
  - MF & MJ
  - SI & SJ
  - MH

PTFs

Temp Apply & Perm Apply

```
                              Display PTF Status
                                                        System:    ITECH75
Product ID  . . . . . . . . . . . . . . . :   5770999
IPL source  . . . . . . . . . . . . . . . :   ##MACH#B
Release of base option  . . . . . . . . :    V7R5M0     L00


Type options, press Enter.
  5=Display PTF details    6=Print cover letter    8=Display cover letter
  10=Display PTF apply information


    PTF                                               IPL
Opt  ID         Status                               Action
██   TL22321    Temporarily applied                  None
__   TL22104    Permanently applied                  None
__   RE22082    Permanently applied                  None
__   RE22025    Permanently applied                  None
__   MF99401    Permanently applied                  None
__   MF70511    Temporarily applied                  None
__   MF70508    Temporarily applied                  None
                                                              More...

F3=Exit    F11=Display alternate view    F17=Position to    F12=Cancel
```
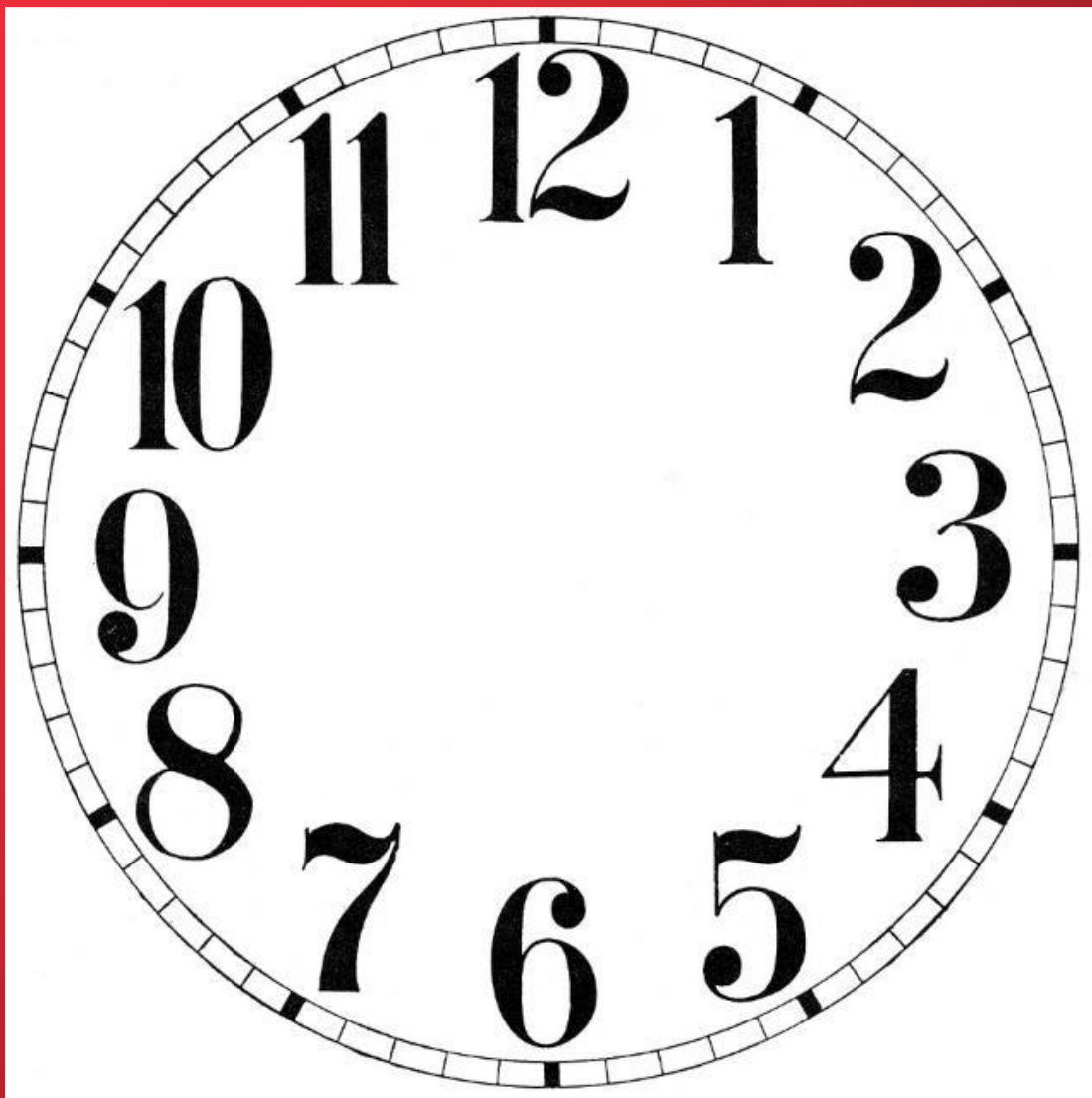
PTFs

