

Tips and Techniques :

i5/OS Administration

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Some Administrator's Concerns

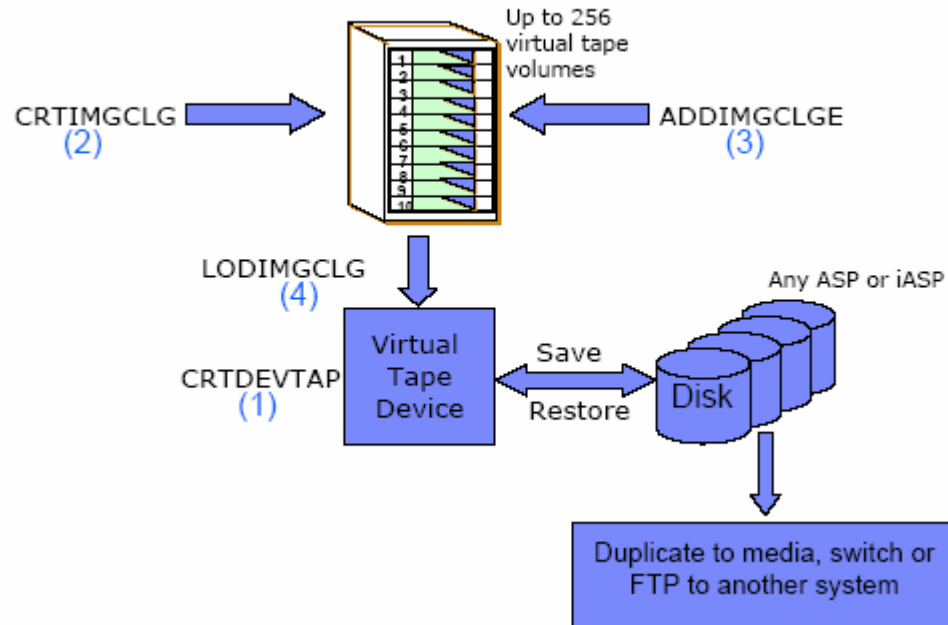
- Unattended / Remote Operations
 - Virtual Devices
 - Restricted State Operations
 - Installations
 - IPL codes and SRC
- FSP – HMC - Cache
- IFS / FTP Considerations
- Miscellaneous Tips
- Useful Sites

Useful for :

Installations

Save

Overview and Implementation



VIRTUAL TAPE

62.186.214.96 - Mocha W32 TN5250

File Edit View Settings Help

Open Close Copy Paste Print About Dup Clear Erase Attn Sysreq Help Hex

Work with Image Catalog Entries

System: MOD520

Catalog . . . : TAPVRT Status : Ready
Type : Tape Device : TAPVRT01
Directory . . : /tapvrt

Type options, press Enter.
1=Add 2=Change 4=Remove 6=Mount 8=Load 9=Unload
10=Initialize volume 11=Display 13=Dump 14=Duplicate

Opt	Index	Status	Volume Name	Density	Type	Write Protect
█	<u>*AVAIL</u>					
—	1	Unloaded	VOLPHA	*VRT256K	*SL	No
—	256	Mounted	VOLPHB	*VRT256K	*SL	No

Bottom

F3=Exit F5=Refresh F6=Load image catalog F8=Reorder by index
F11=View size information F12=Cancel F22=Display entire field

ONLINE 13,4

SAVSYS IN BATCH

SUBMIT ENDSBS IN BATCH PROGRAM

```
62.186.214.96 - Mocha W32 TN5250
File Edit View Settings Help
Open Close Copy Paste Print About Dup Clear Erase Attn Sysreq Help Hex

End Subsystem (ENDSBS)

Type choices, press Enter.

Subsystem . . . . . > *ALL          Name, *ALL
How to end . . . . . > *IMMED      *CNTRLD, *IMMED
Controlled end delay time . . . *NOLIMIT  Seconds, *NOLIMIT

Additional Parameters

End subsystem option . . . . . *DFT          *DFT, *NOJOBLOG, *CHGPTY...
+ for more values
Batch time limit . . . . .          5-9999 minutes, *NOMAX

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

ONLINE 5,37
```

- Specifies the amount of time (in minutes) that the system will run in batch restricted state. This parameter is only valid when ending all subsystems from a batch job running in the controlling subsystem. While the system is in this restricted state, system reference code A900 3C70 is displayed. If the specified time limit is reached, the batch job will be ended and the controlling subsystem restarted.

