



IBM Systems - iSeries

i5/OS and related software

Maintain and manage i5/OS and related software

*Version 5 Release 4*







IBM Systems - iSeries

i5/OS and related software

Maintain and manage i5/OS and related software

*Version 5 Release 4*

**Note**

Before using this information and the product it supports, be sure to read the information in "Notices," on page 71.

**Fourth Edition (February 2006)**

This edition applies to version 5, release 4, modification 0 of IBM i5/OS (product number 5722-SS1) and to all subsequent releases and modifications until otherwise indicated in new editions. This version does not run on all reduced instruction set computer (RISC) models nor does it run on CISC models.

© Copyright International Business Machines Corporation 1998 2006. All rights reserved.

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

# Contents

## Maintain and manage i5/OS and related software . . . . . 1

What's new for V5R4 . . . . .	1
Printable PDF . . . . .	2
Use software fixes . . . . .	3
Fixes concepts and terms . . . . .	4
Types of fixes . . . . .	5
Single fixes . . . . .	5
Cumulative PTF packages . . . . .	6
Fix groups . . . . .	6
Service packs . . . . .	7
Fix cover letters . . . . .	8
Sample fix cover letter and description of fields . . . . .	8
Fix save files . . . . .	10
Fix status information . . . . .	11
Fix status descriptions using iSeries Navigator . . . . .	11
Fix status descriptions using the command interface . . . . .	14
Fix order status . . . . .	16
Where to find information about fixes . . . . .	16
Fix summary lists . . . . .	16
Fix cross-reference summary lists . . . . .	17
Preventive service planning information . . . . .	17
Authorized program analysis reports . . . . .	19
Plan your fix management strategy . . . . .	20
Determine which interface to use . . . . .	21
Order fixes . . . . .	23
Order fixes using the Internet . . . . .	23
Order fixes using the Send PTF Order command . . . . .	24
Fixes and information you can order with the SNDPTFORD command . . . . .	24
Using the Send PTF Order command . . . . .	25
Specifying media for shipping a fix . . . . .	26
Additional considerations . . . . .	26
Install fixes . . . . .	27
Step 1: Review fix cover letters prior to fix installation . . . . .	27
Step 2: Prepare your server to install fixes . . . . .	27
Determine storage area before installing fixes . . . . .	27
Step 3: Choose your fix installation scenario . . . . .	28
Install cumulative PTF packages . . . . .	29
Install fixes received as save files . . . . .	30
Install fixes from media . . . . .	32
Distribute fixes to multiple servers with iSeries Navigator . . . . .	33
Install fixes on systems with logical partitions . . . . .	37
Install fixes on systems managed by Hardware Management Console . . . . .	38
Install fixes from an image catalog . . . . .	38
Step 4: Verify fix installation . . . . .	40

Advanced procedures for fix installation. . . . .	41
Advanced fix installation: Build a custom fix package . . . . .	41
Advanced fix installation: Build virtual image fix packages . . . . .	44
Advanced fix installation: Load fixes . . . . .	45
Advanced fix installation: Apply fixes . . . . .	46
Display fixes information on your server . . . . .	51
Display fix status with iSeries Navigator . . . . .	51
Display PTF information with the character-based interface . . . . .	51
Displaying PTF status information. . . . .	51
Displaying PTF details. . . . .	51
Display properties of a fix or fix group . . . . .	53
Display properties of a fix . . . . .	53
Display properties of a fix group . . . . .	53
Display an inventory of fixes on your server with Management Central . . . . .	53
Display level of fixes . . . . .	54
Display the cumulative PTF package level . . . . .	54
Determine your current cumulative PTF package level. . . . .	54
Print or display the summary of fixes in a cumulative PTF package on CD-ROM . . . . .	55
Work with fix cover letters . . . . .	56
Order fix cover letters . . . . .	56
Copy fix cover letters from media . . . . .	56
Display and print fix cover letters . . . . .	57
Displaying cover letters from iSeries Navigator . . . . .	57
Displaying and printing cover letters from the character-based interface. . . . .	57
Clean up fixes . . . . .	58
Delete save files with iSeries Navigator . . . . .	58
Delete save files with the DLPTPF command . . . . .	58
Clean up PTF groups . . . . .	58
Remove software fixes. . . . .	59
Remove licensed program fixes. . . . .	59
Remove IBM i5/OS fixes . . . . .	59
Remove Licensed Internal Code fixes. . . . .	60
Work with software agreements and licenses . . . . .	61
Software agreements and licensing concepts . . . . .	61
Software agreements . . . . .	61
Software license keys . . . . .	62
Plan for software licensing . . . . .	62
Determine the usage limit for products not in the keyed set . . . . .	63
Determine the usage limit for products priced by processor . . . . .	63
Manage software agreements and license keys. . . . .	63
Accept software agreements . . . . .	63
Display or print your software agreements . . . . .	64
Prepare software agreements for transfer of ownership. . . . .	64
Display and change software license information . . . . .	64

Add license key information. . . . .	64
Set the usage limit . . . . .	65
Distribute software license keys . . . . .	65
Manage software inventory . . . . .	66
Build and manage your own software products . . . . .	67
Package and send your own software products	67
Generate fixes for installed products using	
Management Central . . . . .	67
Generate software agreements for your own	
products . . . . .	68

Generate license keys for your own products . . . . .	69
Related information for Maintain and manage i5/OS	
and related software . . . . .	69

<b>Appendix. Notices . . . . .</b>	<b>71</b>
Programming Interface Information . . . . .	73
Trademarks . . . . .	73
Terms and conditions . . . . .	73

---

## Maintain and manage i5/OS and related software

This topic indicates how you can manage and maintain licensed programs and fixes in your network.

If you are looking for information about software installation, go to the Install, upgrade, or delete i5/OS™ and related software in the information center. Managing these areas is so important for several key reasons:

### The time it takes to operate a system

Regardless of how big or small a computer system or network is, it can take a significant amount of time to perform the daily operations, such as upgrading software, managing fixes, and resolving system problems. Time spent fixing a problem with a resource is a direct expense. Time spent operating without that resource contributes to lost revenue or increased overhead expense. Time spent upgrading software around the network is time that could have been better spent.

### The costs associated with managing a system

Money spent managing the system is money that does not produce revenue. It has been estimated that the cost of implementing a distributed computing environment is far less than the cost for the management and support of that environment. Companies who find ways to reduce or eliminate these expenses are the companies who have a better chance of surviving in today's business environment.

### The distribution of data

In the past, if you had a question about your company's operation, you walked down the hall and talked to the person who had the answer. However, with the globalization of industry and the proliferation of computers, information is no longer centralized but is distributed in nature, making it more difficult to obtain and requiring more people to control and manage it.

To help you manage these areas, iSeries™ Navigator provides a function called Management Central. Management Central provides many tools to manage IBM and non-IBM installed software products, to manage your fixes and software inventory, and to generate online software agreements and license keys.

In addition to using these tools, you can develop an effective strategy for managing and maintaining software.

---

## What's new for V5R4

- | This topic highlights the changes for maintaining and managing i5/OS and related software.
- | The Send PTF Order (SNDPTFORD) command now provides the ability to specify a special value for each of a predefined list of PTF groups and for the cumulative PTF package.

| *Table 1. New special values for the SNDPTFORD command*

Special value	Description
*CUMPKG	Cumulative PTF packages
*HIPERGRP	HIPER PTF groups
*DB2GRP	DB2® UDB for iSeries PTF group
*BRSGRP	Backup Recovery Solutions PTF group
*HTTPGRP	IBM® HTTP Server PTF group
*JVAGRP	Java™ PTF group
*PFRGRP	Performance Tools PTF group

| When you specify one of these new special values, the latest level of the PTF group or cumulative PTF package for the release of the operating system that is installed on the system is ordered.

| A new parameter of the SNDPTFORD command (Delivery format), allows you to select the format of the delivered PTFs. When the delivery format is \*IMAGE, the directory where the optical image files are stored and the prefix of the image file can be specified by using the Image directory (IMGDIR) and Image prefix (IMGPFX) parameters. A delivery format of \*IMAGE is supported only when your system is configured to use a Universal Connection.

*Table 2. New parameters for the SNDPTFORD command*

Parameter	Description
DLVRYFMT	Delivery format
IMGDIR	Image directory
IMGPFX	Image prefix

| If you are using Universal Connection, the default download limits have been increased. They can be lowered, however, only to a predefined minimum limit.



| For more information on the SNDPTFORD command, see “Order fixes using the Send PTF Order command” on page 24.

| A new Copy PTFs service attribute is available through the Display Service Attributes (DSPSRVA) command and the Change Service Attributes (CHGSRVA) command. You can use this new attribute to copy PTF save files and cover letters into \*SERVICE when PTFs are loaded from a tape or optical device. PTF save files must be in \*SERVICE when you distribute PTFs to other systems or when you use the Save System Information (SAVSYSINF) command. For further information on using the Copy PTFs service attribute, see “Fix save files” on page 10.

| The Delete Program Temporary Fix (DLTPTF) command has been enhanced to allow you to delete all PTFs for all products on your system. Previously only PTFs for a specific product could be deleted.

## How to see what's new or changed

To help you see where technical changes have been made, this information uses:

- The  image to mark where new or changed information begins.
- The  image to mark where new or changed information ends.

| To find other information about what's new or changed this release, see the Memo to Users.

---

## Printable PDF

Use this to view and print a PDF of this information.

To view or download the PDF version of this document, select Maintain and manage i5/OS and related software (about 224 KB).

You can view or download these related topics:

- Basic system operations (about 313 KB)

This topic introduces some of the key concepts and tasks required for iSeries basic operations.

- Logical partitions (about 273 KB)

The iSeries server offers you the ability to partition one system into several independent systems. If you want to use logical partitions, it is essential that you understand the concepts behind this type of system configuration.



- Management Central (about 250 KB)

Management Central is a suite of easy-to-use systems management functions that come to you as part of your base operating system. You can use Management Central to manage one or more systems through a single central system. Many of the software management tasks can be performed with the Management Central function that is part of iSeries Navigator.

- Install, upgrade, or delete i5/OS and related software (about 2438 KB)

Use the information in this topic to successfully plan for and complete an installation or upgrade of the i5/OS release on your server or logical partition. This topic also contains information to help you install software other than the i5/OS release and to delete licensed programs that you no longer need.

- Distribute software (about 267 KB)


You might want to duplicate some or all of a system's programs, including the operating system, to another system. You can also duplicate some or all of a logical partition's programs to another logical partition.

## Saving PDF files

To save a PDF on your workstation for viewing or printing:

1. Right-click the PDF in your browser (right-click the link above).
2. Click the option that saves the PDF locally.
3. Navigate to the directory in which you want to save the PDF.
4. Click **Save**.

## Downloading Adobe Reader

You need Adobe Reader installed on your system to view or print these PDFs. You can download a free copy from the Adobe Web site ([www.adobe.com/products/acrobat/readstep.html](http://www.adobe.com/products/acrobat/readstep.html)) .

### Related reference

“Related information for Maintain and manage i5/OS and related software” on page 69

Many resources exist to help you manage your fixes and software inventory. This topic will take you to the Web sites for the Software Inventory Utility and the IBM eServer™ iSeries Support, which includes information about downloading fixes, PSP information, and much more!

---

## Use software fixes

Keep your operating system and other software current with fixes (or program temporary fixes, PTFs). Fixes play an important part in your system's maintenance strategy. Your maintenance strategy can reduce system downtime, add functionality, and provide optimal availability.

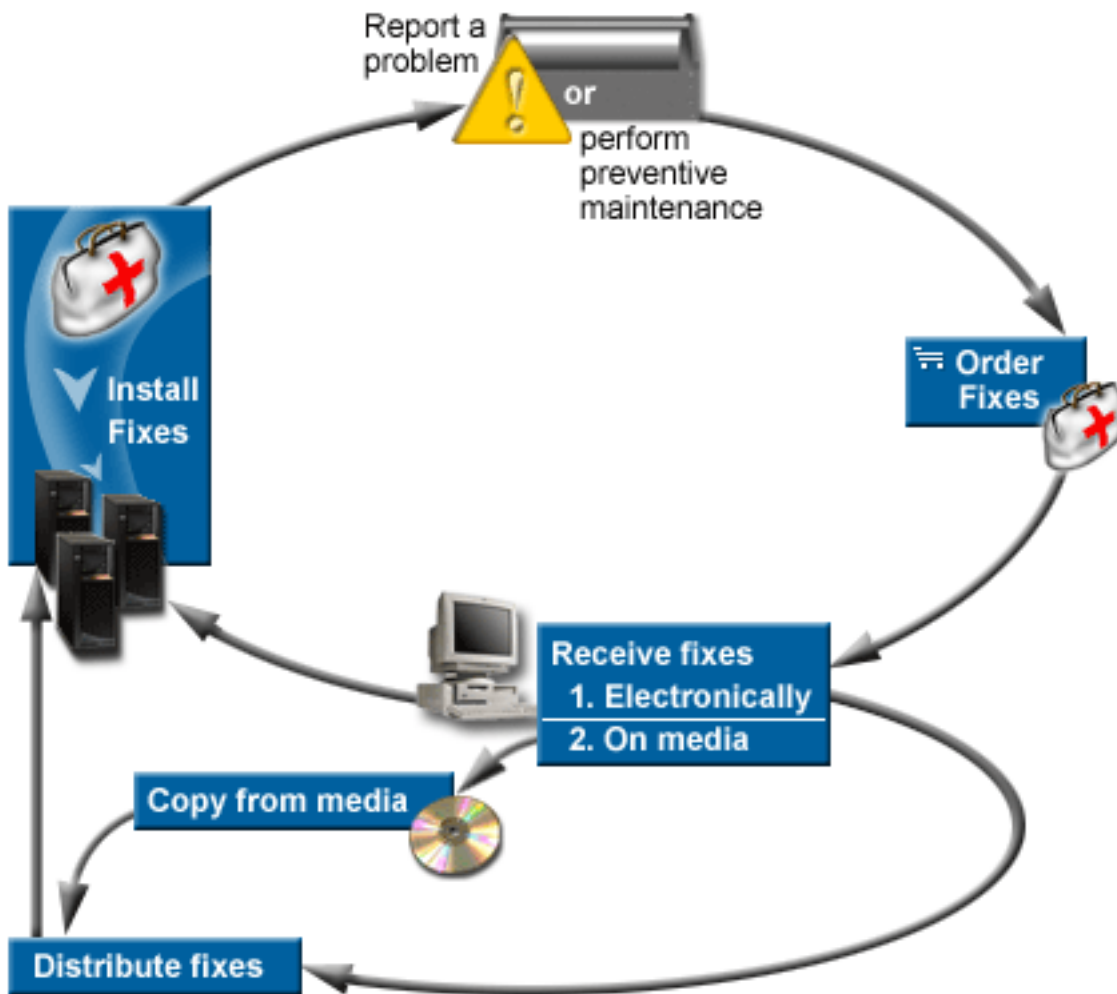
Periodically, problems are discovered in iSeries programs. IBM issues a fix (also known as a PTF, or program temporary fix) to correct the problem. Multiple fixes are bundled together to form a cumulative PTF package, which contains certain recommended fixes. Cumulative PTF packages should be installed quarterly in dynamic environments, and less frequently in stable ones. Cumulative PTF packages should also be considered when you make major hardware or software changes to your environment.

Fixes, fix groups, cumulative packages, and high-impact pervasive (HIPER) fixes play an important part in your system's maintenance strategy. Your maintenance strategy can reduce system downtime, add functionality, or provide optimal availability.

iSeries Navigator includes Management Central, a technology for doing system management tasks across one or more servers at the same time. Management Central provides wizards that simplify fix management. The wizards allow you to easily send, install, and uninstall fixes on multiple systems. You can also use the compare and update wizard to compare a model system to multiple target systems to find missing or extra fixes.

The following figure shows the life cycle of a fix and includes the following tasks:

1. **Report a problem or perform maintenance.** You may have occasion to report a hardware or software problem, which can result in a PTF being created to fix your problem. Typically, as part of your preventive maintenance strategy, you will identify fixes that are needed to keep your business running smoothly.
2. **Order.** As part of your normal fix strategy, you will order fixes to keep your software current. Once you have identified which fixes you need, the next task is to order them.
3. **Receive fixes.** After you order them, you receive the fixes either electronically or on media.
4. **Install.** When you receive the fixes, you can install them.
5. **Redistribute (optional).** If you received them on media and you want to distribute the fixes, you need to copy your save files from media before you can send and install the fixes to target systems.



#### Related tasks

Analyze and report system problems

## Fixes concepts and terms

Use this information to learn more about iSeries software fixes including the fixes available to you, how to find out about current fixes, what a fix status means, and more.

Many concepts and terms are associated with program temporary fixes (PTFs) or fixes. In fact, throughout these topics you will see the terms program temporary fix (PTF) and fix used interchangeably.