- How Often Should You Apply?
- How often do you IPL
- Perm apply before loading new PTFs

Group PTFs - WRKPTFGRP

```
                           Work with PTF Groups
                                                        System:    ITECH75
     Type options, press Enter.
       1=Order    4=Delete    5=Display    6=Print    8=Display special handling PTFs
       9=Display related PTF groups      10=Display PTF apply information


     Opt   PTF Group           Level   Status
     █     SF99959               17    Installed
     ___   SF99959                9    Installed
     ___   SF99958               11    Installed
     ___   SF99958                6    Installed
     ___   SF99957                1    Installed
     ___   SF99955                3    Installed
     ___   SF99955                2    Installed
     ___   SF99954                5    Installed
     ___   SF99954                2    Installed
     ___   SF99953                2    Installed
     ___   SF99953                1    Installed
     ___   SF99952                4    Installed
     ___   SF99952                3    Installed
                                                              More...
     F3=Exit   F6=Print   F11=Display descriptions   F12=Cancel
     F22=Display entire field


     MA + A                                                     08/002
```

Group PTFs - WRKPTFGRP

Work with PTF Groups

                                                        System: ITECH75

Type options, press Enter.
  1=Order   4=Delete   5=Display   6=Print   8=Display special handling PTFs
  9=Display related PTF groups   10=Display PTF apply information

Opt   PTF Group   Text
█   SF99959   GROUP HIPER
___   SF99959   GROUP HIPER
___   SF99958   GROUP SECURITY
___   SF99958   GROUP SECURITY
___   SF99957   TECHNOLOGY REFRESH
___   SF99955   JAVA
___   SF99955   JAVA
___   SF99954   BACKUP RECOVERY SOLUTIONS
___   SF99954   BACKUP RECOVERY SOLUTIONS
___   SF99953   PERFORMANCE TOOLS
___   SF99953   PERFORMANCE TOOLS
___   SF99952   IBM HTTP SERVER FOR I
___   SF99952   IBM HTTP SERVER FOR I
                                                              More...

F3=Exit   F6=Print   F11=Display status   F12=Cancel
F22=Display entire field

MA + A   08/002

PTFs Display Firmware Status

```
                              Display Firmware Status
  _

  Service partition . . . . . . . . . . . . . . . . . :   Yes
  Firmware update policy . . . . . . . . . . . . . . :    *OPSYS
  Server IPL source . . . . . . . . . . . . . . . . . :   Temporary
  Firmware product ID/release . . . . . . . . . . . . :   5733909   V1R1M0
  Update access key expiration date . . . . . . . . . :   08/24/23
  Server IPL required . . . . . . . . . . . . . . . . :    No


                  --Server firmware--  -Operating system--
                  Fix         PTF      Fix         PTF       Update
  Copy            pack        ID       pack        ID        Status
  *ACTIVE         VL940_050   MH01849
                  FW940.10
  *TEMP           VL940_050   MH01849  *NONE       *NONE     None
                  FW940.10             *NONE
  *PERM           VL940_050   MH01849  *NONE       *NONE     None
                  FW940.10             *NONE
                                                                        Bottom


  Press Enter to continue


  F3=Exit    F5=Refresh    F12=Cancel    F14=Display firmware PTFs
```

