



Managing your IBM i PTFs

Gateway400 Users Group

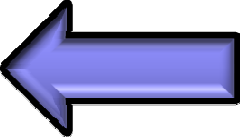
October 10, 2013



Larry "DrFranken" Bolhuis
Frankeni Technology Consulting, LLC
Middleville, MI.



Agenda

- What is a PTF? 
- What to PTF
- PTF Stati and Life Cycle
- PTF Groups
- To PTF or not to PTF
- Fix Central
- Load and Apply
- Customize Defaults and using Virtual Media



PTFs: a Quick Review

- PTF or 'Program Temporary Fixes' are updates provided by IBM to correct problems or add new function.
 - New function may be software capabilities or support for new hardware
- PTFs are specific to a given release
 - They may be created for multiple release
 - The PTF for each release will have a different number.
- They can be handled one at a time or in groups.
- Getting PTFs requires either IBM Hardware maintenance or a current software maintenance contract.



PTF Packaging

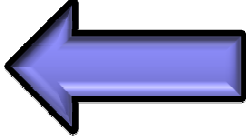
- An individual PTF can contain more than one object.
 - Application of the PTF may replace multiple objects
 - It may add objects to the system
 - It may remediate a problem by running a program
- The package also contains a cover letter. Once loaded PTF Cover letters live in the QAPZCOVER file in the QGPL library.
 - Each cover letter is it's own member with the same name as the PTFs number but preceded with the letter 'Q'.
 - If new function is provided the cover letter will describe how to enable this function.
- If loaded separately the package is a save file in library QGPL.
 - The name is the same as the Cover letter.



Temporary and Permanent

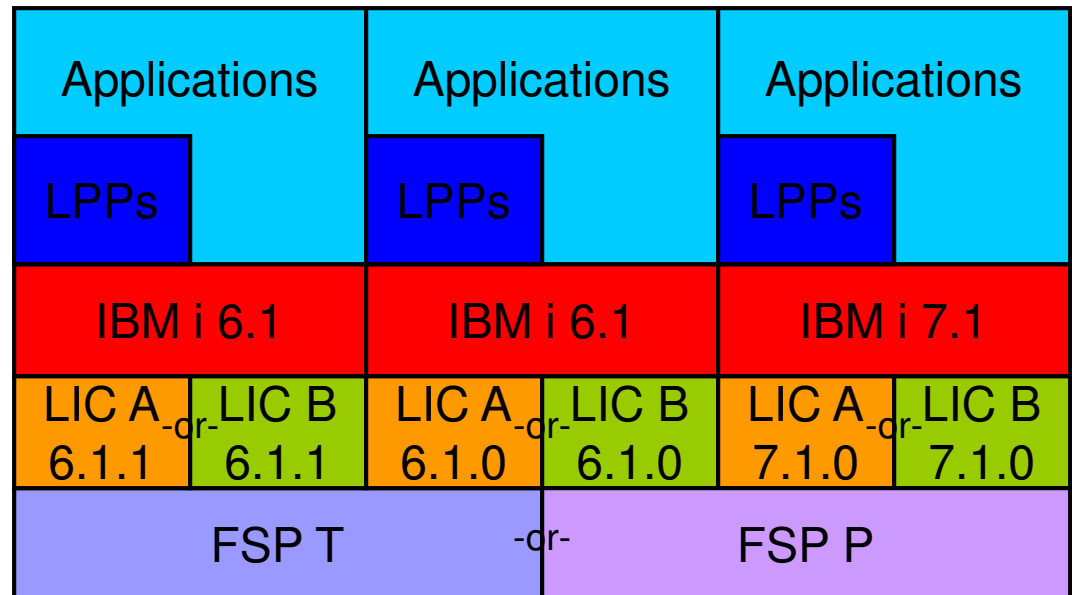
- The seemingly obvious distinction between Temp and Perm is that a temporarily applied PTF can be removed, or 'UnApplied'.
- A PTF that is permanently applied may be removed in only two ways.
 - Restore the system to a point prior to the PTFs application.
 - Get a new PTF from IBM that 'undoes' the PTF that needs to be uninstalled
 - This only occurs with defective PTFs
- Prerequisite and co requisite PTFs
 - These are VERY often found when applying PTFs.
 - Note that if a PTF is being permanently applied the Pre-req PTFs also must be permanently applied

Agenda

- What is a PTF?
- What to PTF 
- PTF Stati and Life Cycle
- PTF Groups
- To PTF or not to PTF
- Fix Central
- Load and Apply
- Customize Defaults and using Virtual Media

Code Bases

- In order to understand PTF application we must understand the three code bases of the system.
- From the top down:
 - IBM i and the Licensed Program Products (LPPs).
 - Licensed Internal Code (LIC)
 - System firmware in the FSP





IBM i and LPPs

- When a PTF is temporarily applied the objects being updated are first copied to a holding space and then the new pieces are put in their place.
- Removing a temporarily applied PTF reverses this process by putting the saved objects back in place.
- Permanently applying a PTF deletes all the saved objects and frees up the disk space consumed by those saved objects.
- When IBM i IPLs any PTF applied perm or temp in this space *will* be active.



Licensed Internal Code (LIC)

- There are two copies of the LIC on every system “A” and “B”
 - The “A side” has only Permanently applied PTFs
 - The “B side” has both Permanently and Temporarily applied PTFs
- When a LIC PTF is temporarily applied it is applied to the “B” side only.
- Removing a temporarily applied PTF removes it from the “B” side.
- Permanently applying a PTF copies the PTF to the “A” side.
- Any partition can be restarted from either “A” or “B” sides.
 - If a temp applied LIC PTF causes trouble the system can be restarted from the “A” side
 - Once on the “A” side temporarily applied LIC PTFs can then be removed.
- If all LIC PTFs are applied Permanent then “A” and “B” are the same and the system will IPL normally IPL from the “A” side.



System Firmware

- There are two copies of the FSP code on every i5 system, Temporary (“T”) and Permanent (“P”)
 - The “P” side contains the ‘Accepted’ code level.
 - The “T” side contains the ‘Activated’ code level.
 - It’s also possible to have an ‘Installed’ level that will become the Activated level at the next deep IPL.
 - Deep IPL is when the FSP IPLs.
 - This requires ALL partitions to be shut down.
- Similar to applying LIC PTFs Permanently the ‘Accept’ function copies the Activated level to the “P” side
- Also similar to permanently applied PTFs the Accepted code level cannot be removed.
- Note that for systems without an HMC the “T” and “P” sides are always kept in sync.



PTF Numbering

PTFs are identified with seven character identifiers formatted as “XXnnnnn”

- XX is one of the following letter pairs:
 - SF
 - In releases prior to V5 all OS/400 and LPP PTFs began with the letters SF.
 - Now SF PTFs are only used for group PTFs.
 - SI
 - All IBM i and LPP PTFs now begin with SI
 - MF
 - All LIC PTFs begin with letters MF
 - MH
 - These PTFs are FSP code.
 - These exists even on non i5 systems.
 - These are applied only from a Service Partition.
 - RE
 - These indicated the various REsave levels present.
 - IBM periodically creates new LIC media and each gets an RE
 - www-947.ibm.com/systems/support/i/planning/resave/index.html
 - TL (999) and TC/TA (SS1)
 - These are markers for the CUMEs present.
 - The TC PTF carries the cover letter for the CUME package.