SAVSYS IN BATCH ON A VIRTUAL TAPE

SUBMIT PROGRAM IN BATCH

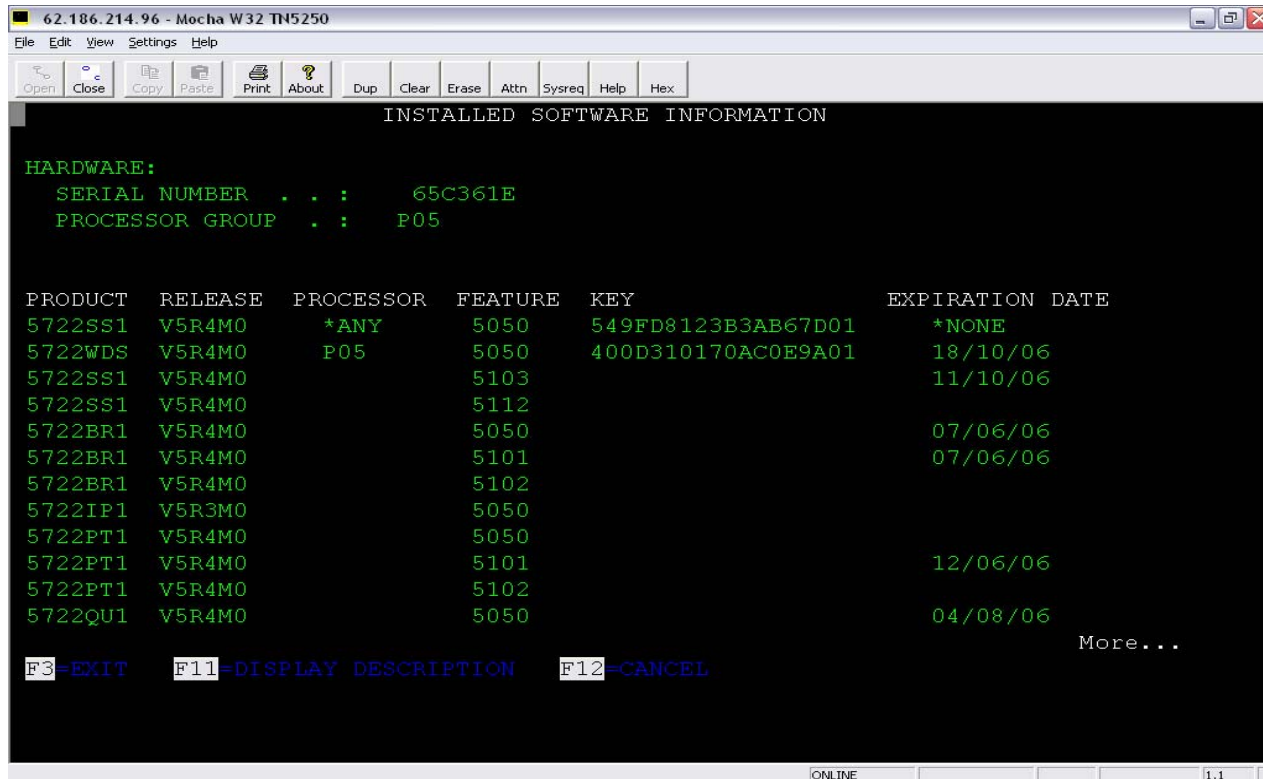
```
62.186.214.96 - Mocha W32 TN5250
File Edit View Settings Help
Open Close Copy Paste Print About Dup Clear Erase Attn Sysreq Help Hex
Columns . . . : 1 80 Browse QGPL/QCLSRC
SEU==> SAVSYSBCH
FMT ** ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
***** Beginning of data *****
0001.00 PGM 060908
0002.00 INZTAP DEV(TAPVRT01) NEWVOL(VOLPHB) CHECK(*NO) 060908
0003.00 MOMMSG CPF0000 060908
0004.00 ENDSBS SBS(*ALL) OPTION(*IMMED) BCHTIMLMT(60) 060908
0005.00 MOMMSG CPF0000 060908
0006.00 DLYJOB DLY(300) 060908
0007.00 SAVSYS DEV(TAPVRT01) VOL(VOLPHB) 060908
0008.00 MOMMSG CPF0000 060908
0009.00 STRSBS QCTL 060915
0010.00 MOMMSG CPF0000 060915
0011.00 ENDPGM 060908
***** End of data *****
F3=Exit F5=Refresh F9=Retrieve F10=Cursor F11=Toggle F12=Cancel
F16=Repeat find F24=More keys
(C) COPYRIGHT IBM CORP. 1981, 2005.
ONLINE 2,9
```

- Installation
 - GO LICPGM opt. 5
 - Check List
 - TCP/IP Information in QUSRSYS
 - QATOC* and QATM* files
 - MRGTCPHT (QUSRSYS/QATOCHOST.HOSTS)
- License Key information
 - POE
 - Electronic POE's
 - Can be retrieved via Internet