Save Restore
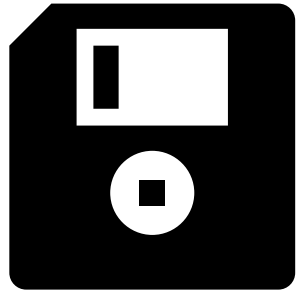
Your Recovery is only as good as your Backups
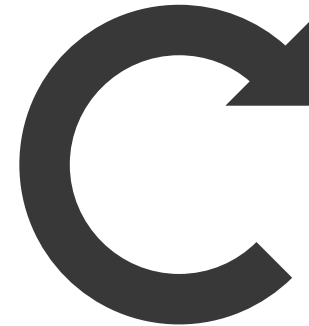
When did you last try a full system restore?

Console

- HMC or LAN Console
- System Console – In Controlling Subsystem
- Some Saves and Restores performed from here

```
                    Sign On
                                   System  .  .  .  .  .  :    HOSTP9
                                   Subsystem .  .  .  .  :    QCTL
                                   Display .  .  .  .  .  :    DSP01


User   .  .  .  .  .  .  .  .  .  .  .  .      _____
Password  .  .  .  .  .  .  .  .  .  .  .



Program/procedure  .  .  .  .  .  .  .  .      _____
Menu  .  .  .  .  .  .  .  .  .  .  .  .        _____
Current library  .  .  .  .  .  .  .  .  .      _____
```

Restricted State

From Console: ENDSBS SBS(*ALL) OPTION(*CNTRLD) DELAY(60)

```
                    Work with Active Jobs              ITECH75
                                          09/19/22  13:06:05 EDT
CPU %:   320.7    Elapsed time:    00:00:49    Active jobs:    42

Type options, press Enter.
  2=Change    3=Hold    4=End    5=Work with    6=Release    7=Display message
  8=Work with spooled files    13=Disconnect ...
                    Current
Opt  Subsystem/Job  User        Type  CPU %  Function      Status
___  QCTL           QSYS        SBS     .0                 END        ⟶
___    DSP01        ITECHSOL    INT    2.6   CMD-WRKACTJOB  RUN
___  QALERT         QSYS        SYS     .0                 DEQW
___  QCMNARB01      QSYS        SYS     .0                 EVTW
___  QCMNARB02      QSYS        SYS     .0                 EVTW
___  QCMNARB03      QSYS        SYS     .0                 EVTW
___  QDBFSTCCOL     QSYS        SYS     .0                 EVTW
___  QDBSRVXR       QSYS        SYS     .0                 CNDW
___  QDBSRVXR2      QSYS        SYS     .0                 CNDW
                                                                Mor
Parameters or command
===> _____
F3=Exit   F5=Refresh        F7=Find       F10=Restart statistics
```

```
                                              Display Messages
                                                     System:    ITECH09
Queue . . . . . . :    QSYSOPR        Program . . . . :    *DSPMSG
  Library . . . :       QSYS            Library . . . :
Severity . . . :      99              Delivery . . . :    *HOLD

Type reply (if required), press Enter.
_   Subsystem QSERVER ended.
    IBM Tivoli Directory Server instance QUSRDIR ended successfully.
    Job 032554/QDIRSRV/QUSRDIR completed normally on 10/05/19 at 16:23:59.
    Subsystem QSYSWRK ended.                                       ⟶
    Subsystem QHTTPSVR ended.
    System ended to restricted condition.
    TCP/IP is ending.
    IPv6 interface ended successfully.
    User QSYS in job 032448/QSYS/QTCPWRK ended TCP/IP *LOOPBACK interface
      127.0.0.1.
    User QSYS ended IP interface 172.29.6.3 on ETHLINE.
    A request to end TCP/IP has completed.
    TCP/IP is ending.
                                                              Bottom
```