The PTF terminology existed long before the iSeries server, and today is associated mainly with the character-based interface ("green screen interface"). Its presence is seen in CL commands such as these: Display PTF (DSPPTF), Send PTF Order (SNDPTFORD), and Display PTF Cover Letter (DSPPTFCVR). The fix terminology was introduced with the graphical user interface of iSeries Navigator. Both terms mean the same thing.

## Types of fixes

- | IBM provides you with a variety of fixes: cumulative program temporary fix (PTF) packages, fix groups, High Impact PERvasive (HIPER) fixes, and others.
- | Each fix has its own purpose. This topic introduces you to the different kinds of fixes and discusses when each type is available.

### Single fixes:


- | Single PTFs (fixes) are applied to correct specific reported problems.
- | A single fix is tested by IBM and is made available to all IBM customers. Single fixes are capable of being downloaded with electronic customer support or from the Internet and might also be available on media.
- | Single fixes can identify other single fixes as prerequisite, corequisite, or distribution requisite fixes.

### HIPER PTFs

- | A *HIPER (High Impact PERvasive) PTF* resolves a problem that might have a high impact on IBM i5/OS operations or a pervasive problem that affects most iSeries servers.

HIPER PTFs correct severe problems that occur on your system. HIPER PTFs represent two types of problems: *high impact or pervasive* and *high impact and pervasive*. Examples of these situations include the following:

- Your system might crash or hang and require a restart or IPL (initial program load) to recover.
- Your system might be stuck in a looping condition.
- Your system's data integrity might be threatened.
- Your system may experience a severe performance degradation, or the problem involves usability of a product's major function.

- | If any of the fixes are needed to address these situations for your system, order and install the HIPER fixes. To help you manage HIPER fixes, IBM maintains a HIPER PTF group that contains a list of all current HIPER fixes for each supported i5/OS release. For a complete listing of HIPER fixes, see the preventive service planning information at the IBM eServer iSeries Support  Web site.

### Prerequisite fix

A *prerequisite fix* is a fix that must be installed on your server before or at the same time as the fix that you want to install.

The system will prevent you from installing your fixes if you do not have the prerequisite fixes. Your fix cover letter or PSP information can identify other fixes that must be installed before or at the same time as the fix that you want to install.

### Corequisite fix

A *corequisite fix* must be installed at the same time as the fix that you are requesting to install.

Your fix cover letter or PSP information can identify other fixes that must be installed before or at the same time as the fix that you want to install. In addition, system error messages can notify you that the fix that you are attempting to install has requisite fixes. The system checks that the corequisite fixes are installed at the same time. In this case, you need to verify that your fixes installed successfully.

## Distribution requisite fix

A *distribution requisite fix* is required only for distribution purposes. The system does not require you to apply distribution requisite fixes, but it is recommended that they be applied with the dependent PTF. If you are sending a fix using Management Central, distribution requisite fixes are not sent.

## Delayed and immediate fixes

Some PTFs (fixes) can be applied without requiring an IPL and other fixes can be applied only during an IPL. The cover letter tells you if the PTF is immediate or delayed.

### Delayed fixes

Delayed fixes can be applied only during an IPL. Delayed fixes that affect the Licensed Internal Code can be applied immediately when the server is running on the A storage area.

### Immediate fixes

Immediate fixes can be applied without requiring an IPL if the objects that they affect are not in use. Immediate fixes can also be applied when you do the next IPL.

### Related tasks

“Step 4: Verify fix installation” on page 40

After you have installed your fixes, you should verify that the install was successful.

## Cumulative PTF packages:

Cumulative program temporary fix (PTF) packages contain fixes for a given release of the i5/OS operating system. The fixes contained in a cumulative PTF package are for the Licensed Internal Code and most licensed programs that can be installed on that operating system release.

As the name implies, each package is cumulative; that is, it contains all of the fixes from the previous package plus additional fixes released since the previous package. Many, but not all, new fixes are included in cumulative packages. The fixes that are not included are typically applicable only to a specific user's situation or application. These fixes are not included for general availability to avoid introducing unwanted change and potential programming errors into a cumulative package where code quality has the highest priority. When you order the cumulative PTF package, you also receive the most recent database PTF group and the HIPER PTF group.

How often a cumulative package is available depends on the stage of the i5/OS release life cycle. During the first six months or so of general availability for a new release, a cumulative package can be available as often as every four to six weeks. After that time, cumulative packages are scheduled on a quarterly basis. After the i5/OS release has been available for a period of time, the frequency might decrease again. The frequency of availability depends on the number of new fixes to be added to the package.

You should install cumulative PTF packages quarterly in dynamic environments and less frequently in stable ones. Also consider installing cumulative fix packages before making major hardware or software changes to your environment.

### Related tasks


“Install cumulative PTF packages” on page 29

This topic describes the steps for installing a cumulative PTF package from a physical or virtual device.

## Fix groups:

A *PTF group* or *fix group* is a name that is used to order and manage a group of logically related PTFs.

A PTF group or fix group consists of a list of PTFs that are defined for the purpose of managing those PTFs as one entity. A PTF group can identify other PTF groups called *related PTF groups*.

IBM creates and maintains a set of PTF groups for certain functions on the system. PTF groups are available for each supported i5/OS release and are updated periodically. For a complete listing of PTF groups, see the preventive service planning information at the IBM eServer iSeries Support  Web site.

The cumulative PTF package is shown as a PTF group on the WRKPTFGRP display and in the Management Central fix group inventory. The cumulative PTF package is identified as a PTF group named in the format *SF99vrm* where *vrm* stands for version, release, and modification of the operating system. However, some operations that are supported by Management Central are not allowed for this fix group. These operations include sending fixes, sending and installing fixes, and installing fixes.

In iSeries Navigator, you can perform the following tasks for fix groups: send, send and install, or install. When you copy your fixes from media, fix groups are automatically copied from media when you select All products or All supported products for Fixes to copy.

A *related fix group* is a fix group that is listed in another fix group. The fixes in the fix group as well as the fixes in all related fix groups are used to determine the overall status of the fix group. When you select a fix group to send and install, the fixes from all related fix groups are also sent and installed.

For information about the tasks that you can perform with PTF groups, see the following items:

#### **Order PTF groups**

You can order PTF groups through several different methods. To determine the best way for you, refer to “Order fixes” on page 23.

#### **Manage PTF groups**

Manage your PTF groups with the Work with PTF Groups (WRKPTFGRP) command, the Copy PTF Group (CPYPTFGRP) command, or the fix group function that is available from iSeries Navigator

#### **Display properties for fix groups**

Use iSeries Navigator to display properties for fixes and fix groups. Refer to “Display properties of a fix or fix group” on page 53.

#### **Create PTF groups**

Create your own fix group with the Create PTF Group (QpzCreatePtfGroup) API.

#### **Related reference**

Work with PTF Groups (WRKPTFGRP) command


Copy PTF Group (CPYPTFGRP) command

Create PTF Group (QpzCreatePtfGroup) API

#### **Service packs:**

A *service pack* is a collection of code fixes (not PTFs) for iSeries Access for Windows® products that is contained in a single i5/OS PTF.

For specific service pack information, see the following:

- IBM eServer iSeries Access Web site   
This Web site tells you what service packs are available, how you can be notified when a new service pack is available, and how to order and download a service pack.
- Install service packs  
This topic tells you how to check the service level, how to obtain the latest service pack, and how to install it.

## Fix cover letters

Cover letters provide information about the fixes that they accompany. They explain the contents of a fix, the problem that the fix resolves, special instructions that are associated with the fix, and prerequisites or corequisites that must also be installed on your system for the fix to function properly.

You can view your cover letters with any of the following methods:

- Display PTF Cover Letter (DSPPTFCVR) command
- Display PTF (DSPPTF) command
- Fixes inventory in iSeries Navigator. (Refer to “Display an inventory of fixes on your server with Management Central” on page 53.)

You receive cover letters electronically as physical file members or on the particular media with the fixes. The cover letters are stored in members of file QAPZCOVER in library QGPL and are named Qppppppppxx, where pppppppp is the fix ID or a timestamp depending on what the fix save file was named. The xx are the last two digits of the language code of the cover letter. For cover letters in English, the last two digits of the language code do not appear, and the member name is the same as the corresponding fix save file name. For a list of tasks associated with fix cover letters, see “Work with fix cover letters” on page 56.

### Related reference

Display PTF Cover Letter (DSPPTFCVR) command

Display PTF (DSPPTF) command

### Sample fix cover letter and description of fields:

This figure shows an example of the contents of a typical fix cover letter.

The table, “Description of fields” on page 9, follows.

```
PTF/FIX #: SIxxxxx - IBM i5/OS
LICENSED PROGRAM: 5722SS1

-----
: SYSTEM  : RELEASE : LEVEL  : RECOMPILE : LIBRARY : MRI    : APAR   :
:         :         : MIN/MAX :           :         : FEATURE: FIXED  :
:         :         :         :           :         :         :        :
: iSeries : VxRxMx  : 00/00  : N         : QSYS   : NONE   : SExxxxx :
-----

PRE/CO-REQUISITE PTF/FIX LIST
-----
REQ  LICENSED   PTF/FIX  LEVEL
TYPE PROGRAM  REL   NUMBER  MIN/MAX  OPTION
-----
PRE  5722SS1   xxx  SIxxxxx  NONE     0000
PRE  5722999   xxx  MFxxxxx  NONE     0000
CO   5722SS1   xxx  SIxxxxx  NONE     0000
DIST 5722SS1   xxx  SIxxxxx  NONE     0000
DIST 5722SS1   xxx  SExxxxx  NONE     0000 (SEE MRI PTF/FIX LIST BELOW)

MRI PTF/FIX LIST
-----

APAR SExxxxx AFFECTS THESE LANGUAGES. IF YOU HAVE ANY OF THESE LANGUAGES
INSTALLED, INSTALL THE CO-REQUISITE MRI PTF THAT CORRESPONDS TO THE LANGUAGE(S)
INSTALLED ON YOUR SYSTEM.
-----

FEATURE                                LICENSED PTF/FIX
CODE   LANGUAGE                        PROGRAM  NUMBER
-----
```

2924 ENGLISH UPPER/LOWER CASE 5722SS1 SIxxxxx  
 2938 ENGLISH UPPERCASE DBCS 5722SS1 SIxxxxx  
 2984 ENGLISH U/L DBCS 5722SS1 SIxxxxx

DESCRIPTION OF PROBLEM FIXED FOR APAR SExxxxx :

-----  
 USERS CANNOT RECEIVE PTFS FOR PRODUCTS NOT INSTALLED  
 ON THEIR SYSTEMS.

CORRECTION FOR APAR 9959319 :

-----  
 ELECTRONIC CUSTOMER SUPPORT PROGRAM CODE WILL BE CHANGED SO THAT PTFS WILL  
 BE REQUESTED EVEN IF THE CORRESPONDING PRODUCTS ARE NOT INSTALLED ON THE  
 REQUESTING SYSTEM.

CIRCUMVENTION FOR APAR SExxxxx :

-----  
 None.

ACTIVATION INSTRUCTIONS :

-----  
 None.

SPECIAL INSTRUCTIONS :

-----  
 None.

DEFAULT INSTRUCTIONS :

-----  
 THIS PTF MUST BE APPLIED AT IPL TIME.

SUPERSEDES

PTF/FIX NO(S). APAR TITLE LINE

-----  
 SIxxxxx OSP-RSTS36F-MSGCPA2C6C RESTORING ALL FILES FROM SYSTEM/34

## Description of fields

Field name	Description
PTF/Fix #	The alphanumeric identifier for the fix or Licensed Internal Code fix.
Licensed Program	The alphanumeric identifier for the licensed program.
System	The IBM system for which this fix is valid.
Level Min/Max	The lowest and highest level of the product that this fix can be installed on.
Release	The version, release, and modification number of the system for which this fix is valid. The format for version, release, and modification number is VxRxMx where x is a number between 0 and 9.
Recompile	Y (Yes) means a recompile of affected objects is necessary after this fix is applied. N (No) means a recompile is not necessary after this fix is applied.
Library	The library the fix is intended for.
MRI Feature	The numeric identifier for the language feature of the language sensitive object affected by the fix. None means language sensitive object is not affected.
APAR Fixed	The number of the authorized program analysis report (APAR) for which this fix was created.

Field name	Description
Requisite Type (REQ TYPE):	<p><b>PRE</b> Prerequisite PTF: The information about the fixes that must be applied on the system before this fix can be applied.</p> <p><b>CO</b> Corequisite PTF: The information about other fixes that must be installed along with this fix. The system will check to ensure all corequisite fixes are applied together.</p> <p><b>DIST</b> Distribution requisite: The information about other fixes that must be installed at the same time as this fix. The system will not verify that distribution requisites are applied together.</p> <p><b>MRI</b> MRI Requisite PTF: The information about other fixes that must be installed at the same time as this fixes. Select the fixes that correspond to the languages that you have installed on your system.</p>
Description of Problem Fixed	A brief description of the problem this fix fixes.
Correction	A brief description of what has been done to correct the problem.
Circumvention	A description, if applicable, of how to work around the problem and continue your operation without applying the fix.
Activation Instructions	Actions you must perform in order to activate fixes without an IPL (initial program load) of the system. Activation instructions are limited to actions that would normally be accomplished by an IPL of the system, such as stopping and restarting a subsystem, varying devices offline and back online.
Special Instructions	Any special information pertaining to this fix.
Default Instructions	Tells when the fix can be applied; either at the next IPL (delayed) or immediately.
Supersedes PTF/Fix No(s)	The numbers of the fixes that this fix replaces or supersedes.
APAR Title Line	The title of the authorized program analysis report (APAR) for the superseded fix.

## Fix save files

Save files allow you to distribute fixes to other systems in your network and therefore allow you to keep your systems current with the latest fixes.

A *save file* is a file that contains data in a form that is correct for transportation to another system. For software fixes (PTFs), a save file contains all the data needed to install (load and apply) the fix, or send it to other systems. In this case, the actions are performed against the save file for the fix, without requiring the original physical media on which the fix was originally delivered. If you want to distribute your fixes electronically, you must have the save files.

The Copy PTFs (CPYPTF) service attribute specifies whether to copy PTF save files and cover letters into \*SERVICE when PTFs are loaded from a tape or optical device. PTF save files must be in \*SERVICE when distributing PTFs to other systems or when using the Save System Information (SAVSYSINF) command. If you want to copy PTF save files and cover letters when PTFs are loaded from media, use the Change Service Attributes (CHGSRVA) command and specify CPYPTF(\*YES).



If the CPYPTF service attribute is set to \*NO, you can copy all or selected PTFs for installed and supported products from a device into PTF save files. You can use the Copy from Media function that is available from iSeries Navigator or the Copy Program Temporary Fix to Save File (QPZCPYSV) API. You must perform a copy function for PTFs that are received on media; otherwise, you cannot send your fixes to other systems.

Over time, save files and cover letters for fixes tend to accumulate. By cleaning up your save files and cover letters, you can make room on your system for other files. Consider deleting your save files after the fix has been permanently applied, the system has been saved (SAVSYS), and you no longer want to distribute the save file to another system. Use the Delete PTF (DLTPTF) command or the Management Central cleanup function. For instructions, see “Clean up fixes” on page 58.

**Related information**

Copy Program Temporary Fix to Save File (QPZCPYSV) API

**Fix status information**

The status of a PTF or fix indicates the activity of that PTF or fix within a product.

This topic shows you the descriptions of the statuses for fixes on your server, both from the perspective of iSeries Navigator and the Display PTF (DSPPTF) command.

**Note:** To help you decide whether to use the iSeries Navigator interface or the command interface to work with your fixes, go to “Determine which interface to use” on page 21.

**Related concepts**

“Where to find information about fixes” on page 16

Stay informed about fixes: which ones are available to you, what particular fixes can do in your environment, and which fixes may not be necessary for you. Use this information to find out where you can get the latest updates about fixes.

**Fix status descriptions using iSeries Navigator:**

iSeries Navigator provides a fix management function through Management Central to view the fix statuses.

The fix management function allows you to manage your fixes and fix groups with a graphical user interface. While many of the statuses are the same as those shown by the Display PTF (DSPPTF) command, some statuses are different. The following tables describe the fix and fix group statuses that are available in Management Central. For those statuses that end with the words *action pending*, the status represents either the ACN or PND suffixes that you find in the corresponding status description for the same fix when you use the DSPPTF command. The corresponding DSPPTF status is included in the table for those of you who are more familiar with the character-based interface but are now using iSeries Navigator.