License Keys

TIP 1 : DISPLAY ALL IBM LICENSE KEYS

- CALL QSFWINV
- F11 TO DISPLAY THE KEYS



The screenshot shows a terminal window titled "62.186.214.96 - Mocha W32 TN5250". The window displays the following text:

```
INSTALLED SOFTWARE INFORMATION

HARDWARE:
SERIAL NUMBER . . : 65C361E
PROCESSOR GROUP . : P05

PRODUCT  RELEASE  PROCESSOR  FEATURE  KEY                EXPIRATION DATE
5722SS1  V5R4M0   *ANY      5050     549FD8123B3AB67D01 *NONE
5722WDS  V5R4M0   P05      5050     400D310170AC0E9A01 18/10/06
5722SS1  V5R4M0   .         5103     .                11/10/06
5722SS1  V5R4M0   .         5112     .                .
5722BR1  V5R4M0   .         5050     .                07/06/06
5722BR1  V5R4M0   .         5101     .                07/06/06
5722BR1  V5R4M0   .         5102     .                .
5722IP1  V5R3M0   .         5050     .                .
5722PT1  V5R4M0   .         5050     .                .
5722PT1  V5R4M0   .         5101     .                12/06/06
5722PT1  V5R4M0   .         5102     .                .
5722QU1  V5R4M0   .         5050     .                04/08/06

F3=EXIT  F11=DISPLAY DESCRIPTION  F12=CANCEL
```

At the bottom right of the terminal window, it says "More...".

End Of Life

<http://www-03.ibm.com/servers/eserver/support/iserie/planning/software/i5osschedule.html>

Release [‡]	End of support	Upgrade to V5R1	Upgrade to V5R2	Upgrade to V5R3	Upgrade to V5R4
V4R5	31 Dec 2002	Withdrawal date 21 Nov 2003	Withdrawal date 01 Oct 2005	-	-
V5R1	30 Sep 2005	-	Withdrawal date 01 Oct 2005	Withdrawal date to be announced	-
V5R2	30 Apr 2007	-	-	Withdrawal date to be announced	Withdrawal date to be announced
i5/OS V5R3	To be announced	-	-	-	Withdrawal date to be announced
i5/OS V5R4	To be announced	-	-	-	-

* Upgrades from previous software releases not shown in this table are no longer available. For more information, see Release life cycle.

- Troubleshoot the IPL process ?

just execute the program → CALL QWCCRTEC

- from the last IPL, it creates a spool file (QPSRVDMP) that list all the IPL SRC codes and duration for each IPL step.