Meaningful PTF Numbers

- Most PTF numbers don't mean anything.
- Numbers for MF and SI PTFs are given out in order as needed so other than 'relative' age they mean nothing.
- Due to multiple releases being supported concurrently the numbers for multiple releases interleave.
- The SF numbers designating group PTFs are static as well
- The TL/TC/TA marker PTFs indicate the dates of cumulative PTF packages installed. These are formatted TLYYJJJ.
 - YY is the last two digits of the year
 - JJJ is the Julian date
- RE markers use the same YYJJJ format

DSPPTF

System Release

LIC Copy in use

FSP Code in use (Only for 1 Partition POWER Systems)

PTF Status

Pending IPL Action

```
Display PTF Status
System: V7R1PROD
Product ID . . . . . 5770999
IPL source . . . . . : ##MACH## ##SERV#T
Release of base option . . . . . : V7R1M0 L00

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

Opt  PTF ID      Status
--  --
  _  TLP0016  Temporarily applied
  _  TLP0015  Superseded
  _  TLP0014  Superseded
  _  TLP0013  Superseded
  _  TLP0012  Superseded
  _  TLP0011  Superseded
  _  TLP0010  Superseded
  _  TLP0009  Superseded

IPL Action
None
None
None
None
None
None
None
None
None

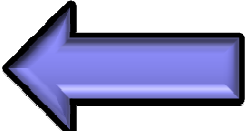
More...
```



Cover Letters

- PTFs each have cover letters
 - Individual cover letters can be displayed in 2 ways
 - DSPPTF LICPGM(5770SS1) SELECT(TC11116)
COVERONLY(*YES)
 - DSPPTFCVR LICPGM(5770SS1) SELECT(TC11116)
 - View all cover letters with special instructions
 - DSPPTFCVR LICPGM(5770SS1) SELECT(*ALL)
CVRATR(*SPCINST)
 - View all unapplied cover letters with special instructions
 - DSPPTFCVR LICPGM(5770SS1) SELECT(*NOTAPY)
CVRATR(*SPCINST)
 - CVRATR has five options:
 - *SPCINST, *PREIMM, *PREDLY, *PREOPR, *POSTOPR

Agenda

- What is a PTF?
- What to PTF
- PTF Stati and Life Cycle 
- PTF Groups
- To PTF or not to PTF
- Fix Central
- Load and Apply
- Customize Defaults and using Virtual Media



The 21 stati*i* of PTFs

- **On order.** The PTF is ordered from IBM, but not yet on the system.
- **Not applied.** The PTF has been loaded on the system, but is not applied and is not in use. A PTF in this state may also have been temporarily applied and then temporarily removed.
- **Save file only.** The PTF exists on the system in a save file, but has not been loaded or applied yet.
- **Not applied-IPL.** The PTF is loaded, but will not be applied until the next IPL.
- **Temporarily applied.** The PTF is temporarily applied and is active. It can be temporarily removed or permanently applied from this state.
- **Permanently applied.** The PTF is a permanent part of the system and cannot be removed.
- **Temporarily removed.** The PTF has been temporarily removed from the system.
- **Superseded.** The PTF is no longer on the system because it has been replaced by at least one subsequent PTF.
- **Damaged.** The PTF is damaged and must be loaded again in order to correct the damaged condition.



PTF stati continued

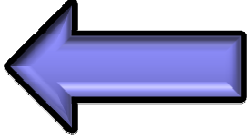
- OK that wasn't all of them but the rest are quite rare indeed.
- There is no status of permanently removed because in that case the PTF is completely gone.
- Note that PTFs with these modifiers that have *almost* reached their new stati:
 - **IPL**. An IPL is required to complete the action.
 - **PND (pending)**. Some action is required (see the PTF's cover letter for the specific action to take). The action is updated when the PTF's status is displayed.
 - **ACN (action)**. Some action is required (see the PTF's cover letter for the specific action to take). This modifier can be removed from the PTF if the action is taken, or the modifier will be cleared at the next IPL



PTF Life Cycle

- **On Order** until it exists on the system.
- **Save file only** if it was ordered via Electronic Customer Support (ECS). (Often PTFs will never show a Save file only status.)
- **Not applied** state when it is loaded, but not yet applied.
- **Not applied-IPL** state when it is loaded and set to apply at IPL
 - Many PTFs will never show this status because they are applied immediately.
- Most remain **Temporarily applied** for a long time, however, some PTFs go directly to **Permanently applied** (many of these are LIC PTFs).
- PTFs that have been **Temporarily applied** for some time (usually long enough to prove that they aren't defective) are usually **Permanently Applied** to save disk space.
- PTFs are eventually **Superseded** by another PTF with newer code. Once the newer PTF is applied, the older PTF is flagged as **Superseded**.
 - The reason the PTF identifier remains on the system is because there is code that will check for a particular PTF (as a prerequisite or co-requisite for another PTF), and that code must find the prerequisite PTF it requires before it will load another on the system.

Agenda

- What is a PTF?
- What to PTF
- PTF Stati and Life Cycle
- PTF Groups 
- To PTF or not to PTF
- Fix Central
- Load and Apply
- Customize Defaults and using Virtual Media



PTF Groupings

- **Single PTFs.**

- A single PTF may be ordered to correct a specific problem, or to add a new function that didn't exist when the release first became available. Any number of single PTFs can be ordered at one time

- **Service packs** are single PTFs that are installed on IBM i, but update the PC code residing in the IFS.

- Currently service packs target IBM i Access and Windows Server Integration code

- **Cumulative PTF Packages** or CUMes

- CUMes contain fixes for all parts of IBM i.
- These accumulate from the time the latest version of the operating system is released.
- Once a PTF has been placed on a CUMe, it will be on every further CUMe unless it is superseded by another, or marked defective.
- When you order a CUMe you also get the current Database and HIPER PTF groups with your order.
- Cumulative packages are heavily tested. That is, systems with these PTF levels are run through multiple tests to assure that the PTFs all work together. A CUMe has the highest level of testing, and the lowest level of risk for your system.



PTF Groups

- **HIPER group - High-Impact PERvasive,**
- **Security (Only Security PTFs from HIPER group)**
- **Database (DB)**
- **JAVA**
- **HTTP**
- **TCP/IP**
- **Backup and Recovery group.**
- **Performance Tools**
- **IBM i integration with Blade and System x**
- **Websphere (Several versions)**
- **Web Query (Several versions)**
- **Technology Refresh (New in 7.1)**
- **Hardware (New in 2012)**



PTF Groupings

- **HIPER group - High-Impact PERvasive,**
 - There are two types of HIPERs.
 - High-impact - resolves a potentially serious problem. They often contain phrases like “Requiring an IPL to recover” or “data loss may occur.”
 - Pervasive - may not fix a large problem, but one that impacts most System *i* users—so it’s important to implement quickly.
 - This group is generally collection HIPERs available from the date that the release became generally available.
 - At some points, however IBM decides that the HIPER group is no longer cumulative. The assumption is that you have applied a base CUMEs so there is no longer a need for the HIPER to be cumulative.
 - In practice, this isn’t a problem, but could be an issue if you don’t understand this process.
 - HIPER groups are the most frequently updated group of PTFs in any release.
 - V5R3 reached HIPER level 169 **and that’s the end of the line.**
 - V5R4 currently at HIPER level **169.**
 - V6R1 currently at HIPER level **117.**
 - V7R1 currently at HIPER level **57.**
 - The HIPER group is included in the CUME group.



PTF Groupings

■ Database (DB) group.

- Because the majority of IBM i systems do a significant amount of database work this is the second most popular group.
- As the name implies, the database group contains PTFs that effect the database functions of the system.
- It is updated periodically, though not as frequently as the HIPER group.
- The DB Group is included in the CUMe group and the Websphere groups.
- V7R1 group 7, V6R1 group 19, V5R4 group 30, V5R3 group 24.