*Table 3. Status for single fixes*

Management Central status	Description	DSPPTF status
Available	The fix is ready to install on the local system. It can exist as a save file, or it either was loaded (by using the LODPTF command) but not applied (by using the APYPTF command), or has been temporarily removed. To distribute the fix to other systems, the save file must exist on the system.	Save file only or Not applied

Table 3. Status for single fixes (continued)

Management Central status	Description	DSPPTF status
Cover letter	The cover letter for the fix is on the system, but the fix is not on the system.	Cover letter only
Damaged	The fix is damaged. If you have the save file, you can uninstall or install the fix again. If you do not have the save file, you must get the save file and install or uninstall the fix again.	Damaged
Install at next restart	The fix will be installed the next time the system is restarted.	Not applied with IPL action set to Yes
Install permanently at next restart	The fix will be installed permanently the next time the system is restarted.	Temporarily applied with IPL action set to Yes or Not applied with IPL action set to Yes
Installed	The fix is installed. You can either uninstall it from the system or install it permanently. The fix is not a permanent part of the system.	Temporarily applied
Installed permanently	The fix is installed permanently. You cannot uninstall it. Permanently installing a fix means that you can no longer revert to the old objects. The fix is now a permanent part of the system.	Permanently applied
Installed permanently - action pending	The fix is installed permanently, but you need to perform an action before the fix is active. Look at the cover letter to determine the required actions. If you have done the actions necessary to make the fix active, you do not have to restart the system at this time. The action pending status will be updated the next time that the system is started.	Permanently applied - PND or Permanently applied - ACN
Installed - action pending	Indicates that the fix is installed, but that you need to perform an action before the fix is active. Look at the cover letter to determine the required actions. If you have done the actions necessary to make the fix active, you do not have to restart the system at this time. The action pending status will be updated the next time that the system is started.	Temporarily applied - PND or Temporarily applied - ACN
On order	The fix has been ordered but has not yet arrived on the system.	On order
Superseded	A later fix exists on the system, but it may not be applied.	Superseded
Supported only	The fix exists on the system as a save file but cannot be installed on the system. A supported only fix can only be distributed to and installed on other systems.	Save file only

Table 3. Status for single fixes (continued)

Management Central status	Description	DSPPTF status
Uninstall at next restart	The fix will be uninstalled the next time the system is restarted.	Temporarily applied with IPL action of Yes or Not applied with IPL action of Yes
Uninstall permanently at next restart	The fix is installed or available and will be uninstalled permanently the next time the system is restarted.	Temporarily applied with IPL action of Yes or Not applied with IPL action of Yes
Uninstalled permanently - action pending	The fix is uninstalled permanently, but you need to perform an action before the fix is no longer active. Look at the cover letter to determine the required actions. If you have done the actions necessary, you do not have to restart the system at this time. The action pending status will be updated the next time that the system is started.	Permanently removed - PND or Permanently removed - ACN
Uninstalled - action pending	Indicates that the fix is uninstalled, but that you need to perform an action before the fix is no longer active. Look at the cover letter to determine the required actions. If you have done the actions necessary, you do not have to restart the system at this time. The action pending status will be updated the next time that the system is started.	Temporarily removed - PND or Temporarily removed - ACN

Table 4. Status for fix groups

Management Central status	Description	WRKPTFGRP status
Not applicable	All fixes that are identified by the fix group and all its related fix groups are for products that are not installed and not supported on this system. No actions for the identified fixes are available.	Not applicable
Supported only	No fixes that are identified by the fix group or any of its related fix groups are for products that are installed on this system. However, at least one fix is for a product, release, option, and load ID that is supported on this system.	Supported only
Not installed	At least one fix that is identified by the fix group or at least one of its related fix groups is for a product that is installed on this system, and neither the fix nor a superseding fix is installed or permanently installed.	Not installed

Table 4. Status for fix groups (continued)

Management Central status	Description	WRKPTFGRP status
Installed	All the fixes that are identified by the fix group or any of its related fix groups for a product that is installed on this system are installed, permanently installed, or superseded. If a fix is superseded, the superseding fix is either installed or permanently installed.	Installed
Error	The fix group information is in error. Either delete the fix group with the Work with PTF Group (WRKPTFGRP) command or replace the fix group information that is currently on the system.	Error
Not found	Indicates that the related fix group identified by the fix group that you are displaying properties for is not found on the system. This status is shown only when you are viewing the properties of a related fix group. You will not see this status when you view the fixes inventory.	Not found
Unknown	The fix group status cannot be resolved because the fix group identifies one or more related fix groups that either are not found on the system or are in error. No actions for the identified fixes are available because the action will not succeed for all of the fixes identified by the fix group.	Unknown

**Fix status descriptions using the command interface:**

- | The Display PTF (DSPPTF) command shows fix status descriptions.

You can manage your PTFs with the options available from the GO PTF menu. Option 5 (Display

- | Program Temporary Fix) shows you the status of your PTFs. In addition to the status of a PTF, you can also find out general information about a PTF.

The possible fix statuses are described in the table that follows. Note that the pending and action status indicate that additional actions need to be taken to make the PTF active or inactive. PND means the PTF status will be updated after the actions are taken. ACN means the PTF status will not be updated until the next IPL as no exit program was provided to verify that the actions were actually performed. Temporarily applied - ACN does not mean that the fix is not in effect. It means that the system cannot verify that it is in effect.

Status	Description
On order	Ordered but not received by the system.
Cover letter only	Indicates only the cover letter for the PTF has been received.
Save file only	PTF exists in a save file in library QGPL. The PTF has never been loaded, or has been permanently removed.

Status	Description
Not applied	PTF has been loaded but not applied, or has been temporarily removed.
Not applied - IPL	PTF has been loaded but not applied. It is set to be applied at the next IPL. It requires a server IPL to enable the PTF to be actively running on the system.
Temporarily applied	A temporary fix that can either be removed from the system or permanently applied. The PTF is not a permanent part of the system.
Temporarily applied - IPL	A temporary fix that requires a server IPL to be actively running on the system. The PTF is not a permanent part of the system.
Temporarily applied - PND	The PTF is applied temporarily, but an action is necessary to make the PTF active. This field is updated when the PTF details are displayed.
Temporarily applied - ACN	The PTF is applied temporarily, but an action is necessary to make the PTF active. This field is not updated until the next IPL. If you have done the actions necessary to make the PTF active, it is not necessary to do an IPL at this time. This action pending field will be cleared on the next IPL.
Permanently applied	PTF is a permanent part of the system.
Permanently applied - IPL	The PTF is a permanent part of the system. A server IPL is required for the PTF to be actively running on the system.
Permanently applied - PND	The PTF has been applied permanently, but an action is necessary to make the PTF active. This field is updated when the PTF details are displayed.
Permanently applied - ACN	The PTF has been applied permanently, but an action is necessary to make the PTF active. This field is not updated until the next IPL. If you have done the actions necessary to make the PTF active, it is not necessary to do an IPL at this time. This action pending field will be cleared on the next IPL.
Temporarily removed	Removed temporarily
Temporarily removed - PND	The PTF has been removed, but an action is necessary to make the old code active. This field is updated when the PTF details are displayed.
Temporarily removed - ACN	The PTF has been removed, but an action is necessary to make the old code active. This field is not updated until the next IPL. If you have done the actions necessary to make the PTF active, it is not necessary to do an IPL at this time. This action pending field will be cleared on the next IPL.
Permanently removed - IPL	The PTF has been permanently removed from the system, but the code is still running on the system. A server IPL is required for the PTF to no longer be actively running on the system.
Permanently removed - PND	The PTF has been removed permanently, but an action is necessary to make the old code active. This field is updated when the PTF details are displayed.

Status	Description
Permanently removed - ACN	The PTF has been removed permanently, but an action is necessary to make the old code active. This field is not updated until the next IPL. If you have done the actions necessary to make the PTF active, it is not necessary to do an IPL at this time. This action pending field will be cleared on the next IPL.
Superseded	A later PTF exists on the system, but it may not be applied. If this PTF has been superseded, display the PTF details to determine the PTF number that supersedes this PTF, and then display that PTF to determine its status.
Damaged	A PTF object cannot be found (perhaps accidentally removed). The PTF must be loaded again before you can apply it or remove it.

### Fix order status:

- | You might have an occasion to report a hardware or software problem, which can result in a PTF being created to fix your problem. With the Work with Problem (WRKPRB) command, you can track the status of your problem.
- | To find the status of your problem, follow these steps:
  1. On any command line, type WRKPRB. Press Enter.
  2. All fixes that you requested and have been sent (either electronically or through the mail) are identified in the Problem Description column as Fix Request on the Work with Problems display.
  3. Use option 5 (Display details) for the problem with the problem description Fix Request.
  4. Press F9 (Display PTFs) on the Display Problem Details display. All fixes related to the problem you selected are shown on the Display PTF information display. This includes the fixes you ordered, in addition to any others requested that are not already on your system.

#### Related tasks

Report a problem

### Where to find information about fixes

Stay informed about fixes: which ones are available to you, what particular fixes can do in your environment, and which fixes may not be necessary for you. Use this information to find out where you can get the latest updates about fixes.

As a system administrator, one of your responsibilities is to maintain your IBM i5/OS server. Part of that task involves knowing where to find information about fixes. You need to find out if there are any special instructions that relate to installing your fixes. You can avoid problems if you follow a fix maintenance strategy.

#### Related concepts

“Fix status information” on page 11

- | The status of a PTF or fix indicates the activity of that PTF or fix within a product.

#### Related tasks

“Install cumulative PTF packages” on page 29

This topic describes the steps for installing a cumulative PTF package from a physical or virtual device.

### Fix summary lists:

IBM service sends you only the fix that you ordered. If that fix is superseded by another fix, you need to know which superseded fix to order. Use the Fix summary list to make that identification.

A fix summary list is a cover letter that contains a list of fixes that are available by IBM licensed program category. The fix summary list identifies the current fix package and what package each fix was included in. The IBM software support center updates the summary list regularly.

You should be aware that when you order a fix, IBM service does not search through the fixes to determine which one is the latest level. For example, if you order a fix that is superseded by another fix, IBM service will send you only the fix that you ordered instead of the superseding fix. You need to use the summary list to identify the fix you need to order. Scan the summary list for fixes that replace the fix in question and then order the fix.

- | To make sure that you order any fixes for the new release that you had at the previous release, review
- | the fix cross-reference summary list. To order the fix summary list, enter the following command:

```
SNDPTFORD SF97vrm
```

- | The term *vrm* is the version, release, and modification level. For version 5 release 4 modification 0, use
- | 540.

- | The following text is an example of a fix summary list.

PTF/ FIX #	PKG#	AVAIL. DATE	ABSTRACT	REPLACED BY
MF25575	BASE	04/27/01	LIC-DB-MSGCPF5109 AND MSGSQL0901 ARE RECEIVED RUNNING SAP400	MF27014 D
MF25895	BASE	04/25/01	TCPIP ACCEPT() FAILS AFTER SECOND LISTEN(MF26296 T ) ISSUED	MF26296 T
MF25900	BASE	04/26/01	OSP SOCKET MODULE TO BE RECOMPILED WITH PROFILING	MF27337 M
MF25901	BASE	04/26/01	LIC ADDITIONAL DIAGNOSTIC DATA FOR SRC B6000103	MF27432
MF25902	BASE	04/26/01	OSP VIRTUAL CONTROL PANEL SECURITY CHECK CORRECTION	MF27341 S
MF25911	BASE	04/27/01	LIC-INCORROUT JAVA.NET.SOCKET SEND AND RECEIVE BUFFER SIZE	MF27465
MF25916	BASE	04/26/01	INCORROUT-HLIC-94XXDIAG INCORRECT ARRAY SIZE	MF27217
MF25917	BASE	04/27/01	OSP-TCPIP LINK ERROR UNDETECTED BY TCPIP ON GIGABIT ETHERNET OSP-TCPIP VL07000070 AFTER FRAME RELAY LINK ERROR	MF27361 ET
SI00596	1114	08/26/01	FIX *BNDDIR OF ILE COBOL COMPILER	SI01494

### Fix cross-reference summary lists:

Use this summary list to make sure you order any fixes for the new release that you had at the previous release.

The *fix cross-reference summary list* itemizes fixes from an earlier release that are included in the current release. Use this list to make sure you order any fixes for the new release that you had at the previous release, but are not included in the list. These fixes will not have the same number, but they correct the same problem.

- | To order this list electronically, select the version and release of the operating system you are moving
- | from and use the corresponding command. See the Send PTF Order (SNDPTFORD) command table for
- | the fix cross-reference summary in "Order fixes using the Send PTF Order command" on page 24.

### Preventive service planning information:

Preventive service planning (PSP) information contains the latest information that is applicable to your hardware or software. PSP information should be reviewed before you install a licensed program, a cumulative PTF package, or hardware.

Effective use of PSP information is an important element of your fix management strategy. PSP information is provided by the IBM software support center for you to use when installing a licensed program, cumulative PTF packages, or hardware. You should review this information before you do any software installations to stay informed about potential conditions that could impede your software installation process. You can also use the PSP information to order preventive service planning information and review the recommended High Impact PERvasive (HIPER) fixes periodically or you can order the HIPER PTF group. The HIPER PTF group is updated every other week. Be sure to use the most recent edition of the PSP information as the IBM software support center provides frequent updates.

To print PSP information that you have ordered and downloaded to your server, use the instructions in "Display and print fix cover letters" on page 57. The PSP information is placed in QAPZCOVER when it is sent to you.

**Related information**

PSP Web site

IBM eServer iSeries Support

*How to obtain preventive service planning information:*

You can obtain preventive service planning (PSP) information using any of these methods.

- **Obtain PSP information on the Web**

You can go directly to the PSP Web site or you can access the IBM eServer iSeries Support home page. If you go to this Web site, you can find the PSP information in the Technical Databases category.

- **Order PSP information with scheduled cumulative PTF packages**

Cumulative PTF packages are released on a scheduled basis for those users who want to install fixes for preventive purposes, in other words, to minimize potential problems. If you choose to order and install the cumulative PTF package on a regular basis, the recommended time is that you do it on a quarterly basis. To order PSP information that is associated with the current cumulative PTF package, use the following commands:

**For licensed programs:** Enter SNDPTFORD SF98vrm

The *vrm* indicates the version, release, and modification level. For version 5 release 4 modification 0, use 540. You can also use the following:

PSP document	Command to order PTF
V5R2M0 software installation	SNDPTFORD SF98070
V5R3M0 software installation	SNDPTFORD SF98080
V5R4M0 software installation	SNDPTFORD SF98010

**For Licensed Internal Code:** SNDPTFORD MF98vrm

The letters *vrm* indicate the version, release, and modification level. For version 5 release 4 modification 0, use 540.

- **Obtain PSP information by using electronic customer support**

You can download PSP information to your iSeries server using electronic customer support.

- **Obtain PSP information from your software service provider**

If you do not have access to the Internet and do not have electronic customer support on your iSeries server, contact your software service provider for the latest PSP information.

*Contents of PSP information:*



Preventive service planning information is available for the following aspects of Licensed Internal Code and i5/OS maintenance:

- Licensed program installation
- Licensed Internal Code
- System equipment
- Cumulative PTF packages
- PTFs (fixes) in error (PE)
- High impact or pervasive (HIPER) problems
- General information
- Pre-HIPER text

PSP documents are categorized by topic as shown below. Review at least the software installation document and the general document for the release of the operating system that applies to you. The general document lists topics that are covered in other preventive service planning information documents that you may want to order if they apply to your system. PSP topics include the following:

#### **Installation information**

Information concerning upgrade and new installation, including information about cumulative PTF package installation. For more information, see “Cumulative PTF packages” on page 6.

#### **General information**

Hints or tips for working with fix packages or products. Typically, this information is not documented in other places. The information provided here was discovered after the release became available.

#### **PTFs in error**

Information about all fixes found to have a problem, the users that will be affected by the problem, and recommendations on how to avoid the problem. This section contains a list of fixes that are included on this cumulative package that, since shipment, have been found to be defective. You have two options: install the cumulative package without applying the fixes in error, or you can install the corrective fixes for the PTFs in error, if available. This section lists the defective fix, the users affected, the reason the fix is defective, and the recommended action to take.

#### **Service recommendations**

Detailed information about critical fixes you need to install. This section lists those High Impact Pervasive (HIPER) problems that have been discovered in the base code since shipment and not included in this cumulative package. As before, these recommendations should be reviewed based on your system’s setup and configuration. For more information, see the information on HIPER PTFs in the topic “Single fixes” on page 5.

The PSP information also contains a list of fix identifiers to order PSP information for Licensed Internal Code and system equipment, licensed programs installation, and PSP documents for older cumulative packages.

#### **Authorized program analysis reports:**

Authorized program analysis reports (APARs) are used to find out what problems have been identified that could result in potential problems. You can view APARs by component, by release, or see the full list.

An *authorized program analysis report (APAR)* is a request for the correction of a defect in a current release of an IBM-supplied program. It contains information about the problem from the problem record, any associated spooled files, the error log entry, and any available vital product data that exists for the licensed program. Vital product data is a structured description of a device or program. In this case the vital product data includes:

- The name of the licensed program, Licensed Internal Code group, or product
- The release and modification, and the program module names
- The national languages selected
- Other information can be included about the failing program.

One type of APAR is an *information APAR*. Information APARs are created when there is a need to provide worldwide access to information. Typically, information APARs are created to describe pervasive user errors, provide recovery actions for non-defect situations, or explain system operation.

| The IBM Software Support Center updates the APAR list regularly.