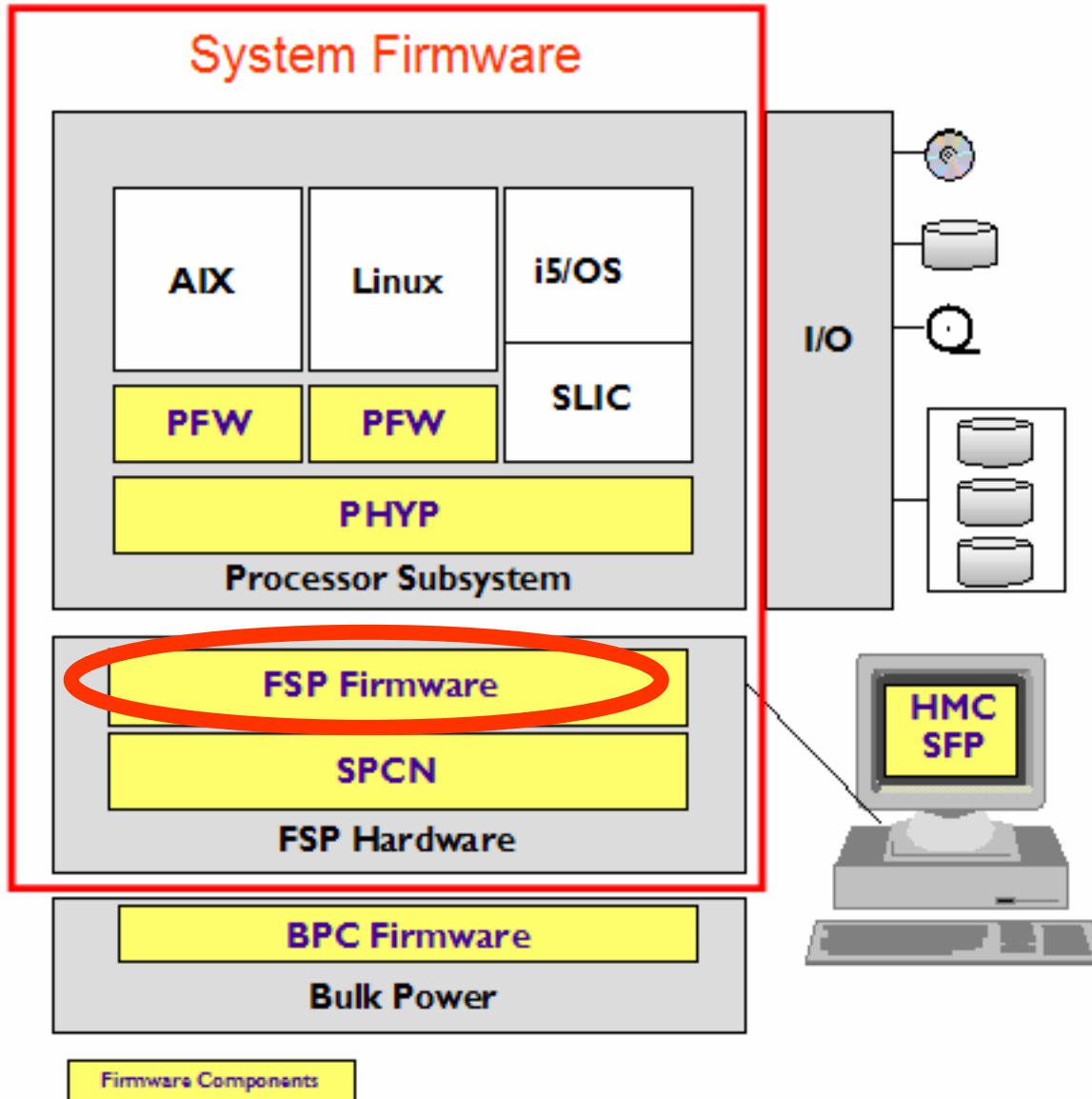
Example:

```
C900 2F00 09/10/06 16:28:00*  
End of IPL 09/10/06 16:28:00*
```

- Troubleshooting SRC codes

<http://www-03.ibm.com/servers/eserver/support/series/probsolv/src/index.html>

Not just LIC anymore



WARNING : INSTALL CUMPACK



WARNING : INSTALL CUMPACK

CROSS REFERENCE TABLE HMC ← → FIRMWARE FSP

<http://www14.software.ibm.com/webapp/set2/sas/f/power5cm3/supportedtable1.html>

POWER 5 system firmware levels (ISeries and pSeries)

HMC levels	240 Release	235 Release	230 Release	225 Release	222 Release	220 Release	210 Release
HMC V5R2: minimum HMC level required to support POWER5 release 240	<i>Supported HMC and system firmware combination.</i>	<i>Supported HMC and system firmware combination. FW Release covered under general FW support thru 10/2006</i>	<i>Supported HMC and system firmware combination. FW Release covered under general FW support thru 12/2006.</i>	Service Packs no longer provided.	Service Packs no longer provided.	Service Packs no longer provided.	Service Packs no longer provided.
HMC V5R1: minimum HMC level required to support POWER5 release 235	Not a supported combination.	Recommended and supported HMC and system firmware	<i>Supported HMC and system firmware combination. FW Release covered under general FW support thru 12/2006.</i>	Service Packs no longer provided.	Service Packs no longer provided.	Service Packs no longer provided.	Service Packs no longer provided.

WARNING : INSTALL CUMPACK

SERVER FIRMWARE AND HMC WIZARD V5R3

http://www-912.ibm.com/s_dir/slkbases/f0bc87f6aad37694862571560054636b/af803f7f108f42e7862571720050fbfe?OpenDocument

SERVER FIRMWARE AND HMC WIZARD V5R4

http://www-912.ibm.com/s_dir/slkbases/f0bc87f6aad37694862571560054636b/772540e94e73917786257172004f92d4?OpenDocument

WARNING : INSTALL CUMPACK

HOW TO VIEW CURRENT VERSION OF FIRMWARE INSTALLED

- STRSST
- Select option 1, START A SERVICE TOOL
- Select option 4, Display/Alter/Dump
- Select Option 2, for Licensed Internal Code Data
- Select Option 14, for Advanced Analysis
- Find FLASHLEVELS in the command list. Select it with an Option 1
- Press the Enter key enter on the options screen.
- Look for the MI Keyword associated with Load Source B.