■ JAVA group.

- This group is important because of the amount of Java running on the system.
- Applications like Websphere and System i Access Management Central use JAVA extensively.
- This group is included in the Websphere group



PTF Groupings

■ HTTP group.

- This group updates the HTTP server code, and is also updated nearly as often as the DB and JAVA groups.
- Since every IBM i system runs web servers these days this group should be on most peoples list

■ TCP/IP group.

- This group updates TCP/IP communications code. Like the HTTP group every IBM i runs TCP/IP so this is important as well.

■ Service Agent group.

- This group is updated more often than all but the HIPER group.
 - This group updates the code that IBM uses to watch your system for inappropriate activities, problems, etc. If you want to keep your system running smoothly, then this is another group to consider.
- Folded into the HIPER and other groups in 2009, no longer available.



PTF Groupings

- **Backup and Recovery group.**

- This group is largely targeted at Backup and Recovery Media Services (BRMS) users.
- On top of providing BRMS PTFs, it updates save and restore functions on the system.

- **Performance Tools group.**

- This group disappeared after V5R3.
- And then.... Reappeared in 2010.
- Not a lot in there these days however.

- **IBM i integration with bladecenter**

- If you're using integrated X in any way, get this.
- This also includes the JAVA group.



PTF Groupings

■ **Security Group.**

- This is a new group that appeared in 2008.
- It is available for V5R4, 6.1 and 7.1.
- This group is a subset of the HIPER group.
- It was created for shops who do not want to do entire HIPER groups but still need Security PTFs.
- This group is now released bi-weekly with Hipers unless no HIPER ptf's qualify as 'Security' so it will not stay in-sync.

■ **Websphere groups.**

- There are versions of this group for every supported Websphere on IBM i release—I'm not going to list them all. For example, in V5R3, there are currently 12 different Websphere groups available!
- The Websphere groups include the DB, HTTP and JAVA groups as well.



Coollest Group

- Technology Refresh for 7.1 (SF99707)
 - This group brings LIC for new hardware and firmware function.
 - Group level 1 adds support for:
 - Power 710 Express and Power 730 Express 2U servers
 - Power 720 Express and Power 740 Express 4U servers
 - Power 795 enterprise server
 - In addition many specific features including:
 - Quad GbE HEA, Dual 10GbE HEA Fiber and Copper
 - 177GB SAS SSD modules and FC 205x RAID cards for them.
 - LTO-5 Tape
 - And other features
 - TR 3 adds Bridging and Etherchannel support.
 - Works on all servers that support IBM i 7.1
 - TR 4 brings support for a new Ethernet card for example.
 - Also lots of DB stuff, Live partition mobility
 - TR level 6 is now current
 - POWER7+
 - V3700 and V7000 Native IBM i attach



Related PTF Groups

| <u>Includes: Group</u> | HIPER | DB | JAVA | HTTP |
|----------------------------|----------|----------------|----------------|----------------|
| Cume | Included | Included | | |
| Security | *1 | | | |
| HTTP | | | Included | |
| x Integration | | | Included (6.1) | |
| WebQuery | | Included (6.1) | Included | Included (6.1) |
| WebSphere | | Included | Included | Included |

*1) Security Group is a Subset of the HIPER group

WRKPTFGRP

Note that F11 displays text describing the group
Option 9 displays related groups.

Group Number

```
PTF group . . . . . : SF99709
Level . . . . . : 78
Status . . . . . : Installed
Target release . . . . . : V7R1M0
Text . . . . . : GROUP HIPER
```

Group Level

Group Status

Work with PTF Groups System: V7R1PR0D

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

| Opt | PTF Group | Level | Status | Text |
|-----|-----------|-------|-----------|---|
| — | SF99710 | 13037 | Installed | CUMULATIVE PTF PACKAGE C3037710 |
| — | SF99709 | 78 | Installed | GROUP HIPER |
| — | SF99707 | 6 | Installed | TECHNOLOGY REFRESH |
| — | SF99706 | 3 | Installed | HIGH AVAILABILITY FOR IBM I |
| — | SF99705 | 4 | Installed | HARDWARE AND RELATED PTFs |
| — | SF99701 | 21 | Installed | DB2 FOR IBM I |
| — | SF99637 | 2 | Installed | DB2 WEB QUERY FOR IBM I V1.1.2 |
| — | SF99627 | 8 | Installed | 7.1 ELECTRONIC SERVICES GROUP PTF |
| — | SF99617 | 4 | Installed | DB2 WEB QUERY FOR IBM I V1.1.1 |
| — | SF99572 | 12 | Installed | JAVA |
| — | SF99369 | 13 | Installed | IBM I INTEGRATION WITH BLADECENTER AND SYSTEM |
| — | SF99368 | 17 | Installed | IBM HTTP SERVER FOR I |
| — | SF99367 | 7 | Installed | TCP/IP PTF |

From F11

Show latest group only with: WRKPTFGRP PTFGRPLVL(*LATEST)

Related PTF groups

Option 9 from WRKPTFGRP

```
Display Related PTF Groups

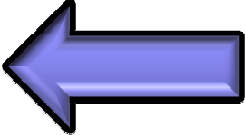
PTF group . . . . . : SF99368          System:  V7R1PR0D
Level . . . . . : 17
Text . . . . . : IBM HTTP SERVER FOR I
Status . . . . . : Installed

Type options, press Enter.
 5=Display  6=Print  9=Display related PTF groups

Opt  Related
    PTF Group      Level  Status
  █  SF99572        12    Installed
```

Here we see that the Java group is included in the HTTP.

Agenda

- What is a PTF?
- What to PTF
- PTF Stati and Life Cycle
- PTF Groups
- To PTF or not to PTF 
- Fix Central
- Load and Apply
- Customize Defaults and using Virtual Media



To PTF or not to PTF

- You need to have a strategy. Ones I've seen:
 - If it ain't broke, don't fix it.
 - Once a year is good enough.
 - Get the CUMe's but ditch the rest.
 - CUMe plus all the rest now and then.
 - Get 'em all constantly.
- Somewhere in the middle is a good place to be but there are specific PTFs to consider from time to time.



Why PTFs?

- PTF's have three major purposes
 - First is the obvious fix.
 - Second is new function or support for new devices.
 - Third are the odd PTF to change a default.
 - For example the behavior of WRKJOB option 14.
- Besides the major functions there may be PTFs issued to 'fix' a major application (i.e. BPCS or SAP) to work even though IBM's code isn't really 'broken' just behaving differently since a previous release.
- Can you understand why you don't want every PTF?
 - Fortunately there is no way to get them all!!
 - Getting none of them isn't a good option either!



Make a plan.

- Most important piece is your software.
 - Some packaged software has specific PTF requirements and these are priority #1
 - You must also consider what pieces you are currently utilizing for in house projects. If you're using RPG III (shame on you) the fixes will be few, if it's PHP and JAVA the fixes will be frequent and more urgent.
- Following that is your hardware.
 - Certain, especially newer features, require minimum PTF levels or potentially have true 'Fix PTFs' which you should have.
 - This is a good place to stay current on HIPER groups
- Next is the age of your OS Version.
 - Currently if you are on V5R3 PTF activity is done.
 - If you are on V5R4 PTFs are still flowing but have slowed significantly.
 - If you are on IBM i 7.1 or 6.1 HIPER groups are still bi-weekly!
 - Clearly this affects how often you need fixes on your system.