**Related information**

APAR list

## Plan your fix management strategy

| Use this information to establish a maintenance strategy to reduce the impact to i5/OS operations that result from unplanned outages or program failures.

| To most people, preventive maintenance means changing the oil in your car every 3000 miles, rotating the tires every 10 000 miles, and getting major maintenance done every 30 000 miles. This is the standard maintenance strategy automobile manufacturers suggest for new vehicles to prevent expensive problems.

IBM has similar guidelines to help you develop an effective program maintenance strategy. These guidelines are intended to provide basic program maintenance definitions, information, and direction for new users or for those who currently do not have a program maintenance strategy in place.

## Why an i5/OS maintenance strategy is recommended

Three out of four defect-related problems that are reported are rediscoveries of previously reported problems. Many users may have avoided the problem or outage if the available fix had been applied to their system. Unplanned outages have a tremendous impact on employee productivity, business operations, and revenue.

## Recommendations for setting up an effective maintenance strategy

| Unfortunately, there is no single recommendation for fix maintenance. Each system or environment must be assessed individually. Use the Fix Maintenance Advisor to help you determine a strategy for preventive maintenance that is based on your iSeries environment and applications. As you develop your strategy, here are some questions that you need to consider:

- What are you doing to prevent unexpected failures associated with i5/OS licensed programs, including interruptions to communications networks or unscheduled outages on your iSeries servers?
- Is your standard approach to program maintenance reactive, that is, you apply corrective fixes when failures occur?
- Do you have a preventive maintenance strategy in place for your iSeries servers?
- Is your system in a 24x7 production environment that requires maximum availability, or is it limited to testing new applications and used only during prime shift Monday through Friday by a limited set of programmers?
- Is your server on a new software release or on a release that has proven stable in your environment?
- What would be the tolerance and cost to the business of an unexpected system outage?

l Your preventive maintenance schedule might resemble the following tasks:

Time frame	Tasks
Daily	<ul style="list-style-type: none"> <li>• Run backup procedure</li> <li>• Apply individual fixes as needed</li> </ul>
Weekly	<ul style="list-style-type: none"> <li>• Order and review Preventive Service Planning (PSP)</li> <li>• Order and apply necessary HIPER PTFs</li> <li>• Print and review hardware error log (PRERRLOG)</li> </ul>
Monthly for a changing server or quarterly for a stable server	<ul style="list-style-type: none"> <li>• Order current cumulative PTF packages (SF99vrm) or PTF Group packages (SF99nnn) and apply</li> <li>• Do a complete system save</li> <li>• Perform system cleanup functions</li> </ul>
<p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. In a stable environment, think about installing the most recent cumulative PTF package every three to four months.</li> <li>2. Consider installing the most recent cumulative PTF package before making major changes to your system (hardware or software).</li> <li>3. If you require an excessive number of corrective service fixes, consider installing cumulative PTF packages more frequently.</li> </ol>	

When you establish a maintenance strategy, you can reduce the effect on the i5/OS operations that result from unplanned outages or program failures. When you use a program maintenance strategy that is appropriate for your environment, you can provide optimal system performance and availability.

**Related information**

- Guide to Fixes
- PTF Maintenance Strategy
- IBM eServer iSeries Support

## Determine which interface to use

l The iSeries server offers you many ways to connect to and communicate with the servers in your iSeries environment, and different methods exist to perform the tasks related to managing your fixes. To perform these tasks, you need to know whether it is best to use the character-based interface or iSeries Navigator.

If the communications protocol that you are using is Systems Network Architecture (SNA), you probably are already using the System Manager (5722-SM1) licensed program or you are performing your fix management tasks with the i5/OS commands and menus available from the iSeries server. If TCP/IP is the communications protocol that you use, you may discover that iSeries Navigator, the graphical user interface, is the way for you to manage and administer your iSeries servers.

Refer to the following table for more information about determining which interface to use for a particular task.

Task	Character-based interface	Management Central function
Order fixes and fix groups <sup>1</sup>	Yes, Send PTF Order (SNDPTFORD) command.	Not available.
Create fixes	Not available. <sup>2</sup>	Yes, with the generate fix function.

Task	Character-based interface	Management Central function
Install fixes from media	Yes, GO PTF option 8 or Install PTF (INSPTF) command, which allows you to install cumulative PTF packages and single fixes. If you need to distribute your fixes, use the Change Service Attributes (CHGSRVA) command to change the Copy PTFs service attribute to *YES.	Yes, with the Copy from media function and then the install action.
Install fixes received as save files	Yes, GO PTF option 8 or Install PTF (INSPTF) command. Specify *SERVICE for the device name.	Yes, as part of the send, install, and send and install actions for selected fixes or for fix group fixes. <sup>3</sup>
Display fix status	Yes, Display PTF (DSPPTF) command.	Yes, view the inventory and view the Status page of the Fix Properties.
Remove or uninstall fixes	Yes, Remove PTF (RMVPTF) command.	Yes, as part of the uninstall action.
Distribute fixes <sup>4</sup>	No	Yes, with the Compare and Update wizard or send and install action. <sup>3</sup>
Compare and update fixes	No	Yes, with the Compare and Update wizard or send and install action. <sup>3</sup>
Manage fix groups <sup>5</sup>	Yes, Work PTF Group (WRKPTFGRP) command allows you to list, display, and delete fix groups.	Yes, from the Fixes inventory or with the send, install, and send and install actions. However, you cannot delete fix groups from iSeries Navigator. <sup>3</sup>
Load and apply PTFs	Yes, Load PTF (LODPTF) command and Apply PTF (APYPTF) command.	Yes, with the install action. The install fixes action performs a load and apply. <sup>3</sup>
Create custom package	Yes, Copy PTF (CPYPTF) and Copy PTF Group (CPYPTFGRP) commands.	Not available.
Display cover letters	Yes, Display PTF Cover Letter (DSPPTFCVR) command and Display PTF (DSPPTF) command.	Yes, from the Properties page, or select a fix with a cover letter from the fixes inventory, right-click, and select <b>Cover Letter</b> .
Compare and update fixes	Not available.	Yes, with the Compare and Update wizard. <sup>3</sup>
Clean up save files and cover letters	Yes, Delete PTF (DLTPTF) command.	Yes, as part of the cleanup action.

<sup>1</sup>In addition to ordering fixes with the SNDPTFORD command, you can also order fixes from the Internet, by voice, or through electronic customer support.

<sup>2</sup>The System Manager licensed program allows you to create fixes for your own products. You can also use the Software Product APIs to create fixes.

<sup>3</sup>When the source system that you are using with the Management Central function has selected the cumulative PTF package fix group, the source system prevents you from attempting certain operations. These Management Central operations include sending fixes, sending and installing fixes, and installing fixes. The source system issues message CPDB7CB. The operation fails.

<sup>4</sup>The System Manager licensed program also distributes fixes to other systems in your network.

<sup>5</sup>Many of these tasks can also be done using the Software Product APIs.

To read about fix status descriptions, see these topics:

## iSeries Navigator fix status descriptions

iSeries Navigator provides a fix management function through Management Central. View the fix status descriptions as well as a comparison between the iSeries Navigator descriptions and the DSPPTF command status descriptions.

## Command interface fix status descriptions

View the fix status descriptions that are shown by the DSPPTF commands.

### Related concepts

iSeries Navigator

### Related reference

Software Product APIs

## Order fixes

There are a variety of methods you can use to order fixes: traditional i5/OS commands, electronic support, Web downloads, and more. Use this topic to determine the best way for you to order fixes in your individual business environment.

Before you begin ordering fixes, you should order and apply the latest cumulative PTF package. When you apply cumulative PTF packages, you reduce the number of fixes that you need to order and distribute later.

Some fix orders require special handling when received at an i5/OS service provider from a service requester. The following list identifies these special fix packages and indicates what they are:

- MF98vrm: Hardware Service Planning package
- SF98vrm: Preventive Service Planning package
- SF99vrm: Cumulative PTF package
- SF99xxx: PTF group
- SF97vrm: PTF Summary package

The *vrm* identifier stands for the version, release, and modification level of the operating system for which you are ordering the PTF package. You can order these PTF packages individually or as a part of a list. You can order most PTFs as part of a mixed list. A mixed list PTF order can contain operating system fixes, most licensed program fixes, and Licensed Internal Code fixes. Only fixes that begin with the prefix SH are not included in the mixed list. Order these fixes separately. Information APARs are coded with the *II* prefix and are not considered fixes. You must order those separately.

| Several methods exist that allow you to order your fixes: voice support, Fix Central, and the  
| SNDPTFORD command. Details are provided here for Fix Central and the SNDPTFORD command. You  
| can find more information about the other methods from the Ordering PTFs for your iSeries family  
| system Web page.

**Note:** In some special circumstances, you may want to create your own custom fix package for sending, loading, and applying fixes on servers in your network. For more information, see “Advanced fix installation: Build a custom fix package” on page 41.

### Related information

Ordering PTFs for your iSeries family system

## Order fixes using the Internet

Fix Central from IBM allows you to select, order, and download PTFs over the Internet. To use this facility, you must have an IBM userid and password.

The quickest method to receive PTFs is through the Internet. To receive PTFs from the Internet, connect at least one workstation to the iSeries server that is set up to use the Internet. Do not wait until an

emergency occurs and you need to request a PTF quickly, only to find you need to register and set up this function. Be prepared: register, set up, and request a PTF to test the process.

- | Fix Central offers different ways for you to download or order PTFs for your system. For more details, go
- | to the Fix Central Web site.

**Related information**

Fix Central

**Order fixes using the Send PTF Order command**

If you prefer the command interface, you can use the Send PTF Order (SNDPTFORD) command to order individual fixes, multiple fixes, PTF groups, PTF summary, or cover letters.

The SNDPTFORD command is used primarily to order and receive IBM-supplied fixes (or program temporary fixes, PTFs) for the iSeries server and IBM-supplied applications. You can use this command over the electronic customer support configuration that uses either an SNA connection or TCP/IP connectivity through universal connection.

- | **Note:** To use Universal Connection, the Remote control point parameter must be set to \*IBMSRV.

**Related concepts**

Configure Universal Connection

Work with Management Central

**Related information**

Set User Policy (QPDETPOL) API

Retrieve Policy Data (QPDETRTV) API

**Fixes and information you can order with the SNDPTFORD command:**

- | You can use the SNDPTFORD command to order a variety of fixes and related information. The
- | following table shows how to use the SNDPTFORD command to order the different types of fixes and fix
- | information. You might want to print and use this table as a reference when you order fixes.

- Separate or accompanying cover letters
- Individual fixes
- Multiple fixes
- Cumulative PTF packages
- PTF groups
- PTF summary
- Cross-reference summary list
- Preventive service planning tips

Fix information	Command
Specific fixes and cover letters	SNDPTFORD nnnnnnn <sup>1</sup>
Fix cover letter only	SNDPTFORD nnnnnnn <sup>1</sup> PTFPART(*CVRLTR)
Cumulative PTF packages	SNDPTFORD SF99vrn <sup>2</sup> or SNDPTFORD *CUMPKG <sup>3</sup>
PTF group	SNDPTFORD SF99nnn <sup>4</sup>
PTF summary list	SNDPTFORD SF97vrn <sup>2</sup>

Fix information	Command	
Fix cross-reference summary list	VRM520 to VRM530	SNDPTFORD SF97081
	VRM520 to VRM540	SNDPTFORD SF97082
	Licensed Internal Code V5R3M0 to Licensed Internal Code V5R3M5 <sup>5</sup>	SNDPTFORD SF97061
	VRM530 to VRM540 <sup>6</sup>	SNDPTFORD SF97085
PSP information for licensed programs	SNDPTFORD SF98vrm <sup>2</sup>	
PSP information for Licensed Internal Code and hardware devices	SNDPTFORD MF98vrm <sup>2</sup>	
<p><b>Notes:</b></p> <p><sup>1</sup> nnnnnn is the fix identifier. You can order up to 20 fixes at a time.</p> <p><sup>2</sup> v is the version, r is the release, and m is the modification level of the system. For version 5 release 4 modification 0, type 540.</p> <p><sup>3</sup> When *CUMPKG is specified, the latest level of the cumulative PTF package for the release of the operating system that is installed on the system is ordered.</p> <p><sup>4</sup> nnn is the fix identifier, which can be any number.</p> <p><sup>5</sup> This fix cross-reference summary lists contains only PTFs for Licensed Internal Code. For operating system and licensed program PTFs, refer to the operating system cross-reference summary list that corresponds to the release of your operating system.</p> <p><sup>6</sup>This includes Licensed Internal Code V5R3M5 to VRM540.</p>		

### Using the Send PTF Order command:

When you use the Send PTF Order (SNDPTFORD) command, the following process takes place:

1. From the iSeries server command interface, enter the **SNDPTFORD nnnnnnnn** command, where *nnnnnnnn* is the number of the individual fix you want to order. If you are using Management Central to manage your fixes, you may want to use the SNDPTFORD command from the system that you will use as your source system when you compare and update fix levels.
2. To process your PTF order in batch, use the Submit Job (SBMJOB) command. For example, you can specify the SNDPTFORD command for the CMD parameter.
3. Your order is then sent to IBM where the decision is made whether to distribute the fixes electronically or on media. If the fix files are too large to be delivered electronically, they are delivered on media.
4. The PTFs are sent electronically or put on media. If the fixes are placed on media, the media is packaged and the order is sent to the user.
5. When fixes are delivered electronically on your service support communications line, you have the option to receive the fixes either as save files or as optical image files. The type of file is determined by what you specify on the Delivery format (DLVRYFMT) parameter. Save files are placed in library QGPL. In most cases, the save file name is the fix identifier prefixed with a Q. For example, the save file for fix identifier SInnnnn is QSInnnnn. Optical image files contain PTFs and cover letters and are stored in the directory specified by the Image directory (IMGDIR) parameter.

**Note:** DLVRYFMT(\*IMAGE) is supported only when your system is configured to use a Universal Connection.

To order a cumulative PTF package with the SNDPTFORD command, do the following:

1. Type either SNDPTFORD \*CUMPKG or SNDPTFORD SF99VRM, where VRM is the version, release, and modification level of your licensed program. For example, for version 5 release 4 modification 0, type SNDPTFORD SF99540.
2. Verify the shipping information on the Verify Contact Information display. If any of the information is incorrect, change it and press Enter.
3. Select option 1 (Send service request now) on the Select Reporting Option display. This places the fix order.

### Specifying media for shipping a fix:

You can specify the media for any fixes that will be shipped instead of delivered electronically by doing the following:

1. On any command line, type WRKCNTINF.
2. Press Enter. The Work with Support Contact Information display appears.
3. Select **Option 2**.
4. Press Enter. The Work with Local Service Information display appears.
5. Select **Option 2**.
6. Press Enter. The Change service contact information display appears.
7. Page down to the last display.
8. Specify the fix medium type.
9. Press Enter.

The WRKCNTINF command is used in conjunction with the DELIVERY parameter on the SNDPTFORD command. If you specify DELIVERY(\*ANY), fixes are sent by any available method. If you specify DELIVERY(\*LINKONLY), you may not receive your order if the size of your fixes exceeds the transmit limit of the service link.

### Additional considerations:

Keep the following points in mind when using the SNDPTFORD command:

- When you order a fix that has been replaced (superseded) with another fix, you receive the ordered fix, not the replacement fix. To identify fixes that have been replaced (superseded), consult the fix summary list.
- When you order a fix for a product that is installed on your system, you will receive the ordered fix and its requisite fixes.
- If you order a fix for a product that is not installed on your system, you will receive only the fix that you ordered. If you use the Display Program Temporary fix (DSPPTF) command on the fix you just ordered, you will receive the following message: PTF 5722xxx-SIxxxxx is not found. This message means that the fix is for a release of the product that is not installed on your system. Contact your service provider for the correct fix number. To avoid this situation, you can add support for a product.
- Use the Set User Policy (QPDETPOL) and Retrieve Policy Data (QPDETRTV) APIs to set and retrieve the maximum PTF order size. This policy is used only when your system is configured to use a Universal Connection.
- If you specify \*SAVF delivery format and the corresponding save file is already on the system, a PTF is not reordered.
- PTFs that are too large for the service link are sent on the selected medium when delivery method (DELIVERY) is \*ANY. If the PTFs are too large to use service link only (\*LINKONLY), the command fails.

For information on ordering PTFs through IBM Technical Support, see “Order fixes using the Internet” on page 23.



## Install fixes

Use this topic to find scenario information about installing fixes, then follow the tasks required for installing fixes successfully.

This topic provides an overview of the tasks that you need to perform to ensure you install your fixes successfully. Each of the following tasks describes a specific part of the process for installing fixes. This topic is based on the use of the Install PTF (INSPTF) command or option 8 from the GO PTF menu.

- | Whether you are installing fixes on single systems, remote systems, or systems with logical partitions,
- | you must follow a series of steps to effectively install your fixes.

### Step 1: Review fix cover letters prior to fix installation

Determine if there are any special instructions that you should be aware of before you install your fixes.

You should always review your cover letters to determine if there are any special instructions. If you are installing a cumulative PTF package, you should read the instructions that come with that package. If it is not a cumulative package, you should display and print your fix cover letters because they can contain special instructions. If you read your cover letters, you can avoid problems that could result in time-consuming recovery.