WARNING : INSTALL CUMPACK

```
62.186.214.96 - Mocha W32 TN5250
File Edit View Settings Help
Open Close Copy Paste Print About Dup Clear Erase Attn Sysreq Help Hex
Display Formatted Data
Page/Line. . . 1 / 1
Columns. . . : 1 - 78
Find . . . . .
+...+...1...+...2...+...3...+...4...+...5...+...6...+...7...+...
DISPLAY/ALTER/DUMP
Running macro: FLASHLEVELS

LS Flash Sync Enabled.
OS MANAGED
Base Level:

Side          Date/Time      MI Keyword    PTFs (V5R4M0)
-----
Memory        20051221/1022 SF235_185     MH00519
Flash P       20051221/1022 SF235_185     MH00519
Flash T       20051221/1022 SF235_185     MH00519
Load Source A 20051202/1310 SF235_180     MH00506
Load Source B 20051221/1022 SF235_185     MH00519

Bottom

F2=Find  F3=Exit  F4=Top  F5=Bottom  F10=Right  F12=Cancel
Print operation complete to the default printer device file.
ONLINE  X - HELP  19,35
```

WARNING : INSTALL CUMPACK

HOW TO CHECK IF CUMPACK CONTAINS NEW FIRMWARE PTF

http://www-912.ibm.com/s_dir/slkbase.nsf/fixesbynumber/373869955

If you know what level server firmware is required for your system, follow the table below:

Important Information: For servers with a Hardware Management Console (HMC), the HMC code should be current prior to applying server firmware. For the latest HMC information refer to the following Web site: <http://techsupport.services.ibm.com/server/hmc>

This document applies to operating systems that have the Firmware Update Policy set to Operating System or systems not managed by an HMC. The server firmware information in this document does not apply to Model 595 systems (because Model 595 systems must have the Firmware Update Policy set to HMC-managed). Server firmware fixes are ordered (using the **SNDPTFORD** command or Fix Central) and installed as PTFs using operating system PTF installation functions. These PTFs have a prefix of MH and are ordered using the Marker PTF (including requisites):

VSR3M0

Date Added	Marker PTF	Release_Level	Description	Order PTF
05/30/2006	MH00678	SF240_219	SF240 fix pack.	Go
01/17/2006	MH00517	SF235_185	SF235 fix pack.	Go

VSR3M5

Date Added	Marker PTF	Release_Level	Description	Order PTF
05/30/2006	MH00676	SF240_219	SF240 fix pack.	Go
01/17/2006	MH00518	SF235_185	SF235 fix pack.	Go

Important Information
This document applies to operating system that have the Firmware Update Policy set to Operating System or systems not managed by an HMC. Cumulative PTF packages and the HIPER Group package contain server firmware fixes as they become available.

Installation / Upgrade Considerations
For additional information, refer to the following IBM Support Center Direct documents:

348607919, [iSeries Recommended Fixes - Server Firmware: Update Policy Set to HMC:](#)
373803227, [iSeries Recommended Fixes - HMC Code Updates:](#)

WARNING : INSTALL CUMPACK

IBM System i Support: PTF Cover Letter: MH00518 - Microsoft Internet Explorer provided by Tiscali

Address: http://www-912.ibm.com/a_dir/as4ptf.nsf/a18db68aae4a7d81862566ba005d145c/aec8974c0ead6803862570f300632e58?OpenDocument&Highlight=2,mh00518

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← System i

Support

Technical databases

- APARs
- Preventive Service Planning - PSP
- PTF Cover Letters
- Software Knowledge Base
- Registered Software Knowledge Base

Related links

- Register
- Feedback

PTF#:	MH00518 - Licensed Internal Code
Licensed Program:	5722999
APAR Fixed:	View details for APAR MB01296
Release:	535
Cumulative Level:	C6045535
Superseded by:	View fix details for PTF MH00819

[Add to my download list](#) [View my download list](#)

[Order fixes in download list](#)

Abstract

Marker for Fix Pack 01SF235_185_160

Pre/Co-Requisite PTF / Fix List

REQ TYPE	LICENSED PROGRAM	REL	PTF/FIX NUMBER	LEVEL MIN/MAX	OPTION
CO	5722999	535	MH00524	00/00	0000
CO	5722999	535	MH00529	00/00	0000
CO	5722999	535	MH00527	00/00	0000
DIST	5722999	535	MF37131	00/00	0000

NOTICE:

Application of this PTF may disable or render ineffective programs that

Battery Monitoring

- Check the disk controller card batteries expiration:

STRSST to start system service tools.