One way to research PTFs

■ IBM's Recommended Fixes page

- Select your release
 - Back to V5R4
- Select area of interest
 - 23-30 PTF Groupings
 - Depends on release
 - Click 'Go'
 - Most do not line up with a PTF group
- Sample Next page

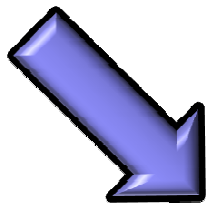
Recommended for specific products or functions

Consider the specific products and functions that are crucial for your system environment and applications. The Support Center provides additional information for a number of topics.

Select your release: 7.1 6.1 5.4

Then select a topic:

- High Availability: Cluster, IASP, and XSM
- AS/400 NetServer
- Database
- ECS
- Electronic Service Agent
- High Availability: Cluster, IASP, and XSM
- HMC Code Updates
- IBM Facsimile Support for iSeries
- IBM Tivoli Directory Server
- InfoPrint Server
- Management Central
- Operations Console
- PM iSeries
- Print
- Server Firmware and HMC Wizard
- Server Firmware: POWER Blade
- Server Firmware: POWER Blade
- Server Firmware: Update Policy Set to HMC
- Server Firmware: Update Policy Set to HMC
- Server Firmware: Update Policy Set to Operating System - POWER5™
- Server Firmware: Update Policy Set to Operating System - POWER6™



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

Sample: HA: Cluster, IASP, XSM

System i Recommended Fixes - High Availability: Cluster, IASP, and XSM

Document Information

Topic: High Availability: Cluster, IASP, and XSM

Recommendations

These recommendations are based upon your system already having installed the most current Cumulative PTF Package, HIPER Group PTF, and Database Group PTF. For further information or to order these PTFs, please follow this link:

<http://www.ibm.com/eserver/support/fixes/>

The Rochester Support Center recommends installing the group and individual fixes listed below for corrective service and preventative maintenance. If a problem persists after the recommended fixes have been installed, the Rochester Support Center can more efficiently diagnose the problem and additional fixes may be recommended.

Order the following recommended fixes:

The following table includes the fixes for Cluster, Switchable IASP, XSM Geographic Mirroring and Journaling that are related to High Availability and are not in the latest Cumulative PTF Package. It is advised that these PTFs be applied to all cluster nodes in the cluster. Review the cover letters for special instructions by clicking on the PTF number.

V7R1M0

| Date added | Fixes | Product | Description |
|------------|-------------------------|---------|---------------------------|
| 13-Aug-10 | MF50965 | 5770999 | SLIC (Storage Management) |
| 27-Jul-10 | SI40059 | 5770SS1 | XPF (Cluster) |
| 29-Jun-10 | SI38884 | 5770SS1 | Admin Domain |

NOTE!

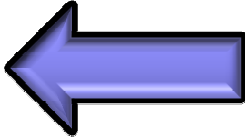


The Process

As alluded to some slides back a PTF goes through a series of stati on your system.

- Order – Methods
 - Fix Central (Preferred)
 - SNDPTFORD
 - 1-800-IBM-SERV
- Load
 - LODPTF
 - PTF menu Option 8 - Install program temporary fix package
- Apply
 - APYPTF
 - PTF menu Option 8 - Install program temporary fix package
- Active
 - Often true as soon as they are applied
 - Some require an IPL or other additional action.

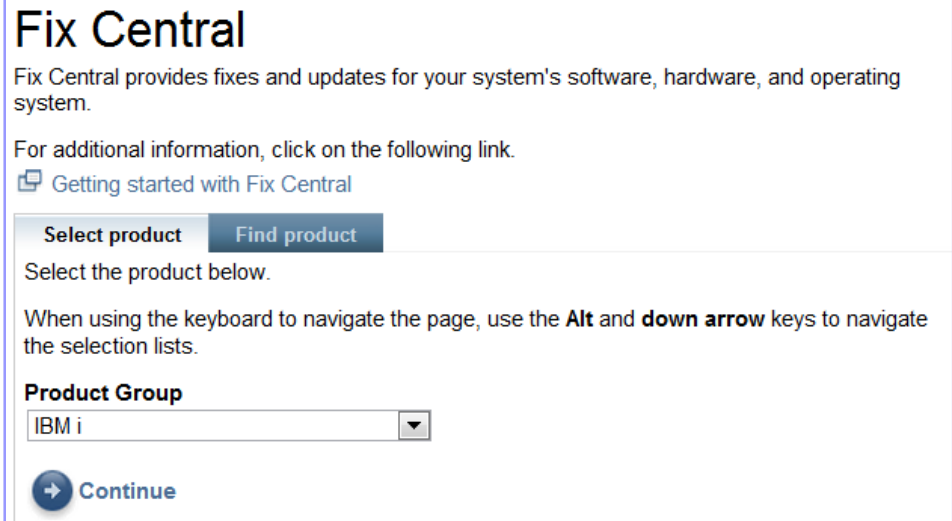
Agenda

- What is a PTF?
- What to PTF
- PTF Stati and Life Cycle
- PTF Groups
- To PTF or not to PTF
- Fix Central 
- Load and Apply
- Customize Defaults and using Virtual Media

Fix Central

- Ordering Options:
- For Firmware, HMC Select System i for POWER5 or older, POWER for POWER6 or 7
- For IBM i (i5/OS) Select “IBM I”
 - Can also simply use Quick Order →
- You need an IBM ID

www-912.ibm.com/eserver/support/fixes/fixcentral



Fix Central
Fix Central provides fixes and updates for your system's software, hardware, and operating system.

For additional information, click on the following link.
[Getting started with Fix Central](#)

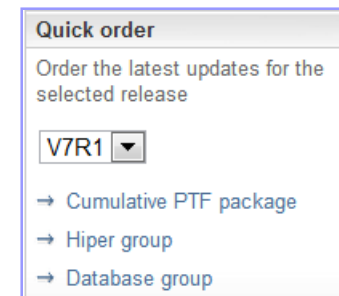
Select product Find product

Select the product below.

When using the keyboard to navigate the page, use the **Alt** and **down arrow** keys to navigate the selection lists.

Product Group
IBM i

Continue



Quick order
Order the latest updates for the selected release

V7R1

→ Cumulative PTF package
→ Hiper group
→ Database group

Select PTFs to get

- New starting point to select which way you're going to identify PTFs to download.

Select Version
for Groups

Enter specific
PTFs if known.

Search by Text

Continue

Identify fixes

Select the latest Cumulative PTF package, browse for group PTFs, or search for PTFs by ID or description.

| | |
|---|--|
| <input checked="" type="radio"/> Cumulative and group PTFs | Browse Cumulative and group PTFs for the selected IBM i release. |
| <input type="radio"/> Individual fix IDs | Search for PTFs by entering one or more PTF IDs each separated by a comma or whitespace. (e.g., SF99504, SI19202). PTFs can be from any release. |
| <input type="radio"/> Text | Search for PTFs by entering text from the PTF title or ID. PTFs from releases V5R3 and greater will be searched. |

Group PTFs to select

- Here are the groups. Add to the download list and continue.

Select fixes
IBM i, i5/OS, and OS/400

Select fixes

The following results match your request. Select the fixes you want to download.

· To try a different query, go to the [Identify fixes](#) page.