If there are any preinstallation special instructions in any of the cover letters, follow those instructions first.

### Step 2: Prepare your server to install fixes

An overview of the preparation tasks that you can perform on your servers to ensure a successful install, which includes determining if there are any special instructions.

Determine how to install your fixes. Some fixes can be applied without requiring an IPL. These fixes are called *immediate fixes*. Some fixes can be applied only during an IPL. These are called *delayed fixes*. Immediate fixes can also be applied during an IPL. You need to determine if you are installing any delayed fixes and when it is convenient for you to IPL your system to apply the fixes. The cover letter tells you if the fix is immediate or delayed.

Before you begin to install fixes, complete these tasks:

- Have a current backup of your user data, operating system, and licensed programs. If you have backed up the operating system and licensed programs since the last time you applied fixes, that backup is acceptable.
- Have all users sign off the system only if you are doing an IPL when you install the fix.
- | • For 8xx models, before applying a fix to the primary partition of a system with logical partitions,
- | power down the secondary partitions. See “Install fixes on systems with logical partitions” on page 37
- | for further information. For eServer 5xx models, see the Customer service, support, and
- | troubleshooting and the “Install fixes on systems managed by Hardware Management Console” on
- | page 38 topics.
- Be sure you have security officer (\*SECOFR) user class authority. You need it to do the rest of the install steps.
- Verify that your system is running on the B storage area. See the Determine the storage area topic for more information. Your server maintains two copies of all Licensed Internal Code: a permanent copy and a temporary copy. Read this topic to learn about the available storage areas.

#### Determine storage area before installing fixes:

- | This information defines storage areas A and B and describes how to determine which one to use when
- | you install fixes.

The system maintains two copies of all Licensed Internal Code on the system. One copy is considered the permanent copy and is stored on system **storage area A**. The other copy is considered the temporary copy and is stored on system **storage area B**. When the system is running, it uses the copy that was selected before the last IPL (initial program load).

#### *System storage areas A and B:*

A B in the Data display on the front panel of the system unit indicates that the next system IPL will be made from the B or temporary storage area. The B storage area contains any Licensed Internal Code fixes that have been temporarily or permanently applied. Temporarily applied Licensed Internal Code fixes can be applied permanently (copied to the A storage area) or be permanently removed.

For the system to use the latest Licensed Internal Code fixes that are temporarily applied, you must be using the B storage area. The B storage area is what you normally use. Select the A storage area if the IPL to the B storage area fails because of a temporarily applied Licensed Internal Code fix.

#### *Determining the storage area:*

1. On any command line, type **dspptf 5722999** and press **Enter**.
2. On the Display PTF Status display, the storage area is identified in the IPL source field. **##MACH#A** is the **A** storage area and **##MACH#B** is the **B** storage area.
3. If you are not running on the **B** storage area, type the following command on any command line and press **Enter**: **PWRDWN SYS \*IMMED RESTART(\*YES) IPLSRC(B)**

#### *Selecting the A or B storage area:*

You can change the storage area from the command line or the control panel:

1. On the command line, type **PWRDWN SYS \*IMMED RESTART(\*YES) IPLSRC(X)**, where **X** is the storage area you want to select. If you are using the control panel, continue with step 3.
2. If you are using Hardware Management Console (HMC), go to Changing the IPL type for an i5/OS logical partition for further instructions.
3. On the control panel, perform these tasks:
  - a. For systems with a mode button, set the system to the **Manual** mode. For systems without a mode button, start at step 3b.
  - b. Press the Increment/Decrement buttons until **02** is displayed in the Function/Data display on the control panel.
  - c. Press the Enter pushbutton on the control panel.
  - d. For systems with a mode button, press the Increment/Decrement buttons until the character that represents the storage area you want to use for your IPL source (**A** or **B**) appears in the Function/Data display. For systems without a mode button, press the Increment/Decrement buttons until you see **Normal (N)** and the character (**A** or **B**) for the IPL storage area you want to appear in the Function/Data display.
  - e. Press the Enter pushbutton on the control panel to save the IPL settings.
  - f. For systems with a mode button, set the mode to **Normal**.
  - g. Power off the system using option 4 (Power off the system and immediately power on) on the Power On and Off Tasks (POWER) menu. Wait for the system to power down and automatically start an IPL. You see the Sign On display when the IPL is complete. The storage area is now changed.

### **Step 3: Choose your fix installation scenario**

- 1 You can install many kinds of fixes including cumulative PTF packages, HIPER fixes, i5/OS and other licensed program fixes, and fixes for the Licensed Internal Code.

Factors that can influence the method you choose include your environment (logical partitions), how you received your fixes (electronically or on media), or the type of device that you want to use (image catalog).

### Install cumulative PTF packages:

This topic describes the steps for installing a cumulative PTF package from a physical or virtual device.

If you received a cumulative PTF package as save files, see “Install fixes received as save files” on page 30.

You need to order and install the current cumulative PTF package to keep your server at the most current fix level. Do this on a periodic basis according to your fix maintenance strategy or when you install a new release of a licensed program.

### Notes:

1. The cumulative PTF package automatically includes the most recent Database PTF group and HIPER PTF group.
2. In an effort to simplify the process for installing a cumulative PTF package from media, some special instructions might be automated during installation when possible.

It is important that you thoroughly read the installation instructions received with your package. The information provides any special instructions that you should be aware of before you install your cumulative PTF package. The steps that follow step 1 are part of the letter also. They are provided here as an overview of some of the steps that you need to do. To install cumulative PTF packages, follow these steps:

1. Read the installation instructions thoroughly and follow the instructions contained in it.
2. Select the storage area if you have not already done so. You should be running on the B storage area (B side) when installing the cumulative PTF packages.
3. If you received your cumulative PTF package as an image, see “Install fixes from an image catalog” on page 38.
4. Type GO PTF from any command line.
5. Type option 8 (Install program temporary fix package) and press Enter. The Install Options for Program Temporary Fixes display is shown.
  - Type *optyy*, where *optyy* is name of the optical device (for example, opt01) where you loaded the fix media.
  - If you want to automatically IPL your system after loading the fixes, type a Y (Yes) in the Automatic IPL field.
  - If you are not using an image catalog and have additional fixes to install at this time, type a 2 (Multiple PTF volume sets) in the Prompt for media field, and install the additional fixes.
  - Type Y for Other options. The Other Install Options display is shown.
  - Type 1 for Apply Type.
  - Type 1 for the PTF type.

**Note:** To prevent someone from unintentionally performing an IPL on your system when using the GO PTF option 7 or option 8, use the Change Service Attributes (CHGSRVA) command. Specify \*DLYALL for the PTFINSTYPE parameter to override the Automatic IPL field and the Apply type field on the GO PTF option 7 and option 8.

### Related concepts

“Cumulative PTF packages” on page 6

Cumulative program temporary fix (PTF) packages contain fixes for a given release of the i5/OS

| operating system. The fixes contained in a cumulative PTF package are for the Licensed Internal Code  
| and most licensed programs that can be installed on that operating system release.

“Where to find information about fixes” on page 16

Stay informed about fixes: which ones are available to you, what particular fixes can do in your environment, and which fixes may not be necessary for you. Use this information to find out where you can get the latest updates about fixes.

Schedule a system shutdown and restart

*Omitting individual fixes when you install a cumulative PTF package:*

| The omit function allows you to specify individual fixes that you do not want to install from the  
| cumulative package. A situation might exist where you received the latest cumulative package from IBM,  
| and the preventive service planning (PSP) information indicates that the package contains two defective  
| PTFs. In this situation you do not want to install the defective PTFs. To omit any PTFs, follow these  
| steps:

1. Type GO PTF on any command line.
- | 2. Select option 8 (Install Program Temporary Fix package) and press Enter.
3. On the Install Options for Program Temporary Fixes display, specify Y for the Other options field, and press Enter. The Other Install Options display is shown
4. Specify Y for the Omit PTFs field, and a value for the Apply Type field, and then press Enter. The Omit Program Temporary Fixes display is shown.
5. In the Opt Column, type a 1 next to each product and release for which you want to omit specific fixes from being installed, and press Enter. The PTFs to Omit display is shown for each product that was selected on the previous display. This display shows the list of fixes that are to be omitted from being loaded for the specified product and release.
6. To add fixes to the list on the PTFs to Omit display, type a 1 on the first line of the Opt column and specify the fix ID in the PTF ID column. Press Enter.
7. Repeat step 6 until you have specified all of the fixes you want to omit from being installed for the product and release. Press Enter again and repeat the procedure for the next product and release you selected on the Omit Program Temporary Fixes display. When you are done with the last product and release you have selected, the Omit Program Temporary Fixes display is shown again. The > symbol next to the product and release indicates that you have specified fixes to be omitted. Press Enter. The Confirm to Omit PTFs display is shown.
8. The Confirm to Omit PTFs display lists each of the fixes that have been specified to be omitted from being installed. If the list is correct, press Enter. Normal fix installation process continues from this point.

Remember, you can install fixes by scheduling a time to shut down and restart the system.

*Your next step:*

| Verify that the fixes are installed. See “Step 4: Verify fix installation” on page 40. If there are any  
| post-installation special instructions in the cover letter, follow those instructions at this time.

### **Install fixes received as save files:**

| Fixes are either sent to your system over the electronic customer support service link or received on  
| distribution media such as CD-ROM, depending on the size and number of fixes that you ordered.

| If the fixes are sent over the electronic customer support service link, you can select to receive them as  
| save files or as images. If you receive them as save files, they are stored in library QGPL. You can use  
| either Management Central or the GO PTF menu to install fixes that you received as save files. For fixes  
| received as images, refer to “Install fixes from an image catalog” on page 38.

| **Note:** If you receive PTF save files by any other method, you can use either the Update PTF Information  
| (UPDPTFINF) command or the Log Program Temporary Fix Information (QPZLOGFX) API to log  
| the fix information. The fix information must be logged to install the fix or distribute it to remote  
| systems.

| Because Management Central uses inventory for many of its tasks, the inventory becomes out of date  
| after actions are performed on endpoint systems that change the state of an item in the inventory. You  
| need to ensure that your inventory is current before you perform the install fixes task with Management  
| Central.

#### **Related reference**

Log Program Temporary Fix Information (QPZLOGFX) API

#### *Install fixes with Management Central:*

| Before you install fixes using Management Central, ensure that your inventory is current. Management  
| Central uses inventory for many of its tasks. The inventory becomes out of date after actions are  
| performed on endpoint systems that change the state of an item in the inventory.

1. In iSeries Navigator, expand **Management Central**.
2. Expand **Endpoint Systems** or **System Groups**.
3. Expand **Configuration and Service**.
4. Expand **Fixes Inventory**.
5. Select **All Fixes**, **Fix Groups**, or a specific product to choose which fix or fix group you want to install. The status of the fix or fix group must be *Available*, which means that the fix is ready to install.

#### *Install fixes with GO PTF menu:*

1. Type GO PTF on any command line.
  2. Select option 8 (Install program temporary fix package) on the Program Temporary Fix (PTF) display. The Install Options for Program Temporary Fixes display is shown.
    - Type \*SERVICE for the device.
- | • If you do not want to install certain fixes, you can omit them by using the procedure identified in  
| the “Install cumulative PTF packages” on page 29 topic.

#### *Notes:*

- You must be running on the B storage area to use any temporarily applied Licensed Internal Code fixes. Temporarily applied Licensed Internal Code fixes can be applied permanently (copied to the A storage area). To permanently apply delayed or immediate Licensed Internal Code fixes, you must be running from the B storage area. These fixes can be permanently applied without an IPL.
- | • When running on the A storage area, the system will automatically apply the Licensed Internal Code  
| fixes immediately. For Licensed Internal Code fixes that will be applied immediately without an IPL,  
| you can find more information in the “Advanced fix installation: Apply fixes” on page 46.
- | • For immediate i5/OS fixes that will be applied immediately without an IPL (initial program load), see  
| the instructions in “Advanced fix installation: Apply Licensed Internal Code fixes without an IPL” on  
| page 50.
- To prevent someone from unintentionally performing an IPL on your system when using the GO PTF option 7 or option 8, use the Change Service Attributes (CHGSRVA) command. Specify \*DLYALL for the PTFINSTYPE parameter to override the Automatic IPL field and the Apply type field on the GO PTF option 7 and option 8.

#### *Your next step:*

| Verify that the fixes are installed. See “Step 4: Verify fix installation” on page 40. If there are any  
| post-installation special instructions in the cover letter, follow those instructions at this time.

## Install fixes from media:

- | Fixes are either sent to your system over the electronic customer support service link or received on
- | distribution media such as CD-ROM.

When you receive fixes on physical media or as an image, you can use either Management Central or the GO PTF menu to install the fixes. However, using Management Central is more complex because installing fixes from a device is not directly supported by Management Central. You must first copy the PTFs from media before you install the fixes.

### Related reference

Log Program Temporary Fix Information (QPZLOGFX) API

#### *Install fixes with Management Central:*

1. In iSeries Navigator, expand **Management Central**.
2. Expand **Endpoint Systems** or **System Groups**.
3. Expand **Configuration and Service**.
4. Expand **Fixes Inventory**.
5. Select **All Fixes** or a specific product to choose which fix's save file you want to copy from media. The **Copy from Media** dialog allows you to copy the save file for a fix from a tape or optical device onto the system. Fix groups are automatically copied from media when you select All products or All supported products for Fixes to copy.
6. Collect your fixes inventory again.
7. Select **All Fixes**, **Fix Groups**, or a specific product to choose which fix or fix group you want to install. The status of the fix or fix group must be **Available**, which means that the fix is ready to install. You can install the fixes if the corresponding products are installed on the system.

#### *Install fixes with GO PTF menu:*

1. Type GO PTF from any command line.
- | 2. Select option 8 (Install program temporary fix package) and press Enter. The Install Options for  
| Program Temporary Fixes display is shown.
  - | • Type *optyy*, where *optyy* is the name of the optical device (for example, opt01) where you loaded  
| the fix media.
  - | • If you do not want to install certain fixes, you can omit them by using the procedure identified in  
| the "Install cumulative PTF packages" on page 29 topic.

#### *Notes:*

- You must be running on the B storage area to use any temporarily applied Licensed Internal Code fixes. Temporarily applied Licensed Internal Code fixes can be applied permanently (copied to the A storage area). To permanently apply delayed or immediate Licensed Internal Code fixes, you must be running from the B storage area. These fixes can be permanently applied without an IPL.
- | • When running on the A storage area, the system will automatically apply the Licensed Internal Code  
| fixes immediately. For Licensed Internal Code fixes that will be applied immediately without an IPL,  
| you can find more information in the "Advanced fix installation: Apply fixes" on page 46 topic.
- For immediate i5/OS fixes that will be applied immediately without an IPL (initial program load), see the instructions in "Advanced fix installation: Apply fixes without an IPL" on page 49.
- | • To prevent someone from unintentionally performing an IPL on your system when using the GO PTF  
| option 7 or option 8, use the Change Service Attributes (CHGSRVA) command. Specify \*DLYALL for the  
| PTFINSTYPE parameter to override the Automatic IPL field and the Apply type field on the GO PTF  
| option 7 and option 8.

#### *Your next step:*

- | Verify that the fixes are installed. See “Step 4: Verify fix installation” on page 40. If there are any
- | post-installation special instructions in the cover letter, follow those instructions at this time.

### **Distribute fixes to multiple servers with iSeries Navigator:**

If you have a network of iSeries servers that you want to keep at the same fix level, find out how simple your servers are to manage when you use the Compare and Update wizard. Find out how to install your fixes on remote systems with iSeries Navigator.

After you have received your fixes, you can use iSeries Navigator to distribute your fixes to other servers in your network. In the past, object distribution and Systems Network Architecture distribution services (SNADS) were the choices when you wanted to send objects. If you are in a TCP/IP environment, you can now use the iSeries Navigator graphical interface function of Management Central to send and distribute your fixes.

To understand how a network is set up, see the following list for a description of the different roles. A single system can assume more than one role. For example, the same system can be the central system, the source system, and a model system.

#### **Central system**

Central system directs and tracks activity in your environment. It has an active iSeries Access connection from your graphical client, and it is currently selected as the central system. Its server and inventory provide your view of the Management Central tasks and endpoints.

#### **Endpoint systems**

Endpoint systems are the systems that you are managing in your environment. The endpoint systems are controlled by the central system. The endpoint systems were discovered or created on your central system.

#### **Source system**

This is the system from which items are sent when performing a task. The source system is the source of the item that is sent. This is the system that you have selected to be the repository for the save files for the fixes that you will distribute to your other servers.

#### **Target system**

This is the system to which items are sent when performing a task. The target system is the destination of the item that is sent.

#### **Model system**

This is the system that is set up exactly the way you want it with regard to installed fixes. It has the fixes installed that you decided should be installed. You want the other systems that you are managing to have the same fixes installed as the model system. When you use the Compare and Update wizard, you make managing your fixes a lot easier.

#### *Send and install fixes:*

Use iSeries Navigator to send your fixes to remote systems and install them.