Option 1 – start service tool

Option 4 – display/Alter/Dump

Option 1 – display/Alter storage

Option 2 – LIC data

Option 14 – advanced analysis

then select BATTERYINFO in options line:

–INFO –ALL

Battery Information

BATTERY INFORMATION FOR RESOURCES THAT HAVE CACHE

Battery Life Information for Resource DC07

Serial Number : 53-1025698

IOA Type-Model : 2748-001

Frame ID - Card Position : 3 -C04

Battery type : Nickel Cadmium (NiCd)

Battery State. : No battery warning/error was issued

Power on Time (days) : 34

Adjusted Power on Time (days). : 34

Estimated time to warning (days) . . . : 877

Estimated time to error (days) . . . : 969

Concurrently maintainable battery pack : No

Battery pack can be safely replaced. . : No

- An easier and more powerful way to manage the IFS:
 - just use the DSPF/EDTF commands
specifying an IFS directory name.
 - command DSPF STMF('/QIBM')
 - a new display, more user friendly, will be shown
- Easy way to display a user space content:

DSPF

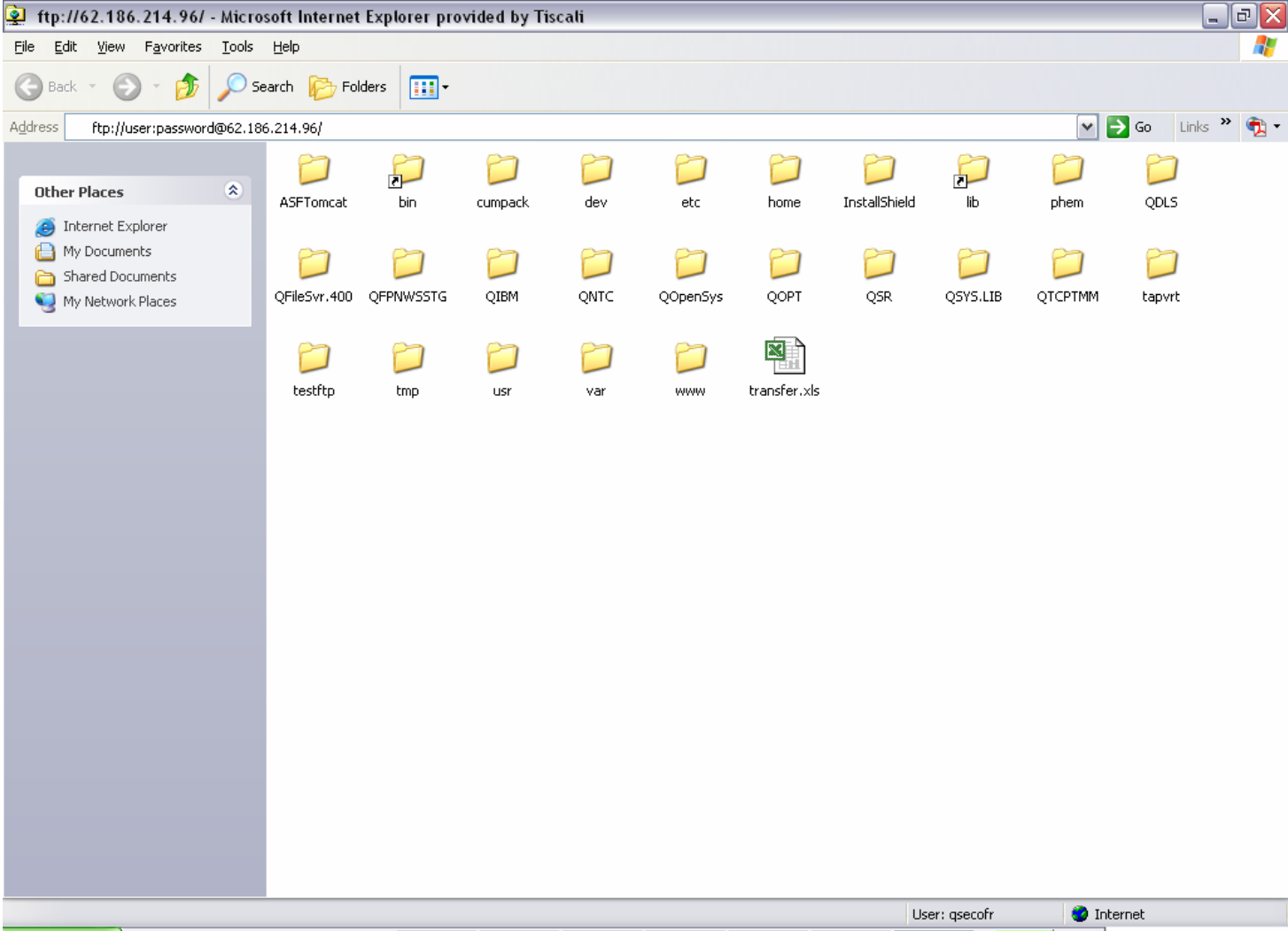
**STMF('/QSYS.LIB/"LibName".LIB/"UserSpaceName".USRS
PC')**