View results:
Default ▾

Continue Clear selections Show fix details | Hide fix details

1-10 of 20 results Next → Results per page: 10 | All

| | | |
|--------------------------|---|--------------|
| <input type="checkbox"/> | 1. Cumulative: SF99710 → Release: V7R1M0 Abstract: Cumulative PTF package C1270710 Level: 11270 Coverletter | Oct 13, 2011 |
| <input type="checkbox"/> | 2. Group: SF99709 → Release: V7R1M0 Abstract: Group Hiper Level: 00058 Coverletter | Apr 24, 2012 |
| <input type="checkbox"/> | 3. Group: SF99708 → Release: V7R1M0 Abstract: Group Security Level: 00016 Coverletter | Apr 24, 2012 |

Select

Continue

You can select more than one group saving download size

Continue Back

Connected ordering

- Connect to your system
- Can use name or IP address
- Verify shipping information

Order fixes

Fix Central Client

Sign on to your iSeries or AS/400 system that is the target system for the fixes.

iSeries name or TCP/IP address

User ID

Password

View or update your shipping information for this order

[← Back](#) [→ Continue](#) [× Cancel order](#) [→ Your pri](#)

What and how to get.

■ Connected

- Checks system for pre and co-reqs
- Orders only what you need
- Can select to order all
- Can order without Reqs

■ Disconnected

- Download with Director or FTP
- With FTP name the directory and file name on the FTP server (so you can identify them!)

Download options

IBM i, i5/OS, and OS/400

Select download options

Provide a name to identify this order for viewing at a later time
Order name

Select the options for receiving your fixes.

To customize your order, you can connect to the system for which you are ordering fixes and validate your download list against the inventory of the system. PTFs already installed on the system or for products not supported on the system will be removed from your order.

[Customize your order](#)

Download individual fixes directly to my system

Download virtual images using Download Director [What is this?](#)

Download virtual images using FTP

Email address

Directory name

Base file name

Order fixes on physical media (requires Software Maintenance Agreement)

i Requisites are always included when ordering cumulative or group PTFs.

Connected download options

- Immediate individually downloads PTFs to save files in QGPL
- Intermediate location is your PC during the download

Download fixes to my system
IBM i, i5/OS, and OS/400

Download fixes

Sign on to the target System i.

Sign on to the target System i.

System name or TCP/IP address

User ID

Password

[← Back](#) [→ Continue](#) [✕ Cancel order](#) [→ Your privacy](#) [→ Help](#)

Download fixes to my system
IBM i, i5/OS, and OS/400

Download fixes

Starting download

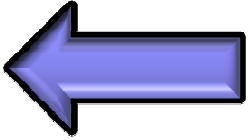
Downloading files

Elapsed time: 00:01:32

Estimated time remaining: 00:40:29

Completed 64 of 619

Agenda

- What is a PTF?
- What to PTF
- PTF Stati and Life Cycle
- PTF Groups
- To PTF or not to PTF
- Fix Central
- Load and Apply 
- Customize Defaults and using Virtual Media

LODPTF - Load PTF

Where the PTF is being loaded from:

- A Device, a Save File, *SERVICE
- *Service automatically finds the *SAVF

Product PTF Applies to

Which PTFs

```

Load Program Temporary Fix (LODPTF)

Type choices, press Enter.

Product . . . . . 5722999
Device . . . . . *service
PTF numbers to select . . . . . mf31234
    + for more values          mf34567
PTF numbers to omit . . . . .
    + for more values
Superseded PTFs . . . . . *apyperm
Release . . . . . *ONLY
    
```

F4 for list
Name, *SERVICE, *SAVF
Character value, *ALL
Character value
*APYPERM, *NOAPY
*ONLY, VxRyMz

What to do about PTFs that are superseded

APYPTF – Apply PTF

Product PTF Applies to.
•Can use *ALL here

Which PTFs to deal with

Apply Perm or Temp

```
Apply Program Temporary Fix (APYPTF)

Type choices, press Enter.

Product      . . . . . > 5722999
Release      . . . . . > *ONLY
PTF numbers to select . . . . . > MF31234
      + for more values > MF34567
PTF numbers to omit . . . . .
      + for more values
Extent of change . . . . . > *TEMP
Delayed PTFs . . . . . > *YES
IPL apply options:
  Apply at unattended IPL . . . . . > *YES
  Prerequisite lic int code . . . . . > *APYPERM
  Apply requisite PTFs . . . . . > *YES

F4 for list
*ONLY, VxRxMx
Character value, *ALL

Character value

*TEMP, *PERM
*NO, *YES, *IMMDLY

*NO, *YES
*APYPERM, *NOAPY
*NO, *YES
```

Apply now (*NO)
or at IPL (*YES)

Handle Pre and CoReqs

Handle Delayed PTFs



Getting time to apply

When PTFs are applied they can be applied either Immediately or Delayed.

■ Immediate Apply

- The changes or updates become active Immediately
- Not all PTFs can be applied Immediately
 - Some require a particular program be inactive
 - Some require an action be performed to be active
 - Some flat out require an IPL
- Some will happily apply immediately but then require an IPL to become active. (Booo!)



Getting time to apply

■ Delayed Apply

- Some PTFs have requirements that can only be met by doing the apply during an IPL.
 - Typically these are co-req and pre-req requirements.
 - Can also be code that is always in use so and IPL is the only time to replace it.
 - For example one MF (LIC) PTF may be replacing another. In order to do that the one being replaced may need to be permanently applied.
- The PTF is applied at the next IBM i IPL
 - All Pre and Co-req PTFs are also applied at this time.
 - Remember that some PTFs may get permanently applied even when you are doing a temp apply.
 - Remember the option on APYPTF that says don't apply if this is the case.



Bulk PTF apply

- Doing any quantity of PTFs typically involves install from CD.
- This is done from PTF menu option 8 – Install package
- PTFs can be loaded during normal operations and set for apply at next IPL.
 - LAND MINE! If an IPL occurs when you don't expect you will be doing PTFs when you may not want to.

PTF Menu option 8 (Install Package)

```

Install Options for Program Temporary Fixes
System: FIIIIV5R4
Type choices, press Enter.
Device . . . . . OPTVRT01      Name, *SERVICE, *NONE
Automatic IPL . . . . . Y      Y=Yes
                                N=No
Prompt for media . . . . . 1    1=Single PTF volume set
                                2=Multiple PTF volume sets
                                3=Multiple volume sets and *SERVICE
Restart type . . . . . *SYS    *SYS, *FULL
Other options . . . . . Y      Y=Yes
                                N=No
-----
Omit PTFs . . . . . N        Y=Yes, N=No
Apply type . . . . . 1        1=Set all PTFs delayed
                                2=Apply immediate, set delayed PTFs
                                3=Apply only immediate PTFs
PTF type . . . . . 1          1=All PTFs
                                2=HIPER PTFs and HIPER LIC fixes only
                                3=HIPER LIC fixes only
                                4=Refresh Licensed Internal Code
Copy PTFs . . . . . N        Y=Yes, N=No

```

Batch PTF Installs

- Sometimes you don't want to sit and watch
- Instead, use the INSPTF command in batch
- All the parms below line up with the option 8 fields


```
Install Program Temporary Fix (INSPTF)

Type choices, press Enter.

Product description:
  Product . . . . . > *ALL          F4 for list
  Release . . . . . > *ONLY        *ONLY, VxRyMz
                        + for more values
Device . . . . . > OPTVRT01      Name, *SERVICE, *NONE
PTF apply type . . . . . > *DLYALL  *SRVATT, *DLYIPL, *DLYALL..
PTF omit list:
  Product . . . . . > 5770SS1     F4 for list
  PTF identifier . . . . . > SI00666 Character value
  Release . . . . . > *ONLY        *ONLY, VxRyMz
                        + for more values
HIPER PTFs only . . . . . > *NO          *YES, *NO
End of media option . . . . . > *REWIND  *REWIND, *LEAVE, *UNLOAD
Prompt for media . . . . . > *SNGVOLSET *SNGVOLSET, *MLTVOLSET...
Copy PTFs . . . . . > *YES        *SRVATT, *YES, *NO
```