- You can distribute some or all of the fixes that you receive to a remote system with Management Central.
- | However, you must have the save files to distribute the fixes. If you receive PTFs on media, you can use
  - | the Copy from Media function available from iSeries Navigator to place the save files for the fixes onto
  - | your source system. If you already installed the PTFs from media and the Copy PTFs (CPYPTF) service
  - | attribute was set to \*YES, the save files have already been placed onto your system.

1. “Copy fixes from media” on page 34.
2. Collect your fixes inventory after you have copied the fixes. Right-click your source system, select **Inventory**, and then select **Collect**.
3. Select **All Fixes**, **Fix Groups**, or a specific product to choose which fix or fix group you want to send and install.

4. Follow the wizard's instructions to send and install the selected fixes or fix groups.

**Note:** When the source system that you are using with the Management Central function has selected the cumulative PTF package fix group, the source system prevents you from attempting certain operations. These Management Central operations include sending fixes, sending and installing fixes, and installing fixes. The source system issues message CPDB7CB. The operation fails.

| To find out how you can add fix support on your source system for a product that is installed on a server  
| in your network but not installed on your source system, see "Add fix support for a software product."

*Your next step:*

| To find information about the next steps for installing fixes on your servers, refer to "Step 4: Verify fix  
| installation" on page 40.

*Copy fixes from media:*

Management Central provides the ability to copy fix save files from media, which facilitates the storing of fix save files into service on your source system.

| You need the save files if you want to distribute fixes throughout your network. When you load and  
| apply fixes from media (using GO PTF option 8), the save files are copied to the system only if the Copy  
| PTFs (CPYPTF) service attribute is set to \*YES. If the Copy PTFs (CPYPTF) service attribute is set to \*NO,  
| you must copy the fix save files from media using this function to distribute them to other systems.

To copy from media, follow these steps:

1. Expand **Management Central**.
2. Expand the system onto which you want to copy the fix save files for distribution. This is the system you have chosen to be your source system. It can also be your model system.
3. Expand **Configuration and Services**, and then expand **Fixes Inventory**.
4. Right-click **All products** or the product for which you want to copy fixes. Fix groups are automatically copied from media when you select All products or All supported products for Fixes to copy.
5. Select **Copy from media**.
6. Complete the fields by using the online help.
7. Click **OK**. You see the Copying from Media window as the fixes are copied into save files.

After you have copied the fixes, you should collect your fixes inventory again. Right-click your source system, select **Inventory**, and then select **Collect**. Once you have collected the inventory, you can install the fixes or distribute them to other systems.

| If a software product is not installed on your source system, you can still keep its save files on your  
| source system for distribution to the systems that you manage by adding support for installed products.  
| To do so, you must designate the product as supported. The Copy from Media function gives you the  
| option of designating products as supported. For more information, see "Add fix support for a software  
| product."

*Add fix support for a software product:*

| The function to add fix support for products gives you the ability, as a service provider, to support a  
| product that is not installed on your system.

| As a service provider, you manage many remote systems in your network. Each remote system has  
| different products installed. As the service provider on the source system, you do not want to have to



install all the products on your source system to provide support to your remote systems. From a financial perspective this can be expensive if you had to have licenses for each one of those products.

**Notes:**

- When you use the compare and update function with a model system, it compares only the fixes that are installed. The function does not use fixes that exist as save files only.
- Products that are installed on your system are not automatically supported after an upgrade to a new release. If you want to keep the PTF save files for currently installed products after an upgrade, add support for your currently installed products before the upgrade.

To add support for a product, follow these steps:

1. Expand **Endpoint Systems**.
2. Expand the endpoint system where you want to add support for a product.
3. Expand **Configuration and Service**.
4. Expand **Software Inventory**.
5. Right-click **Supported Products** and select **Add Support**.
6. Click **Browse** to select from a list of all products in the central system inventory. When you select products from the list, the rest of the information is filled in for you.
7. When you have completed the appropriate fields, click **OK**.

The Add or Remove Product Support (QSZSPTPR) API can be used to add or remove support for installed products.

*Compare and update fixes:*

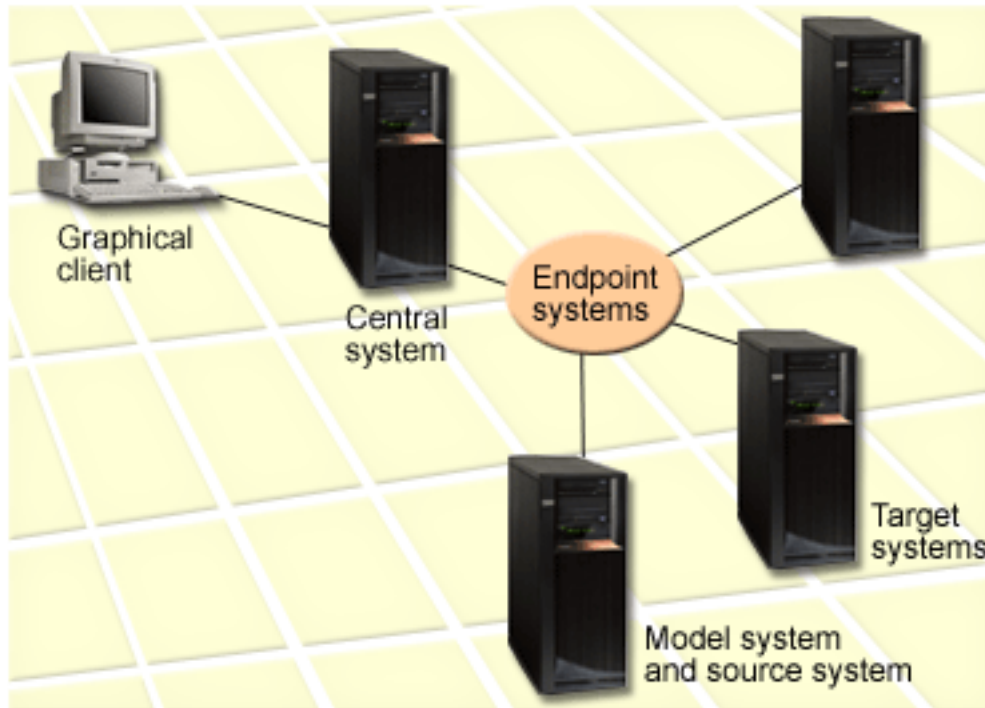
Use iSeries Navigator to compare fixes across your systems or networks of systems. You then have the choice to update your systems with the missing fixes. Find out how the Compare and Update wizard works.

iSeries provides tools and wizards to help you effectively manage your fixes. You will find the Compare and Update wizard to be very helpful. The wizard compares the fix levels of a single system or multiple systems to a model system. You can send the save files of the missing fixes from a source system and then install the fixes to ensure the systems have the same level of fixes. You can also choose which missing fixes you want to send. You can launch the Compare and Update wizard from an endpoint system, a system group, or from a system in your list of connections.

**Note:** Even though the Compare and Update wizard does not prevent you from comparing and updating fixes on systems at different cumulative levels, it is recommended that your systems be at the same cumulative level. Use the GO PTF menu to ensure that your systems are at the same level, and then use the Compare and Update wizard to work with a smaller number of differences. By following this recommendation, you ensure that the special instructions that accompany the cumulative PTF packages are followed.

To compare and update the levels of your fixes inventory, you need to define a model system and a source system. Your source system will have the fix save files on it. You will use your model system to compare against other systems in your network to ensure that your other systems have the same level of fixes like the model system. The Compare and Update wizard finds missing fixes and extra fixes on the target systems. The following figure shows you a sample network.

Also, you can perform only a compare of fixes with the Compare and Update wizard. You can choose to review your list of missing and extra fixes without requesting to perform an update for the missing fixes.



### 1. Set up your model system

Set up a model system that has the appropriate fixes installed for the particular products, all fixes for all products, or fixes for particular releases. In some instances, your model system might be your central system. You should define a model system that works best in your environment. To set up your model system, follow these steps:

- a. Determine which fixes you want installed on the model system.
- b. Install those fixes.

### 2. Set up your source system

Verify that the save files for the fixes exist on the source system for the fixes that are installed on the model system. In some instances, your source system might be your model system. Get the save files to the source system by using the copy from media function.

### 3. Refresh your inventory

The comparison is done based on the information in the inventory, and now that you set up your model system and your source system, you may want to refresh the inventory at this time. If you do not refresh your inventory now, the Compare and Update wizard gives you the opportunity to refresh the inventory.

You can have the wizard perform a comparison, and optionally, send missing fixes, or send and install missing fixes after the compare has completed. As a general reminder, because a collected inventory is used to perform this task, it is important that you have an inventory that is current. You should collect your fixes inventory on all systems before you perform the compare and update task.

To **compare and update fixes on your target systems**, follow these steps:

1. In iSeries Navigator, expand **Management Central**.
2. Expand **Endpoint Systems** or **System Groups**.
3. Right-click a system or a group and select **Fixes**, and then **Compare and Update**.
4. Use the Compare and Update wizard to determine what fixes are missing from the target system when compared to your model system. When you have finished, Management Central can send or

send and install any missing fixes on the target system. When the missing fixes are installed, the target systems then have the same level of installed fixes as the model system.

*Compare and update considerations:*

Scenarios can exist where a fix on the model system is listed as superseded on the target system. In this case, the compare and update function tells you that the fix is missing on the target system because the superseded fix is not installed or the superseding fix is not installed. The fix continues to show as missing until the superseding fix is installed. A fix with a *Superseded* status does not mean that the later fix was installed. You can still load and apply the fix. A status of *Superseded* means that a later fix exists on the system. It is possible that the fix was not applied. The following scenarios illustrate this point.

*Scenario 1:*

PTF A on the target system is not installed but shows a status of Superseded. PTF A shows as missing on the target system. The PTF is sent and installed and shows a status of Temporarily applied on the target system.

Model system	Target system
PTF A	PTF B exists on target system as a save file only. PTF B supersedes PTF A.

*Scenario 2:*

PTF A on the target system is not installed but shows a status of Superseded. PTF A shows as missing on the target system and cannot be installed because PTF B was loaded. PTF B is installed on the target system. PTF A can be installed if it has a status of *Superseded* only if the superseding PTF, PTF B, was not loaded.

Model system	Target system
PTF A	PTF B was loaded on the target system. PTF B supersedes PTF A.

**Notes:**

1. Only those fixes that are identified as missing can be sent and installed. You cannot uninstall extra fixes. You can only display them.
2. Fix groups are not used in the compare and update function.
3. The compare and update function works only with fixes that are installed in some form on the model system for the products that are installed on the model system.

**Install fixes on systems with logical partitions:**

- | Even though the basic steps of installing a fix on a system with logical partitions are the same as on a system without logical partitions, there are some items that you need to be aware of before you begin to install your fixes.
- | For 8xx models, the basic steps of installing a fix or PTF are the same on a system with logical partitions as on a system without logical partitions.
- | However, you should take the following precautions:
  - When you load fixes to a primary partition, power down all secondary partitions before you restart the primary partition.

- When you use the GO PTF command on the primary partition, change the automatic IPL parameter from the default (\*YES) to (\*NO). You do not have to do this if you first power down the secondary partitions.

For information regarding IBM eServer 5xx models, see Customer service, support, and troubleshooting and “Install fixes on systems managed by Hardware Management Console.”

#### **Related concepts**

Restart a system with logical partitions

#### **Related tasks**

Power down

### **Install fixes on systems managed by Hardware Management Console:**

This topic describes how to install i5/OS fixes when your system is managed by the Hardware Management Console.

As the system administrator or system operator who manages the software level on your systems or partitions, you have two choices for performing this task for systems that are managed by the Hardware Management Console (HMC):

- You control the software level of the server firmware through the i5/OS service partition. This method requires a server IPL for the updates to take effect. A server IPL requires you to power down all the partitions at the same time.
- You allow the HMC to control the level of the server firmware. On systems that have an HMC attached, this is the default action. This method requires you to install fixes by using the HMC. With this method, the i5/OS service partition is disabled from applying updates to the server firmware. When the DSPPTF display for licensed product 5722999 is shown, message CPD35FA is displayed. This message indicates that updates are not allowed from the i5/OS service partition, and the server firmware that is currently active is at a different level than the server firmware portion of the Licensed Internal Code that is installed on the system. To allow updates through HMC only, see Customer service, support, and troubleshooting.

You can perform a server IPL from two different sources: the T side or the P side. The T side is considered the temporary side, which is the equivalent of the B IPL source on the iSeries server. The P side is considered the permanent side, which is the equivalent of the A IPL source on the iSeries server. These IPL sources do not have to be synchronized. Normally, the service partition is running on the B IPL source, and the code for the server firmware is running from the T side. The DSPPTF command shows the copy of the server firmware that was used on the previous server IPL in the IPL source header field (##SERV#T or ##SERV#P).

When fixes are applied to or removed from the server firmware portion of the Licensed Internal Code, a message is sent that indicates if any of the PTFs require a server IPL. You can use the DSPPTF command to determine which PTFs require a server IPL to activate the changes. The *Server IPL required* field is set to None; ##SERV#T or ##SERV#P indicates which IPL source to use when performing the server IPL. It is not sufficient to perform an IPL on only the service partition to activate the code; you must power down all the partitions at the same time.

### **Install fixes from an image catalog:**

This topic discusses how you can use an image catalog to install PTFs that you receive on physical media or that you received using FTP when you downloaded fixes from Fix Central.

**Note:** You cannot install PTFs directly from an image catalog with Management Central, but you can use the copy from media function to copy PTFs into save files from an image catalog associated with a virtual optical device. For instructions, see “Copy fixes from media” on page 34.

To install your fixes from an image catalog, do the following steps:

### 1. Create a virtual optical device

It is possible that you used an image catalog that is associated with a virtual optical device to perform a software upgrade. If you did, you do not need to perform this step. If you do not have a virtual optical device, you must create one.

- To create a device description, type the following on any command line:

```
CRTDEVOPT DEVD(OPTVRT01) RSRNAME(*VRT) ONLINE(*YES) TEXT(text-description)
```

- To determine whether a virtual optical device exists, type the following:

```
WRKDEVD DEVD(*OPT)
```

A virtual optical device is indicated by a device type of 632B.

To ensure that the device is active, press F14 (Work with configuration status). If the device is not active, type 1 to vary it on.

### 2. Create an image catalog

Create an image catalog for the set of PTFs that you want to install. The Create Image Catalog (CRTIMGCLG) command associates an image catalog with a target directory where the preloaded images are loaded.

```
CRTIMGCLG IMGCLG(ptfcatalog) DIR('/MYCATALOGDIRECTORY') CRTDIR(*YES) TEXT(text-description)
```

**Note:** A directory can be associated with only one image catalog.

### 3. Add an image catalog entry

You can add an image catalog entry for each physical media that you have. You can also add an image catalog entry for fixes that you received using FTP, for example, you downloaded fixes from Fix Central.

- Add an image catalog entry for each physical media that you have. You need to repeat this step for **each** volume of media. You should add the images in the same order as if you were going to install from them.

```
ADDIMGCLGE IMGCLG(ptfcatalog) FROMDEV(OPT01) TEXT(text-description)
```

- Add an image catalog entry for fixes that you downloaded from Fix Central into an IFS directory. You can add the directory into an image catalog in either of the following ways:

- Into the same directory that is associated with the image catalog directory.

```
ADDIMGCLGE IMGCLG(PTFCATALOG) FROMFILE(iptfxxx_x.bin)  
TOFILE(iptfxxx_x.bin)
```

- Into a different directory.

```
ADDIMGCLGE IMGCLG(PTFCATALOG)  
FROMFILE('/differentdirectory/iptfxxxx_x.bin')  
TOFILE(iptfxxx_x.bin)
```

### 4. Load the image catalog

This step associates the virtual optical device to the image catalog. Only one image catalog can be associated with a specific virtual optical device. Type the following command to load the image catalog:

```
LODIMGCLG IMGCLG(ptfcatalog) DEV(OPTVRT01) OPTION(*LOAD)
```

### 5. Verify that the images are in the correct order

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

The system puts the images in the correct order. By default, the volume with the lowest index is mounted; all the other volumes are loaded. Use the Work with Catalog Entries (WRKIMGCLGE) command to see the order of the images.

**Note:** If you are attempting to load individual PTFs with the Load PTF (LODPTF) command, only the PTFs on the volume set that is mounted can be loaded.

### 6. Install PTFs from virtual optical device

| To install PTFs from an image catalog associated with a virtual optical device, see “Install fixes from  
| media” on page 32 or “Install cumulative PTF packages” on page 29. For the device name, enter the  
| name of the virtual optical device that is associated with your image catalog. All the PTFs from the  
| images that are either mounted or loaded will be installed.

#### 7. Delete images from image catalog

Once you have successfully installed the fixes, you should remove the images from the catalog with the Remove Image Catalog Entries (RMVIMGCLGE) command. If you continue to add new images to the same image catalog without removing the old images, PTF install processing will attempt to install the fixes from all of the loaded images in the catalog.