IFS VIEW VIA BROWSER

- Create a directory in the IFS
`MD '/TESTFTP'`
- Change your home directory of your userprofile to this directory
`CHGUSRPRF USRPRF(TEST) HOMEDIR('/TESTFTP')`
- Change the FTP attributes of the server
`CHGFTP NAMEFMT(*PATH) CURDIR(*HOMEDIR)
LISTFMT(*UNIX)`
- Enter in the Internet Explorer address bar :
`ftp://userprofile:password@62.186.214.96`
the userprofile and password are separated by a colon

!!! We have changed the original namefmt. Existing scripts may need an other namefmt !!!

FTP SERVER TO VIEW IFS



Right-click on a file and select "Copy to folder" to transfer the file via FTP to your PC

FTP To View Profiles

- **Create a link to qsys.lib**

```
ftp> quote site namefmt 1
ftp> quote site namelist 1
ftp> cd /
```

If QSH installed

```
ftp> quote rcmd QSH cmd('ln -fs /qsys.lib /myqsyslib')
```

Or with ADDLNK command

```
ftp> quote rcmd ADDLNK OBJ('/qsys.lib') NEWLNK('/myqsyslib')
```

- **List users**

```
ftp> dir /myqsyslib/*.usrprf
ftp>
```

```
ftp> dir /myqsyslib/*.usrprf
```

200 PORT subcommand request successful.

125 List started.

```
-rwx--r-x  1 QSECOFR  0    90112 Aug 15 10:42 ANNE.USRPRF
-rwx----- 1 ANNE      0    90113 Sep 19 09:48 AUDIT.USRPRF
-rwx----- 1 QSECOFR  0    90113 Sep 17 11:35 DUPOND.USRPRF
-rwx----- 1 ANNE      0    90113 Sep 20 15:48 DURAND.USRPRF
-rwx----- 1 QSECOFR  0    90112 Sep 01 09:27 GRPFTP.USRPRF
-rwx----- 1 QSECOFR  0    90112 Aug 16 13:33 GRPFTPUSER.USRPRF
-rwx----- 1 QSECOFR  0    90112 Aug 16 15:58 GRPTST.USRPRF
-rwx----- 1 QSECOFR  0    90112 Aug 16 13:32 GRPUSERF.USRPRF
-rwx----- 1 QSECOFR  0    90112 Aug 16 15:59 GRPUSER2.USRPRF
```

You can see that profile ANNE have *public authorities read and execute (r-x), also that her last connection was on september the 18th. ANNE have also certainly the righ enough to create user profile, She has create profiles AUDIT and DURAND. With a system value QSECURITY level 30, you are able to submit a remote command and using ANNE as user to create profile.

Exit program Attack FTP 1/2

- **List or get file « unauthorized » !**

Your security exit program policies allow users to access any files from their own folder, and the rest of the disk is locked.

```
ftp>pwd
```

```
257 « /home/ludo » is current directory
```

```
ftp> get /mysecurefolder/file.txt
```

```
550 request rejected
```

This is normal you've locked this folder, which is not my own folder, with exit point

```
ftp> get /home/ludo/../../mysecurefolder/file.txt
```

```
200 PORT subcommand request successfully
```

```
150 retrieving file
```

```
/home/ludo/../../mysecurefolder/file.txt
```

```
250 File transfer completed successfully
```

```
ftp> get /home/ludo/../../qsys.lib/qgpl.lib/otherfile.file
```

```
200 PORT subcommand request successfully
```

```
150 retrieving file
```

```
/home/ludo/../../qsys.lib/qgpl.lib/otherfile.file
```

```
250 File transfer completed successfully
```

To avoid this situation, you have to prevent usage of « ../ » in the FTP command.

Exit program Attack FTP 2/2

- **Symbolic link support**

I can create a symbolic link in my personal folder

```
ftp>pwd
```

```
257 « /home/ludo » is current directory
```

```
ftp>quote site listfmt 1
```

```
250 Directory listing format (LISTFMT) option set to 1
```

```
ftp> quote rcmd QSH('ln -fs /qsys.lib /home/ludo/myqsyslib')
```

```
250 command QSH CMD(('ln -fs /qsys.lib /home/ludo/myqsyslib') successfull
```

```
ftp> dir /myqsyslib/*.usrprf
```

Give you the list of user profiles in your system.
This link also give You access to any library

To avoid this situation, you have to prevent or limit usage of symbolic link.