Agenda

- What is a PTF?
- What to PTF
- PTF Stati and Life Cycle
- PTF Groups
- To PTF or not to PTF
- Fix Central
- Load and Apply
- Customize Defaults and using Virtual Media 



Customizing PTF Defaults

- CHGSRVA allows customizing some aspects of PTF behavior
 - PTFINSTYP parm sets the default install type.
 - *DLYIPL: Set all PTFs for delayed IPL and automatically IPL
 - *DLYALL: Set all PTFs for delayed IPL but do NOT IPL
 - *IMMONLY: Only immediate PTFs are applied, delayed PTFs are omitted. No IPL is done.
 - NOT recommended for use with CUMEs
 - *IMMDLY: Immediate PTFs are applied, delayed PTFs are set for delayed apply but NO IPL is done.
 - NOT recommended for use with CUMEs
 - CPYPTF parm sets default for copying PTFs
 - *YES: PTFs and cover letters are copied to *SERVICE (SAVFs) when loaded from Optical or Tape
 - *NO: They ain't.



Virtual Media Advantages

- Never touch plastic.
- No need to actually be on site.
- Fantastically faster than any plastic disk.
 - Seriously you can't see the numbers go by on i5 systems!
- Virtual Drives never need cleaning!
- Un-scratchable Media!
- No I/O errors during the PTF load as these are detected at the time of load or VFYIMGCLG.
- Easy to copy the images to another system or partition.
(under 20 seconds per CD Image across GbE with FTP.)
- As of V6R1 THEY DO NOT NEED TO BE COPIED!!
 - See instructions in the extended portion of the Handout!



Summary

- Proper PTF management keeps your system running smoothly
- Know your system, where are you leading and where are you trailing as this helps you know where PTFs are required.
- Groups are a key tool for PTF management
- Image catalogs are THE way to manage PTFs

Managing IBM i PTFs



“What applications have you brought to IBM i today?”



Larry Bolhuis
Frankeni Technology Consulting, LLC.
lbolhuis@frankeni.com
www.frankeni.com



Appendices

- Using Virtual Media
- Getting PTF Save files recognized to the PTF process
- Fix Central PTF Download flow



Virtual Media Interface (VMI)

- VMI is the Rochester term for Virtual Optical and Virtual Tape.
- Essentially they have created a virtual bus and a virtual IOP to which virtual optical drives (CD and DVD) and virtual tape drives.
- WRKHDWRSC *STG and observe the FC #268C IOP and FC #6B02 storage controller.
 - Option 9 against the FC #6B02 will show each of the Virtual Optical and Virtual Tape drives on your system.
 - Virtual Optical FC #632B
 - Virtual Tape FC #63B0



Creating Virtual Devices

- Optical drive

```
CRTDEVOPT DEVD(OPTVRT01) RSRCTYPE(*VRT) TEXT('Virtual  
Optical drive # 01')
```

- Virtual Optical drives are DVD-RAM type.
- Support started in V5R2 and V5R3 allowed multiple drives.

- Tape drive

```
CRTDEVTAP DEVD(TAPVRT01) RSRCTYPE(*VRT) TEXT('Virtual  
Tape Drive #01')
```

- Sort of a cross between a tape drive and a tape library.
- Works like a tape drive, except if you specify a volume ID and that ID exists in the image catalog it will 'auto load' that volume.
- Support started in V5R4 and allows multiple drives.

- Don't forget to vary them on!



But what goes into a virtual drive?

- Virtual Media of course, hence the name!
 - For the purpose of PTFs the media are created by IBM.
 - Downloaded with methods already described.
 - For other uses the media can be created from physical media or created blank and written to.
- Virtual Media are stored in Image Catalogs
 - The Image catalog object lives in QUSRSYS library
 - It is just a list of the images and the directory in which they live.
 - The binary Images of the disks are stored in the IFS directory specified in the Catalog object.



How to build the catalog

```
CRTIMGCLG IMGCLG(V7R1PTF)  
  DIR('/i5os/v7r1/ptf') TYPE(*OPT) CRTDIR(*YES)  
  TEXT('V7R1 PTF Images')
```

- Creates the catalog object and the directory.
- Use whatever tools you want to get the images into the directory specified above: FTP and the Netserver are the most likely suspects.
- Normally you would create the catalog before loading any images however this is not required unless you will be copying from physical media.



Adding media to the catalog

- First method is to import the contents of a physical CD or DVD
 - `ADDIMGCLGE IMGCLG(V7R1PTF) FROMDEV(OPT01)`
 - Interestingly the CD/DVD drive will eject once the copy is complete.
 - Size of the IFS object corresponds to the amount of information on the disk.
 - Time required is also based on this amount.
 - DVD's take a LOT longer (DUH!)
- My favorite option is to FTP in the catalog images to the appropriate directory and then:
 - `ADDIMGCLGE IMGCLG(V7R1PTF) FROMFILE('hiper02_1.bin') TOFILE(*fromfile)`
 - This requires the file 'hiper02_1.bin' is in the directory and takes about 1 second because it is only adding the catalog entry.



Adding media - Continued

- Another option if you have a QFileSvr.400, NFS mount, or QNTC share that contains the image files:
 - `ADDIMGCLGE IMGCLG(V7R1PTF)`
`FROMFILE('/some/nfs/mounted/dir/hiper02_1.bin')`
`TOFILE(*fromfile)`
 - This will copy the file from the remote file system and add it to the catalog.
 - Time depends on speed of connection and size of file.
- Additional options:
 - You may replace existing images with `REPLACE(*YES)` parm
 - You may specify the sequence number in the catalog with the `IMGCLGIDX(nn)` parm
 - You may add text as: `TEXT('This is HIPER group 02 disk 1')`