Size of my system

```
                          Work with System Status                    ITECH75
                                                      09/19/22   13:09:49 EDT
% CPU used . . . . . . . . . :            1.8    Auxiliary storage:
Elapsed time . . . . . . . :          00:00:04     System ASP . . . . . . . :      572.6 G   ←
Jobs in system . . . . . :              137       % system ASP used  . . . :        9.9413
% perm addresses . . . . :              .007    Total  . . . . . . . . . :        572.6 G   ←
% temp addresses . . . . :              .007    Current temporary used :          3422 M
                                                Peak temporary used  . :          7068 M

Type changes (if allowed), press Enter.

System      Pool      Reserved      Max     -------DB-------  -----Non-DB-----
 Pool     Size (M)    Size (M)     Active   Faults     Pages  Faults     Pages
  1      ■1218.86      624.40      +++++       .0        .0      .0        .0
  2       2767.63        1.85         70       .0        .0     4.8      10.3

                                                                          Bottom
Command
===>  _____
F3=Exit    F4=Prompt    F5=Refresh    F9=Retrieve    F10=Restart    F12=Cancel
```

Userids

- IBM i QSECOFR password or equivalent userid/password
- DST/SST QSECOFR DST Password
- Other ids – Setting up Encryption or Encryption KeyStore

Tapes

- Number of tapes for backups
- Types of Tapes – Capacity & Speed
- How many Sets
- How do they move
- Where are they Stored
- Encryption
- Virtual Tape Libraries
- Tape Labels

Save Commands

- SAVSYS – Saves Licensed Internal Code, QSYS, Security and Configuration object. - Restricted

- SAVSECDTA – Saves all Security information - Unrestricted

- SAVCFG – Saves all configuration & System Resource management objects -Unrestricted

Save Library Commands

- SAVLIB – Can save one or more libraries. The special values for libraries are:
  - *NONSYS – All libraries (Except QDOC, QSPL, QTEMP, QRPLOBJ, QSYS) are saved. Must be restricted state.
  - *ALLUSR – All User Libraries are saved. Can be run without being in restricted state. All libraries that don't begin with Q are saved. None of the # System libraries are saved. Some Q libraries that contain "user data" are also saved ie QSYS2, QGPL, QUSRSYS, QMPGDATA, QPFRDATA, QS36F, QUSRBRM, and a few others.
  - *IBM – Saves the IBM libraries except those noted above, and can be run without being in restricted state.

Save Library Options

- Save Active -   Objects can be saved while others are writing to them. Various Checkpoint options (*SYSDFN, *LIB, or SYNCLIB).

- Save Access Paths – Can speed up backup and kill restore.

- Spool File Data – Default is *NO.

- ASP Device – Defaults to System ASP, basic ASPs (2-32), and all iASPs in the ASP Group. (Set your ASP Group if you have them).

Save Document Library Objects

SAVDLO – Saves a copy of the specified documents, folders, and distribution objects (mail). When specifying DLO(*ALL) FLR(*ANY) all document library objects are saved.

Save of the IFS

- Saves the Integrated File System.
- Sometimes forgotten.
- Omit /QDLS & /QSYS.LIB
- Devices specified as DEV('/QSYS.LIB/TAP01.DEVD')

- If you ever need to save to a *SAVF DEV('/QSYS.LIB/MYLIB.LIB/MYSAVF.FILE')
- ASYNCBRING(*YES)

Select one of the following:

    Save System and User Data
       20. Define save system and user data defaults
       21. Entire system
       22. System data only
       23. All user data

    Save Document Library Objects
       30. All documents, folders, and mail
       31. New and changed documents, new folders, all mail
       32. Documents and folders
       33. Mail only

                                                              More...