- How to start security auditing with one command:
...without creating journal receiver, journal and changing system values !

just use the command CHGSECAUD:

```
CHGSECAUD    QAUDCTL(*OBJAUD *AUDLVL)  
              QAUDLVL(*AUTFAIL *OBJMGT)
```

journal QAUDJRN and its initial journal receiver are created by this command.

COPY A SPOOLED FILE

- SNDTCPSPLF RMTSYS(LOCALHOST)
PRTQ(QDKT)
FILE(QPQXPRTF)
JOB(008780/QSECOFR/QPADEV0002)
SPLNBR(14)
DESTTYP(*AS400)
TRANSFORM(*NO)
DLTSPLF(*NO)

The trick here is the LOCALHOST system, which is the local System i (loopback IP address 127.0.0.1).

You send the spooled file to the same system, but to another output queue.

Replies to *SYSOPR

- Find reply to a message in QSYSOPR:

**DSPMSG MSGQ(QSYSOPR) OUTPUT(*PRINT)
MSGTYPE(*INQ)**

and search the spool file:

CPA0701 99 INQUIRY CPF7302 received by DTR010L at 1700. (C D I R)

DTR010L DELEHOV 086310 QCLXERR 0000 12/09/06 15:23:19.444328

99 VALID RPY Reply . . : R

QPADEV005K DELEHOV 086104 QMHSCVLV 0000 12/09/06 15:23:45.673680

System Request

- Replace system request option 3 (DSPJOB) to get a command line:

use WRKMSGD CPX2313 then option 2 to change the message ID.

replace the word DSPJOB by WRKJOB in the “first level message” field.

now try system request key + 3 to get the command line

- Verify automatic cleanup setup:

CHGCLNUP + F4

```
Allow cleanup . . . . . *YES
Time cleanup starts each day . . '02:00:01'
```

Number of days to keep:

```
User messages . . . . . 7
System and workstation msgs . 7
Job logs and system output . . 7
System journals and logs . . . 30
```

Set it to *YES and select “number of days to keep” values

i5 System Cleanup

- Cleanup old history files:

```
WRKOBJ OBJ(QSYS/QHST*) OBJTYPE(*FILE)
```

Select old files to delete:

File	Text
QHST 06242A	10608300728181060831233217
Year 2006	yymmdd hhmmss yymmdd hhmmss
Day 242	Start date time / end date time

i5 System Cleanup

- Cleanup journal receivers:
 - command DSPOBJD OBJ(*ALL) OBJTYPE(*JRNRCV) to track big receivers.
 - command WRKJRNRCV JRNRCV(*ALL/*ALL) then option 5 to display the status – saved/on-line/attached option 4 to delete – attached rcv cannot be deleted
- Delete unnecessary IBM Licensed Programs:

i5 System Cleanup

- Cleanup system OUTQs QEZDEBUG and QEZJOBLOG:
CLROUTQ OUTQ("outq name")
- Reclaim unused storage for spooled files:
submit the command RCLSPLSTG DAYS(*NONE)
*NONE = All unused spool storage is deleted.
- Cleanup all performance data:
CLRLIB LIB(QPFRDATA) and CLRLIB(QMPGDATA)
No collection services must be running.

i5 System Cleanup

- Cleanup old problem entries:

command `DLTPRB DAYS(30)`

DAYS = number of days until problem deletion

or set correctly the related sysval:

QPRBHLDITV Problem log hold interval

- Delete old PTFs save files:

`WRKOBJ OBJ(QGPL/"PTF type")` then option 4 to delete.

PTF type values = QMF* , QSF* , QMH* or QSI*

- Cleanup old main storage dumps copies:
STRSST to start system service tools
then OPTION 1 – start a service tool
 OPTION 6 – main storage dump manager
 OPTION 2 – work with copies of m.stg.dump
 OPTION 4 – to delete.

Temporary Storage

- Download the tool from the Internet :

<http://www-1.ibm.com/support/docview.wss?uid=nas198da59ac32c4b60e86256e2c00000e35&rs=110>

- CALL PGM(QTSTGPGM) PARM(x z)
 - X : minimum temporary storage space used
 - Z : batch jobs (i for interactive jobs)
- Example :
 - CALL PGM(QTSTGPGM) PARM(32 b)
 - > messages are created in QSYSOPR

Other cleanup tips...

- RGZPFM
- RCLSTG
- Space objects : Storage Spaces, User Spaces,...
- SAVF
- IFS (ex: virtual install images,...)
-

Useful Sites for Support

- General Support :

<http://www-03.ibm.com/servers/eserver/support/series/>

<http://www.google.com>

- Information Center

<http://publib.boulder.ibm.com/infocenter/eserver/v1r3s/index.jsp>

- Recommended Fixes

http://www-912.ibm.com/s_dir/slkbases/recommendedfixes