Sharing Virtual Media

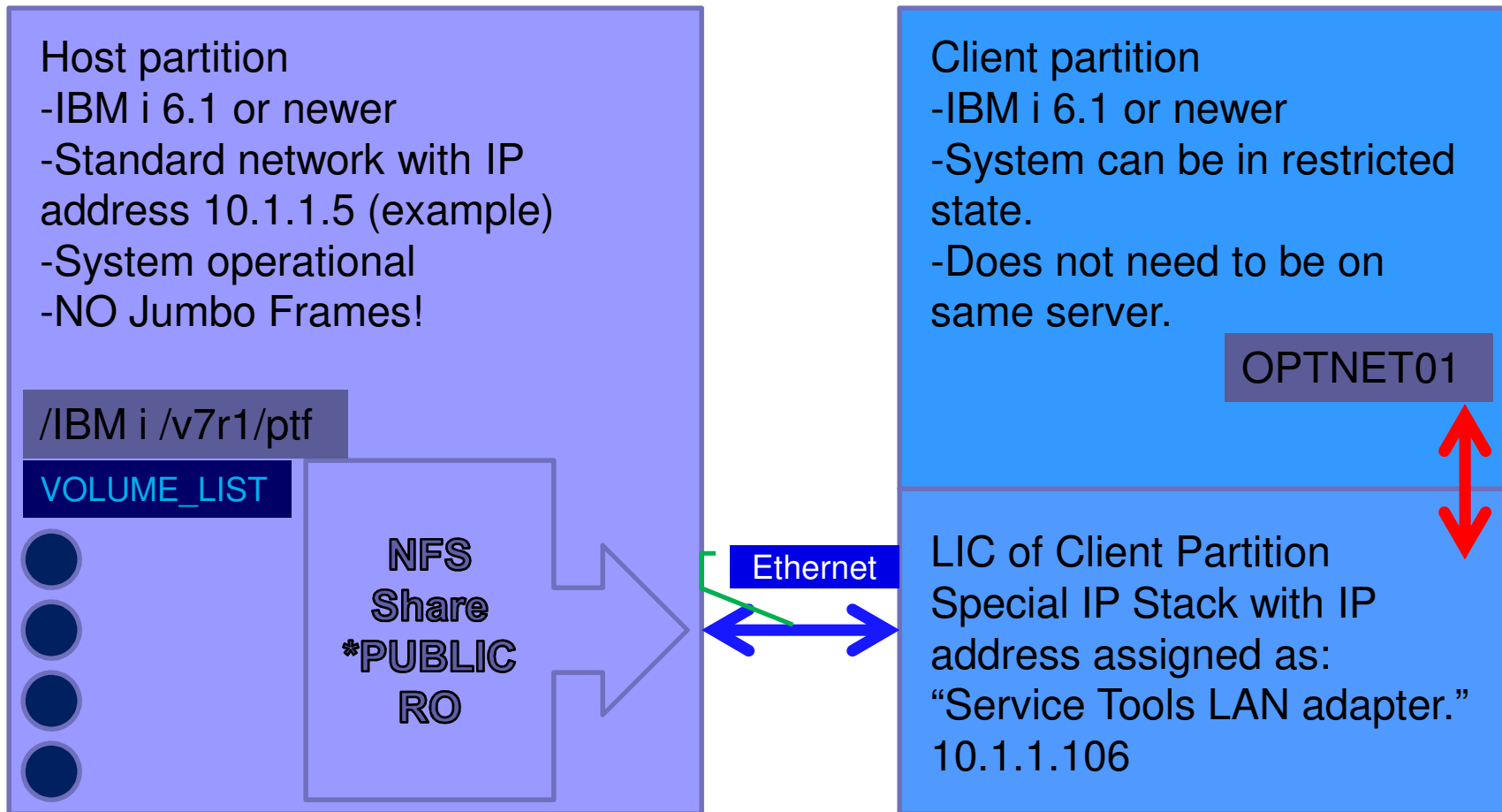
- Starting with POWER6 links VSCSI connections can be created between IBM i partitions.
 - In i 6.1 this connection passes along any optical devices
 - This includes virtual optical.
 - In i 7.1 IOPLess tape devices are also passed along.
 - This includes virtual tape.
- In WRKHDWRSC *STG these appear as FC #290A Storage Controller.
 - Option 9 against the FC #290A will show each of the Virtual Optical and Virtual Tape drives on your system.
 - Virtual Optical FC #632C
 - Virtual Tape FC #63B0
- In i 6.1 the optical 'disks' much be manually changed on the host partition
 - With i 7.1 they auto-load just as they do on the local partition.



Newest (and coolest!) Sharing.

- In i 6.1 IBM introduced network based virtual optical drives.
- NFS is used on a 'host' partition to hold all the image catalog objects.
 - A VOLUME_LIST file must exist in the directory with the images and contain the names of the images.
 - This is a simple text file (EDTF)
 - The Image Catalog isn't actually used on the host and the images need not be mounted in an optical drive on the host.
- A service tools (AKA 'LAN Console') interface is used on client partitions to reach across to and load the images.
 - An active Ethernet connection outside of Service Tools is not required while using network based virtual optical.
- A virtual optical drive is created on 'client' partitions that utilizes the service tools interface.
- This means no more copying images from partition to partition!!!
- To utilize these for UPGRADES a POWER6 or newer CPU is required.
- Host and Client do NOT need to be on the same machine or the same release.

Logical diagram of Network Optical



Service Tools LAN Configuration

Display LAN Adapter Configure On Dasd

System: V7R1DEV

```
Adapter type . . . . . : 268C ← In this case a Virtual Ethernet
Adapter serial number . . . : 00-00000

Internet address . . . . . : 10.1.1.106 ← Unique and in Same subnet
                                   as host partition

Gateway router address . . : 10.1.1.5 ← Optional if Same subnet
Subnet mask . . . . . : 255.255.255.0
Host name for service tools : V71DEVLANCON
Node . . . . . : 000000000000 ←----- Leave 0s to use adapter MAC
Duplex . . . . . : AUTO
Network speed . . . . . : AUTO

Ethernet standard . . . . . : ETHV2
```

- Needed only on Client Partition or system.
- Host partition only needs standard IBM i IP address to host NFS.



Host side setup

Once the images are in the IFS on the host, share them with these steps:

- Create VOLUME_LIST file:
 - VFYIMGCLG V7R1PTF TYPE(*PTF) SORT(*YES) NFSSHR(*YES)
 - Or EDTF '/ibmi/v7r1/ptf/VOLUME_LIST' and populate list of files.
- Set proper permissions:
 - CHGAUT OBJ('/ibmi/v7r1/ptf') USER(*PUBLIC) DTAAUT(*RX)
SUBTREE(*ALL)
- Start NFS
 - STRNFSSVR *ALL
- Share with NFS:
 - CHGNFSEXP OPTIONS('-i -o ro') DIR('/ibmi/v7r1/ptf')

Network based Optical Device

Crete Device Desc (Optical) (CRTDEVOPT)

Type choices, press Enter.

```
Device description . . . . . > OPTNET01      Name
Resource name . . . . . *VRT                Name, *SAME, *NONE...
Device type . . . . . *RSRCNAME             *RSRCNAME, 632A, 632B..
Local internet address . . . . . *SRVLAN    *SAME, *NONE, *SRVLAN
Remote internet address . . . . . '10.1.1.5' ← IP of Host system
Network image directory . . . . . '/ibmi/v7r1/ptf' ← Exact match to NFS Share
User ID number . . . . . 0                  0-4294967295, *SAME
Group ID number . . . . . 0                  0-4294967295, *SAME
Online at IPL . . . . . *NO                 *SAME, *YES, *NO
Message queue . . . . . QSYSOPR             Name
  Library . . . . . QSYS                    Name, *LIBL, *CURLIB
Text 'description' . . . . . 'Virtual Drive for PTFs'
```

- Now vary it on.
- Note: 1Gb Adapters are faster 😊



Using the virtual media

- Load the catalog into the virtual drive.
 - `LODIMGCLG IMGCLG(V7R1PTF) DEV(OPTVRT01)`
`OPTION(*LOAD) WRTPTC(*DFT)`
 - Write protect is always *YES for IBM i and PTF media.
 - The first entry in the catalog will be available and can be seen with `WRKOPTVOL` or `WRKLNK '/QOPT/*'`

- Verify and Sort the catalog

```
VFYIMGCLG IMGCLG(V7R1PTF) TYPE(*PTF)
SORT(*YES)
```

- Basically makes sure the images are 'readable' and groups with multiple disks are in ascending sequence.
- Finally use the OPTVRT01 drive in PTF menu option 8.



PTFs in Save Files?

- Why would you want them to hang around?
 - 1) I sell disk.
 - 2) If you want to distribute with Management Central you must have them on the source system.
 - 3) If you want to use the new with V5R4 command SAVSYSINF you need the PTF Save files on your system that have been applied since your last SAVSYS.
 - SAVSYSINF does not require a dedicated system.



PTFs in Save Files, but...