### Step 4: Verify fix installation

After you have installed your fixes, you should verify that the install was successful.

You should develop the habit of verifying whether you were successful in installing your fixes. In general, if your fixes did not install, you need to determine whether the failure occurred during the load or apply phase of the install.

If the system did not IPL, then possibly the failure occurred during the load phase. Press Help on the failure message, and then press F10 (Display messages in the job log). Look for all escape messages that might identify what the problem is. You should fix these errors, and then try your request again.

If the system did IPL, but the PTFs did not apply, look at the history log.

1. Type **GO LICPGM** from any command line.
2. Type option 50 (Display log for messages).
3. Look for any messages that indicate any PTF activity during the previous IPL.  
Normal PTF processing occurs only during an unattended IPL (initial program load) that immediately follows a normal system end.  
If you did not specify Y for Perform Automatic IPL on the Install Options for PTFs display, verify that the Power Down System (PWRDWN SYS) command was run with RESTART(\*YES) and that the key lock position was at normal.  
If an abnormal IPL occurs, some Licensed Internal Code fixes might be installed, but no other operating system or licensed program PTFs are applied. You can look at the previous end of system status system value (QABNORMSW) to view whether the previous end of system was normal or abnormal.
4. Look for any messages that indicate that there was a failure during the IPL or that indicate that a server IPL is required. If you find any failure messages, do the following:
  - a. Go to the start-control-program-function (SCPF) job log (WRKJOB SCPF).
  - b. If you performed an IPL, choose the first job that’s not active and look at the spooled file for that job.
  - c. Find the error messages, and determine what caused the error
  - d. Fix the errors and re-IPL the system to apply the rest of the PTFs.

Additionally, you can do the following to verify that your fixes have been installed correctly:

1. On any command line, type **G0 LICPGM** and press Enter. The Work with Licensed Programs display appears.
2. Select Option 50 (Display log for messages). The Display Install History display appears.
3. Fill in the start date and start time on the Display Install History display and press Enter. The messages about fix installation are shown.

**If the fixes were installed successfully**, you see messages like the following:

PTF installation process started.  
Loading of PTFs completed successfully.  
Marking of PTFs for delayed application started.  
Marking of PTFs for delayed application completed successfully.  
Apply PTF started.  
Applying of PTFs for product 5722xxx completed successfully.  
Applying of PTFs for product 5722xxx completed successfully.  
Applying of PTFs for product 5722xxx completed successfully.  
. . .  
Applying of PTFs completed.

**If the PTFs were installed successfully but require a server IPL to activate the changes, you see messages like the following:**

PTF installation process started.  
PTFs installed successfully, but actions pending.  
Server IPL required.

- | You must perform a server IPL to activate the changes to the server firmware. Use the DSPPTF SELECT(\*ACTRQD) command to determine which PTFs require a server IPL and which IPL source (##SERV#T or ##SERV#P) to use when performing the server IPL. See “Install fixes on systems managed by Hardware Management Console” on page 38 for information on performing a server IPL.

**If the cumulative PTF package was not installed successfully, you see error messages like the following:**

PTF installation process started.  
Loading of PTFs failed.  
Marking of PTFs for delayed application started.  
Marking of PTFs for delayed application failed.  
Apply PTF started.  
. . .  
Applying of PTFs failed for product 5722xxx.  
. . .  
Applying PTFs failed.

#### **Related concepts**

“Single fixes” on page 5

- | Single PTFs (fixes) are applied to correct specific reported problems.
- Causes of abnormal IPLs

### **Advanced procedures for fix installation**

- | This topic introduces the advanced topics of loading and applying PTFs. You will also learn how to create your own fix package from CD-ROM and how to create a fix package to a virtual image.

In general, use option 8 from the Go PTF menu to install your fixes. Option 8 loads and applies fixes in one step. However, you can encounter some situations where you need to perform the separate steps of loading and then applying fixes. In addition to these two topics, you will learn how to customize a PTF package from CD-ROM and how to customize a PTF package to a virtual image.

#### **Advanced fix installation: Build a custom fix package:**

Find out how to create your own fix package that can be used in the same way as a fix package that is supplied by IBM service support.

You can encounter situations where you, as the service provider, do not want to distribute the same fixes to your service requesters. In those situations, you will want to build your own fix package from

CD-ROM that can be used the same way as a fix package supplied by IBM service support. This example combines a fix package with individual fixes into a custom fix package for distribution to other iSeries servers in your network.

**Note:** If you build a custom fix package and save it to virtual optical media, you cannot span virtual volumes. Your custom fix package must fit on one volume.

The order of a cumulative PTF package is:

- High-impact pervasive (HIPER) Licensed Internal Code fixes
- HIPER i5/OS fixes
- HIPER licensed program fixes
- A delimiter that divides the HIPER fixes from the non-HIPER fixes
- Non-HIPER Licensed Internal Code fixes
- Non-HIPER i5/OS fixes
- i5/OS Online information fixes, if any
- Non-HIPER licensed program fixes

*Customizing a PTF package from CD-ROM:*

For the following example, assume that you want a tape that contains all but one (SF00600) of the PTFs from the most recent PTF package received from IBM service support, including the HIPER PTFs. In addition, you want to include four individual PTFs received electronically from service support. These PTFs are MF00050, SF00480, SF00500, and SF00800.

Because the four individual PTFs were received from IBM service support, they already exist in save files in library QGPL. They exist in the library as object type \*file, as shown below:

- QMF00050: \*FILE
- QSF00480: \*FILE
- QSF00500: \*FILE
- QSF00800: \*FILE

1. Find out the path identifier for the fix file you want to copy from the cumulative PTF package:

**Note:** A path identifier is a 1 to 6-digit number that identifies each fix file on the CD-ROM. Each release of a licensed product on the CD-ROM has its own unique set of identifiers. Each set of path identifiers for the product begins with the number 1 indicating the first fix file for the product and release. This first fix file may or may not contain HIPER fixes for the product.

To get the path identifier for each fix file you want to copy from the cumulative PTF package for your product, use the Copy Program Temporary Fix (CPYPTF) command, and specify PATHID(\*SELECT). The Select PTF CD-ROM File display is shown.

**Select PTF CD-ROM File display**



Select PTF CD-ROM File					
					System: SYSNAMXX
Product . . . . . : 5722SS1					
Type option, press Enter.					
1=Select					
Opt	Release	Feature Type	National Language Version	Path Identifier	Hiper PTFs
	V5R4M0	*CODE		1	Yes
	V5R4M0	*CODE		2	No
	V5R4M0	*LNG	2924	2	No

- Use the CPYPTF command to bring the HIPER fixes from the cumulative PTF package into library QGPL. Two licensed programs are being used in this example (MF and SF PTFs). You can identify the HIPER fix files on the Select PTF CD-ROM File display by a Yes in the Hiper PTFs column.

```
CPYPTF LICPGM(5722999)
FROMDEV(OPT01)
TODEV(*SAVF)
FROMPATHID(1)
TOSAVF(QGPL/PCUMH999)
```

```
CPYPTF LICPGM(5722SS1)
FROMDEV(OPT01)
TODEV(*SAVF)
FROMPATHID(1)
TOSAVF(QGPL/PCUMHSS1)
```

- Copy the product delimiter into a save file.

```
CPYPTF LICPGM(5722111)
FROMDEV(OPT01)
TODEV(*SAVF)
SELECT(*ALL)
FROMPATHID(1)
TOSAVF(QGPL/PCUMH111)
```

- Copy the non-HIPER fixes from the cumulative package into a save file omitting the unwanted fixes.

```
CPYPTF LICPGM(5722999)
FROMDEV(OPT01)
TODEV(*SAVF)
FROMPATHID(2)
TOSAVF(QGPL/PCUMP999)
```

```
CPYPTF LICPGM(5722SS1)
FROMDEV(OPT01)
TODEV(*SAVF)
OMIT(SF00600)
FROMPATHID(2)
TOSAVF(QGPL/PCUMPSS1)
```

*Creating the custom package:*

Repeat the command for each licensed program with non-HIPER fixes. The OMIT parameter was used to identify the fix not included in the tailored package. The TOSAVF name must be 8 characters in length and must start with the letter P. You can choose the remaining seven characters. The library on the TOSAVF parameter must be QGPL.

Library QGPL now contains:

File Name	Object Type
QMF00050	*FILE
QSF00480	*FILE

```

QSF00500 *FILE
QSF00800 *FILE
PCUMH999 *FILE
PCUMHSS1 *FILE (plus more for HIPERs of licensed programs)
PCUMH111 *FILE
PCUMH999 *FILE
PCUMPSS1 *FILE (plus more for non-HIPERs of licensed programs)

```

1. Initialize the tape for the tailored cumulative package.

```

INZTAP DEV(TAP01)
NEWVOL(CUMPKG)

```

2. Copy the Licensed Internal Code HIPER fixes into one file and place it first on the tape.

```

CPYPTF LICPGM(5722999)
FROMDEV(*SERVICE)
TODEV(TAP01)
SELECT(CUMH999)
TOENDOPT(*LEAVE)

```

The TOENDOPT(\*LEAVE) parameter is used to maintain the tape position.

3. Copy the i5/OS HIPER fixes onto the CD-ROM.

```

CPYPTF LICPGM(5722SS1)
FROMDEV(*SERVICE)
TODEV(TAP01)
SELECT(CUMHSS1)
TOENDOPT(*LEAVE)

```

Repeat for each licensed program with HIPER fixes.

4. Copy the delimiter to the tape.

```

CPYPTF LICPGM(5722111)
FROMDEV(*SERVICE)
TODEV(TAP01)
SELECT(CUMH111)
TOENDOPT(*LEAVE)

```

5. Copy the non-HIPER Licensed Internal Code fixes into one file and place on the tape.

```

CPYPTF LICPGM(5722999)
FROMDEV(*SERVICE)
TODEV(TAP01)
SELECT(CUMP999 MF00050)
TOENDOPT(*LEAVE)

```

6. Copy the non-HIPER i5/OS fixes into one file and place on the tape.

```

CPYPTF LICPGM(5722SS1)
FROMDEV(*SERVICE)
TODEV(TAP01)
SELECT(CUMPSS1 SF00480 SF00500 SF00800)
TOENDOPT(*LEAVE)

```

Repeat for each licensed program with non-HIPER fixes.

The tape now contains the tailored fix package. It can be used in the same way that your service support fix packages are used.

Fixes can now be loaded on, applied to, or removed from a system.

#### **Advanced fix installation: Build virtual image fix packages:**

- | This topic discusses how you can create your own virtual image for fix packages that you want to install
- | at a later time.

#### **Notes:**

1. You cannot install PTFs from an image catalog with Management Central, but you can use the copy from media function to copy PTFs into save files from an image catalog associated with a virtual optical device. For instructions, see “Copy fixes from media” on page 34.
2. Your user profile must have \*ALLOBJ and \*SECADM authority to use the image catalog commands.
3. If you do not have a virtual optical device, you must create one. To create one, see “Install fixes from an image catalog” on page 38.
4. If you build a custom fix package and save it to virtual optical media, you cannot span virtual volumes. Your custom fix package must fit on one volume.

To create your own virtual image in an image catalog, do the following steps:

### 1. Create an image catalog

Create an image catalog for the set of PTFs that you want to install. The Create Image Catalog (CRTIMGCLG) command associates an image catalog with a target directory where the pre-loaded images are loaded.

```
CRTIMGCLG IMGCLG(ptfcatalog) DIR('/MYCATALOGDIRECTORY') CRTDIR(*YES) TEXT(text-description)
```

**Note:** A directory can be associated with only one image catalog.

### 2. Add an image catalog entry

Add an image catalog entry to create a new image file in the image catalog.

```
ADDIMGCLGE IMGCLG(ptfcatalog) FROMFILE(*NEW) TOFILE(NEWIMAGEFILE)
  IMGSIZ(xxxxx) TEXT(text-description)
```

The size of the image needs be large enough to contain the size of the fixes that you want to distribute.

### 3. Load the image catalog

This step associates the virtual optical device to the image catalog. Only one image catalog can be associated with a specific virtual optical device. Type the following command to load the image catalog:

```
LODIMGCLG IMGCLG(ptfcatalog) DEV(OPTVRT01) OPTION(*LOAD)
```

### 4. Initialize the virtual image

```
INZOPT NEWVOL(MYVOLUMEID) DEV(OPTVRT01) CHECK(*NO)
  TEXT(MYTEXTDESCRIPTION)
```

The system initializes the virtual image.

### 5. Copy PTFs to virtual media

Copy any PTFs and PTF groups to virtual optical device. You cannot span virtual optical volumes; all PTFs and PTF groups must fit on a single volume. If you exceed the capacity of the volume, either create a new volume or initialize the volume to a larger size.

Use the Copy PTF Groups (CPYPTFGRP) command to copy the PTF groups to the media. You can optionally specify CPYPTF(\*YES) on the command to copy the PTFs in the group.

```
CPYPTFGRP PTFGRP(xxxxxxx) FROMDEV(*SERVICE)
  TODEV(OPTVRT01) CPYPTF(*YES)
```

Use the Copy PTF (CPYPTF) command to copy PTFs to the media. Repeat the command for each product that you have.

```
CPYPTF LICPGM(xxxxxxx) FROMDEV(*SERVICE)
  TODEV(OPTVRT01) SELECT(xxxxxxx)
```

#### Related tasks

Create actual media from a virtual image

Transport virtual images

#### Advanced fix installation: Load fixes:

Find out how to load one, some, or all of your fixes with the Load Program Temporary Fix (LODPTF) command.

Typically, you should use option 8 from the GO PTF menu to install your fixes. However, you can encounter some situations where you need to perform the separate steps of loading and then applying the fixes.

The fix packages on CD-ROM or in a save file can contain many fixes. You can load one, some, or all of them using the Load Program Temporary Fix (LODPTF) command. As fixes are loaded, the system verifies that the release of the product is correct. Fix status is **not** applied after the fix has been loaded on the system. Use the Apply Program Temporary Fix (APYPTF) command to apply the fix. For some of the applied fixes, the status is Temporarily applied - ACN. There are also some temporarily applied fixes that show a status of Temporarily applied - PND. For these fixes, you need additional actions to make them active.

*Loading individual fixes from a cumulative PTF package:*

To load one fix from a cumulative package, do the following steps:

1. Type LODPTF and press F4 (Prompt).
2. Specify the parameter values according to the fix you are loading.
3. Specify the fix identifier you want to load in the fix numbers to select (SELECT) parameter and press Enter.
4. Repeat LODPTF command for each fix you want loaded from the cumulative package.

For fixes on a CD-ROM, the system will automatically find the fix file in the cumulative package that contains the selected individual fixes when you specify PATHID(\*FIRST). All fixes to be loaded must exist in the same path identifier. Otherwise, you need to load the fixes separately.

For fixes on an image catalog, only the images that are part of the volume set for the image that is mounted are searched.

*Loading fixes that supersede other fixes:*

If the fix being loaded replaces (supersedes) existing fixes (identified in the fix cover letter) the following considerations apply:

- If the fix to be replaced is not applied to the system, the new fix can be loaded successfully. A record is kept indicating that the replaced fix has been superseded.
- If the fix to be replaced is permanently applied, it is considered to be a part of the operating system or licensed program to which it was applied. The new fix can be loaded successfully.
- If the fix to be replaced is temporarily applied, the load operation will automatically permanently apply any replaced (superseded) fixes. If you do not want the fix function to permanently apply any replaced (superseded) temporarily applied fixes automatically, specify \*NOAPY for the Superseded PTFs (SPRPTF) parameter on the LODPTF command. The fixes to be replaced must either be permanently applied or permanently removed before fixes that are replacing them can be loaded.

| **Note:** When you order a fix, IBM service does not search through the fixes to determine which one is the  
| latest level. For example, if you order a fix that is superseded by another fix, IBM service will send  
| you only the fix that you ordered instead of the superseding fix. You need to use the summary list  
| to identify the fix you need to order. Scan the summary list for fixes that replace the fix in question  
| and then order the fix.

**Advanced fix installation: Apply fixes:**

Find out how to apply one, some, or all of your fixes with the Apply Program Temporary Fix (APYPTF) command.

Typically, use option 8 from the GO PTF menu to install your fixes. However, you can encounter some situations where you need to perform the separate steps of loading the fixes and then applying the fixes.

Some fixes cannot be applied immediately because the operating system or licensed programs they affect are active. These fixes are called delayed fixes and can be applied only at the next system initial program load (IPL). Immediate fixes can be applied without doing an IPL if the licensed program they affect is not in use, or may be applied like delayed fixes when you do the next IPL.

Fixes generally should be installed when received. Installing fixes allows you to test them in your operational environment. You should ensure that the new fixes operate properly on your system before permanently installing them. As long as the fixes are installed temporarily, they can be removed. Once they have been installed permanently, they cannot be removed.

When you are sure that the Licensed Internal Code fixes work properly, it is recommended that you install them permanently to reduce the time required to install the next cumulative PTF package, and to make available the storage for future fixes. If this storage is not made available, you will need to permanently install some of your Licensed Internal Code fixes before you can temporarily install any additional fixes. Temporarily installed Licensed Internal Code fixes are only in effect when you use the B storage area to perform an IPL.