Selection or command
===> _____
    _____

Go Save Menu

21 – Save the entire System

```
                    Save the Entire System

What this option will do
  o   End all subsystems
  o   Save the Licensed Internal Code
  o   Save the operating system
  o   Save the security data
  o   Save the device configuration objects
  o   Save all user libraries (including libraries for licensed programs)
  o   Save all documents and folders
  o   Save all distribution and mail objects
  o   Save all directories
  o   Start the controlling subsystem

What this option will not do
  o   Save the contents of job queues or data queues that exist on the
      system
```

21 – Save the entire System

```
                     Specify Command Defaults


  Type choices, press Enter.


     Devices  . . . . . . . . . . .   TAP01         Names
                                       _____
                                       _____
                                       _____


     Prompt for commands  . . . . .   Y             Y=Yes, N=No

     Check for active files . . . .   Y             Y=Yes, N=No

     Message queue delivery . . . .   *BREAK        *BREAK, *NOTIFY

     Start time . . . . . . . . . .   *CURRENT      *CURRENT, time

     Start date . . . . . . . . . .   *CURRENT      *CURRENT, date

     Vary off network servers . . .   *ALL          *ALL, *NONE


                                                                 More...
```

21 – Save the entire System

Specify Command Defaults

Type choices, press Enter.

Unmount file systems . . . . . .   Y   Y=Yes, N=No

Print system information . . .   N   Y=Yes, N=No

Use system reply list . . . .   N   Y=Yes, N=No

Spooled file data . . . . . .   *NONE   *NONE, *ALL

End TCP/IP wait time   300   ←   *NONE, 1-9999 seconds

Print joblog . . . .   Y   Y=Yes, N=No

Start controlling subsystem   Y   Y=Yes, N=No

                                                                  Bottom

```
                        Work with Objects

Type options, press Enter.
  2=Edit authority          3=Copy    4=Delete    5=Display authority    7=Rename
  8=Display description    13=Change description


Opt   Object        Type      Library      Attribute    Text
___   QSAVALLUSR   *DTAARA    QSYS                      S/R DIRECTORY INFO FOR SAVE
___   QSAVCFG      *DTAARA    QSYS                      S/R DIRECTORY INFO FOR SAVE
___   QSAVIBM      *DTAARA    QSYS                      S/R DIRECTORY INFO FOR SAVE
___   QSAVLIBALL   *DTAARA    QSYS                      S/R DIRECTORY INFO FOR SAVE
___   QSAVSYS      *DTAARA    QSYS                      S/R DIRECTORY INFO FOR SAVE
___   QSAVUSRPRF   *DTAARA    QSYS                      S/R DIRECTORY INFO FOR REST
```

When did you last Save

When did you last Save

```
                        Display Object Description - Full
                                                                Library 1 of 1
Object . . . . . . . . :      QSAVSYS         Attribute  . . . . . :
  Library  . . . . . :         QSYS           Owner  . . . . . . . :      QSYS
Library ASP device . :       *SYSBAS          Library ASP group  . :      *SYSBAS
Type . . . . . . . . :        *DTAARA         Primary group  . . . :      *NONE

Journaling information:
  Currently journaled . . . . . . . . . :     NO
Save/Restore information:
  Save date/time . . . . . . . . . . . :      01/26/22  17:24:21
  Restore date/time  . . . . . . . . . :      08/17/22  19:33:50
  Save command . . . . . . . . . . . . :      SAVOBJ
  Device type  . . . . . . . . . . . . :      Optical
  Volumes  . . . . . . . . . . . . . . :      B_GROU
  File label ID  . . . . . . . . . . . :      /Q5770SS1/Q75000M

                                                                      Bottom
Press Enter to continue.

F3=Exit    F12=Cancel
```

67

Saves

- Daily, Weekly, Monthly – What's right?
- SAVCHGOBJ vs Full Library Save
- Save Files
- Update History
- Spool Files
- Journals, Journal Receivers, Physical files, and Logical files.

Restore

- Where are your tapes
- I_BASE_01   DVD or USB
- SAVSYS
- Encryption
- Console
- How long will it take
- System restore (Bare metal restore) or just a library

Managing your IBM i

File Shares

Who is using File Share

Function usage

Lockout & Control FTP usage

Lockout & Control FTP usage by Userid

Index Advisor

Index Advisor

Questions?

Petem592@gmail.com
PeteM@Peteandi.com

IBMCHAMPION