- Using WRKOBJ you can find all the save files in QGPL
 - such as QSI12345
- Using DSPPTF option 1 shows Save File *NO
- This means that from an object standpoint the files are there however PTF management doesn't have the data recorded.
- To correct this condition run the UPDPTFINF command (no parameters)



Fix Central PTF Downloads

- FTP method
- Immediate Method

FTP Order Summary

- All PTFs that got ordered are listed
- Size is not available
- Two emails follow
 - Notification of receipt
 - Instructions for downloading and placing the images on your system

Summary

Your order will be sent to the FTP server

The Fix Central function has been completed.

Your order has been sent to the FTP server for processing. You will receive an email when the processing system receives the order. When the order is ready you will receive another email with instructions for downloading the fixes.

The following information is a summary of the processed order.

[← Return to Fix Central](#)

System information

System name: **FrankieIII**
Total size: **Not available**
Elapsed Time: **Not available**

Requested PTFs

| PTF | Status | Product description |
|---------|------------|---------------------|
| SF99504 | ftp server | |

Additional PTFs

| PTF | Status | Product description |
|---------|---------|---------------------|
| SI28176 | ordered | 57228S1 |
| SI27976 | ordered | 57228S1 |

FTP PTF email number 2

- This comes from CCSSBLDR@bldisdmc.vnet.ibm.com
- Note the “Directory on Server” contains the FTP directory entered when ordered.
- Note the name of the “Files to get” is based on the name entered.
- Also included are a list of ALL ptf's delivered
- They give you a password but anything will work! (I use my email addr)
- I use a fixed script on Frankie and replace only the directory name
 - Then use BIN, MGET *.bin followed by ASCII, MGET *.txt as only my files will be in this directory.
 - See next slide for example.

INFORMATION YOU WILL NEED TO RETRIEVE YOUR ORDER

```
Your userid          --> anonymous
Your password        --> e5m00hzq
FTP server           --> delivery01-bld.dhe.ibm.com
Transfer type        --> ascii/binary
Directory on server  --> /ccss/lv1/94779/v7r1/c
Files to get         --> ftpdb1.txt
                    --> ilstdb1.txt
                    --> db1_1.bin
```

PTF Script for IBM i

- This is the CL Program, I submit it to batch!
 - Uses QGPL/FTPCMD for FTP cmds, QGPL/FTPLOG for logs.
 - Both are source files.

```
PGM          PARM(&IPTF)

DCL          VAR(&IPTF) TYPE(*CHAR) LEN(10)

OVRDBF      FILE(INPUT) TOFILE(QGPL/FTPCMD) MBR(&IPTF)
CLRPFM      FILE(QGPL/FTPLOG) MBR(&IPTF)
MONMSG      MSGID(CPF0000)
OVRDBF      FILE(OUTPUT) TOFILE(QGPL/FTPLOG) MBR(&IPTF)

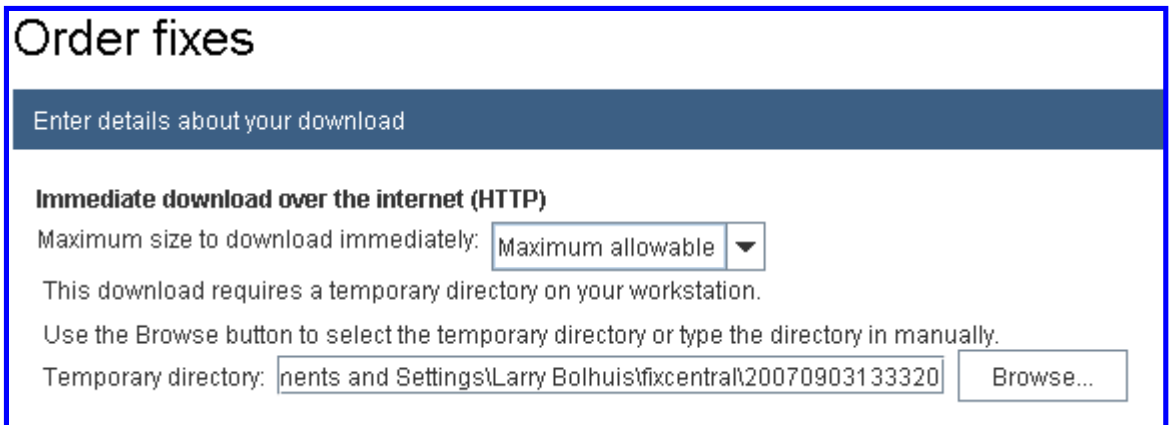
FTP          RMTSYS(PTF.Boulder.IBM.COM)
```

- This is the FTP Cmd string
 - Line 3 is where images go on Frankie. Adjust to taste.
 - Line 5 is what changes from the email on last slide.

```
1  anonymous    drfranken@frankeni.com
2  namefmt 1
3  lcd /imagepool/images/os400/v7r1/PTF/hiper
4  ascii
5  cd /ccss/lv1/97711/v7r1/c
6  mget *.txt
7  binary
8  mget *.bin
9  quit
```

Immediate Download

- Indicate the maximum size you'll accept.
- You name the temporary location on your PC



The screenshot shows a window titled "Order fixes" with a subtitle "Enter details about your download". It features a section for "Immediate download over the internet (HTTP)". Under this section, there is a label "Maximum size to download immediately:" followed by a dropdown menu currently set to "Maximum allowable". Below this, a note states: "This download requires a temporary directory on your workstation. Use the Browse button to select the temporary directory or type the directory in manually." At the bottom, there is a label "Temporary directory:" followed by a text input field containing the path "nents and Settings\Larry Bolhuis\fixcentral\20070903133320" and a "Browse..." button.

- Note that PTFs can get large so two things are true:
 - 1) Have enough space on the PC!
 - 2) Have a FAST connection to your *i*!

Immediate download Monitor

- Note that the PTFs are temporarily stored on your PC
- You must stay Connected to your *i* during the entire download

The screenshot shows a window titled "Order fixes" with a dark blue header bar containing the text "Downloader started successfully...". Below the header, it displays "Elapsed time: 00:01:23 seconds". A section titled "Download status" contains the following information: "Downloaded size: 902,012 of 48,205,538 by...", "PTFs downloaded: 1 out of 75", "Elapsed time: 00:00:17 seconds", and "Estimated time remaining: 00:13:58 seconds". A progress bar below this section shows 2% completion. At the bottom, a list titled "PTFs currently being downloaded" includes four entries: MF41413 (29,872 Bytes of 29,872 Bytes), MF41550 (4,000 Bytes of 286,784 Bytes), MF41604 (3,520 Bytes of 37,136 Bytes), and MF41649 (850,900 Bytes of 2,796,704 Bytes). The list has a scrollbar on the right side.

Immediate Order Summary

- All PTFs that were Downloaded are listed
- Total Size and time are shown.
- As with ALL Fix Central PTFs you must apply them yourself
- The PTFs here are in *SAVFs in QGPL while FTP method gets you images

Summary

Download successful

The Fix Central function has been completed.

The fixes you ordered have been downloaded to your system. For information on how to apply the fixes see the "Load and apply information" section below.

The following information is a summary of the processed order.

[← Return to Fix Central](#)

System information

| | |
|---------------|-------------------|
| System name: | frankieiii |
| Total size: | 3.14 MB |
| Elapsed Time: | 42 Seconds |

Requested PTFs

| PTF | Status | Product description |
|---------|------------|---------------------|
| SI25429 | downloaded | 5722881 |
| MF40285 | downloaded | 5722999 |

Additional PTFs

| PTF | Status | Product description |
|---------|------------|---------------------|
| SI25246 | downloaded | 5722881 |
| SI25233 | downloaded | 5722881 |
| MF40279 | downloaded | 5722999 |