**Notes:**

1. You cannot apply or remove fixes with mandatory special instructions when \*ALL is specified on the PTF numbers to select (SELECT) parameter of Apply Program Temporary Fix (APYPTF) or Remove Program Temporary Fix (RMVPTF) commands. These PTFs are only applied or removed when they are specified by a number on the SELECT parameter. This protects against applying or removing fixes without reading the mandatory special instructions.
2. The term fix, in this context, refers to Licensed Internal Code fixes and licensed program fixes, including i5/OS program fixes.
3. When installing fixes, other fixes can be specified as requisites for the fix. These different types include *prerequisite fixes* and *corequisite fixes*. Each type has a different relationship with the fix that you are trying to apply.

Fixes can be applied (made active) on either a temporary or permanent basis. If the fix is applied temporarily (also known as installed), a copy of the object being changed is saved. If the fix is applied permanently (also known as permanently installed), the old object is removed. Permanently applied fixes cannot be removed. You can also apply fixes during an attended IPL or during an unattended IPL. The following tasks provide you with instructions on how you can apply fixes:

*Advanced fix installation: Cancel the application of fixes:*

Find out how to prevent a fix that was selected to be installed at the next IPL from being installed.

To prevent a fix that is selected to be installed after you have already selected option 8 (Install program temporary fix package) on the GO PTF menu, but before the IPL has been done, enter the following command:

```
APYPTF LICPGM(XXXXXXX) SELECT(YYYYYYY) DELAYED(*YES)
      APY(*TEMP) IPLAPY(*NO)
```

where XXXXXXXX is the licensed program and YYYYYYYY is the number of the fix you want to omit.

This action resets the IPL apply indicator to IPL Action NONE.

*Advanced fix installation: Apply fixes during an unattended IPL:*

Instructions are given for temporarily or permanently installing both delayed and immediate fixes during an unattended IPL.

You can temporarily or permanently install both delayed and immediate fixes. To install delayed fixes temporarily, follow these steps:

1. On any command line, type:  

```
APYPTF LICPGM(*ALL) SELECT(*ALL) APY(*TEMP)
      DELAYED(*YES) IPLAPY(*YES)
```
2. Press Enter.

To permanently install all fixes that are temporarily installed (status of *Temporarily applied*) during the next unattended IPL, or to permanently install all immediate fixes that have a status of *Not applied* during the next IPL, follow these steps:

1. On any command line, type:  

```
APYPTF LICPGM(*ALL) SELECT(*ALL) APY(*PERM)
      DELAYED(*YES) IPLAPY(*YES)
```
2. Press Enter.

To perform an IPL on the system, follow these steps:

1. On any command line, type:  

```
PWRDWN SYS *IMMED RESTART(*YES) IPLSRC(B)
```
2. Press Enter.

**Note:** If your system has logical partitioning, the Power pushbutton, DST option 7, or the Power Down System (PWRDWN SYS) command can affect multiple partitions.

#### **Related concepts**

Manage logical partitions

*Advanced fix installation: Apply fixes during attended IPL:*

Find out how to temporarily or permanently install both delayed and immediate fixes during an attended IPL.

You can temporarily or permanently install both delayed and immediate fixes that have a status of *Not applied* during an attended IPL.

To temporarily install a delayed fix, you only need to do one IPL. To permanently install a delayed fix after it has been applied temporarily and tested, you need to do another IPL.

**Before you start:** Send a message to users notifying them to sign off the system.

To temporarily or permanently install a fix during an attended IPL:

1. Switch the system unit to the Manual mode. If you are temporarily installing delayed Licensed Internal Code fixes, select storage area **A**. Immediate Licensed Internal Code fixes can be installed when you do an IPL to storage area B. If you are permanently installing Licensed Internal Code fixes, select storage area **B**.
2. Type:  

```
PWRDWN SYS *IMMED RESTART(*YES) IPLSRC(x)
```

where x is your storage area, on any command line and press Enter.

3. Select option 1 (Perform an IPL) on the IPL or Install the System display.

4. Type your user ID and password on the Sign On display.
5. On the Select Products to Work with PTFs display, select the licensed program for which you want to install the fix.
  - If fixes are not applied or are temporarily applied, the Work with PTFs display is shown. This display is used to install and remove fixes and shows the current status of each fix that you can work with.
  - If you want to keep the same status for any of the fixes displayed, leave the Opt column empty.
  - Fixes that are not installed can be either temporarily installed using option 1 or permanently removed using option 4.
  - Fixes that are temporarily installed can be either permanently installed using option 2 or temporarily removed using option 3.

**Note:** For an explanation of *permanently removed* and *temporarily removed* PTFs, see “Remove software fixes” on page 59.

6. After typing the option number you want for each of the fixes displayed, press Enter.
7. Repeat step 5 and step 6 for each licensed program for which you want to apply fixes.
8. Press F3 (Exit) to continue with system operations.

*Advanced fix installation: Apply fixes without an IPL:*

To temporarily or permanently install immediate fixes without doing an IPL, follow these steps.

1. Make sure the licensed programs to which the fixes are being applied are not in use.

**Note:** Be sure to follow any special instructions, including activation instructions, in the cover letter to ensure that the system is in the correct state.

2. Enter the Apply Program Temporary Fix (APYPTF) command and press F4 (Prompt). Press F9 (All parameters) to display all of the fields on the Apply Program Temporary Fix (APYPTF) display.
3. Specify the number that corresponds to the licensed program you are applying fixes for the Product (LICPGM) parameter.
4. Specify the release level for the Release (RLS) parameter.

**Note:** The release parameter is only required if more than one release of the product is installed.

5. Select the fixes you want applied by doing one of the following:
  - Specify the identifiers of the fix you want to apply in the PTF numbers to select (SELECT) parameter. To apply all fixes, specify \*ALL in the PTF numbers to select (SELECT) parameter.
  - Specify \*ALL for the fix numbers to select (SELECT) parameter, and the numbers of specific fixes you do not want to apply for the fix numbers to omit (OMIT) parameter.

**Note:** Specify APYREQ(\*YES) to ensure all requisites within the same product are also applied if individual fix identifiers are specified in the SELECT parameter.

6. To temporarily install the fixes, specify \*TEMP for the Extent of change (APY) parameter. To permanently install the fixes, specify \*PERM.

**Note:** Fixes that are temporarily installed can be removed; fixes that are permanently installed cannot be removed (see Removing fixes).

7. Specify \*NO for the Delayed PTFs (DELAYED) parameter.

**Note:** To apply all immediate fixes right now and all delayed fixes on the next IPL, specify \*ALL for the Product (LICPGM) parameter, \*ALL for the Select (SELECT) parameter, and \*IMMDLY for the Apply Type (APPLY) parameter.

8. Press Enter. The system applies the fixes to the specific licensed program.

9. Repeat steps 2 on page 49 through 8 on page 49 until the fixes are applied for all the selected licensed programs.

*Advanced fix installation: Apply fixes at the next unattended IPL:*

- 1 Instructions are given for applying Licensed Internal Code fixes at the next unattended IPL.

To apply Licensed Internal Code that is currently operating on the A storage area, the Licensed Internal Code fixes can be applied immediately.

1. Make sure the system is in the Normal mode.
2. If you are not running on the correct storage area, type the following on any command line and press Enter:

```
PWRDWSYS *IMMED RESTART(*YES)
IPLSRC(B)
```

3. Type the following commands on any command line and press Enter after each one:

```
APYPTF LICPGM(5722999) APY(*TEMP) DELAYED(*YES)
PWRDWSYS *IMMED RESTART(*YES) IPLSRC(B)
```

- 1 **Note:** While applying Licensed Internal Code fixes, it may be necessary for the system to reorganize a portion of the Licensed Internal Code storage. This reorganization can take up to 1 hour. While this reorganization is taking place, reference codes C600 434B and C600 435B are displayed.

*Advanced fix installation: Apply Licensed Internal Code fixes without an IPL:*

Determine how to apply Licensed Internal Code fixes without an IPL.

You may be operating from either storage area to temporarily install an immediate Licensed Internal Code fix without doing an IPL. You must be operating from the B storage area to permanently install a temporarily installed Licensed Internal Code fix without doing an IPL.

- 1 To immediately apply a delayed Licensed Internal Code fix without doing an IPL, you must be operating from the A storage area. If you are on the B storage area, see “Advanced fix installation: Apply fixes at the next unattended IPL.”

To determine the storage area you are currently operating from:

1. On any command line, type:  
DSPPTF 5722999
2. Press Enter.

On the Display PTF Status display, the storage area is identified in the IPL source field. ##MACH#A is the A storage area and ##MACH#B is the B storage area.

If you are not running on the correct storage area, do the following steps:

1. On any command line, type:  
PWRDWSYS \*IMMED RESTART(\*YES) IPLSRC(X)  
where IPLSRC(X) is A if you want to apply them temporarily or B if you want to apply them permanently.
2. Press Enter.

To apply Licensed Internal Code fixes immediately, do the following steps:

1. On any command line, type:  
APYPTF 5722999 APY(xxxxx) DELAY(\*NO)



where where xxxxx is \*TEMP or \*PERM.

2. Press Enter.

## Display fixes information on your server

- Use this topic to find out more about what each fix status and inventory means in your environment.
- You can find information about the purpose and contents of fixes, general information about fixes, and details about the status of fixes on your system. For further information, see “Where to find information about fixes” on page 16.

## Display fix status with iSeries Navigator

Use iSeries Navigator to view the status descriptions for your fixes.

The fix management function available through iSeries Navigator allows you to manage your fixes with a graphical user interface. To view the status of the fixes for products that are installed and supported on your system, do the following:

1. In iSeries Navigator, expand **Management Central**.
2. Expand **Endpoint Systems**.
3. Expand the system for the fixes that you want to display status for.
4. Expand **Configuration and Service**.
5. Expand **Fixes Inventory**.
6. Expand **All Fixes** to view the status shown in the right pane. You can also right-click and select **Properties** to see additional information.

**Note:** Because a collected inventory is used for Management Central tasks, it is important that you have an inventory that is current; therefore, you should collect the fixes inventory on a regular basis.

## Display PTF information with the character-based interface

Use the character-based interface to view the status descriptions for your fixes.

You can manage your PTFs with the options available from the GO PTF menu. Option 5 (Display Program Temporary Fix) shows you the status of your PTFs. In addition to the status of a PTF, you can also find out general information about a PTF.

### Displaying PTF status information:

To determine the status of the PTFs for products that are installed and supported on your system, do the following:

1. Type DSPPTF and press F4 (Prompt).
2. Specify the licensed program number and fix identifier for the product (LICPGM) parameter and for the fix numbers to select (SELECT) parameter. If you want to see the status for all the products on the system, specify \*ALL for both parameters and press Enter until all the licensed programs are displayed.
3. The Display Program Temporary Fix display shows the action that will be taken for a fix at the next unattended IPL (initial program load).

### Displaying PTF details:

In addition to the status of a PTF, you can find out general information about a fix by doing the following:

1. On any command line, type DSPPTF. The display PTF Status display appears.
2. Select the specific fix that you want to display and then select Option 5 (Display PTF details). The Display PTF menu appears.

3. Select Option 1 (General information). The General information display appears.

The following table describes each field on the General information display:

Field	Description
On order	Specifies whether the fix is on order. Yes indicates that the fix is on order, but may or may not be on the system. No indicates that the fix is not ordered.
PTF save file	Specifies whether a save file exists for the fix.
PTF status	Specifies the current status of the fix. The fix status field on the Display information display may differ from the Status field on the Display PTF status display for several reasons: <ul style="list-style-type: none"> <li>• If there has been a change in status since the Display PTF Status display is shown, the General information display shows the updated status.</li> <li>• The Status field on the Display PTF Status display is a combination of the fix status field, and the Action pending and Action required fields on the General information display.</li> <li>• If the system encountered an error while building the fix information file, the fix status is updated when the General information display is shown.</li> </ul>
Latest superseding PTF	Specifies the most recent superseding PTF to the PTF currently shown.
Status date/time	Specifies the date and time that the PTF status was last changed. The PTF obtained the current status at the date and time listed.
Type	Specifies whether the fix is immediate or delayed
Unattended IPL action	Specifies the action that will occur on the next unattended IPL (initial program load).
Optional part	Specifies the option that this fix is for.
PTF library	Specifies the library this fix is installed into.
Cover letter	Specifies whether there is a cover letter for this fix.
Mandatory instructions	Specifies whether there are instructions that need to be performed before this fix is applied.
Test Fix	Specifies that you cannot permanently apply a test fix on the system.
Action pending	Specifies whether there is an action that needs to be performed. If YES is specified for this field, an action needs to be taken to make the fix active or inactive. If NO is specified, it means the fix is active.
Action required	Specifies whether an action is required to make this fix active after it has been applied.
Target i5/OS release	Specifies the release of the operating system this fix can be copied to or loaded on.
Minimum-maximum level	Specifies the lowest and highest level of the product that this fix can be installed on. Some fixes are able to span multiple levels of a product.
Server IPL required	Specifies whether or not the PTF requires a server IPL to activate the changes for the PTF.

Field	Description
PTF creation date/time	Specifies the date and time that the PTF was created.

## Display properties of a fix or fix group

Use iSeries Navigator to display the information about your fixes and fix groups.

Information similar to what you see when you use the command interface is shown in iSeries Navigator. For example, several properties pages exist to provide you with information about fixes similar to what is shown when you use the Display PTF (DSPPTF) command. You can view the fix ID, the associated product and release, the status, and whether or not a cover letter or save file exists on the system. In addition, you are shown any requisite fixes or dependent fixes. Finally, you can see the objects that are contained in the fix and the name of the library in which the objects reside after you install the fix.

The same is true when you view the properties for a fix group. For example, several properties pages exist to provide you with information about fix groups similar to what is shown when you use the Work with PTF Groups (WRKPTFGRP) command. You see the name of the fix group, its description, and status. You are also shown a list of all the related fix groups.

### Display properties of a fix:

To display the properties of a fix, do the following:

1. In iSeries Navigator, expand **Management Central**.
2. Expand **Endpoint Systems or System Groups**.
3. Expand the endpoint system with the fixes inventory you want to view.
4. Expand **Configuration and Service**.
5. Expand **Fixes Inventory**.
6. Click **All Fixes**.
7. Right-click the fix for which you want to view the properties and select **Properties**.

### Display properties of a fix group:

1. In iSeries Navigator, expand **Management Central**.
2. Expand **Endpoint Systems or System Groups**.
3. Expand the endpoint system with the fixes inventory you want to view.
4. Expand **Configuration and Service**.
5. Expand **Fixes Inventory**.
6. Click **Fix Groups**.
7. Right-click the fix group for which you want to view the properties and select **Properties**.

## Display an inventory of fixes on your server with Management Central

Use iSeries Navigator to collect and display an inventory of fixes on your server.

You can manage your fixes inventory with the Management Central graphical wizards. For example, use the Compare and Update wizard to automatically compare a group of systems to a model system, find the missing fixes and extra fixes, and send the missing fixes to each system and install them. You can launch the Compare and Update wizard from an endpoint system, a system group, or from a system in your list of connections.

When you select fixes inventory from the Collect Inventory dialog, software inventory is automatically selected as well. You cannot select fixes inventory without including software inventory. Inventory for fix groups is also collected when you specify fixes. You can also specify whether you want to collect fixes only when changes have occurred to the fixes data or to collect fixes even when no changes have

occurred since the last collection. This setting does not affect the collection of fix group data, which is always collected. You specify this setting from the *Connection tab* of the Management Central Properties page.

The fixes inventory list shows all products installed and the fixes contained within them. For each fix, you can view the status of the fix and other information such as the ID, associated product, release, or type.

From the fixes inventory list, you can do any of the following:

- Run the wizards to install fixes, send and install fixes, permanently install fixes, or uninstall fixes
- Clean up save files and cover letters
- Perform other advanced functions, such as canceling fix actions
- Schedule when to perform these actions
- Copy fixes from media

Because a collected inventory is used for Management Central tasks, it is important that you have an inventory that is current; therefore, collect the fixes inventory on a regular basis. You also need to be aware that any tasks made from the fixes inventory list are not automatically reflected in the inventory.

#### **Related concepts**

Management Central

“Manage software inventory” on page 66

It is important that you keep your inventory current on your central system to keep an up-to-date view of the fixes on the systems that you are managing.

## **Display level of fixes**

Find out the latest level of your cumulative PTF package or of the Licensed Internal Code fixes.

You may have a need to know what the latest levels are of cumulative PTF packages, Licensed Internal Code PTFs, or HIPER PTFs. The cumulative PTF package level of your system refers to the latest cumulative PTF package installed on your servers.

### **Display the cumulative PTF package level:**

To display the cumulative PTF package level of your server, do the following steps from iSeries Navigator:

1. Expand **Management Central**.
2. Expand **Endpoint Systems**.
3. Right-click the endpoint system, select **Properties**, and then click the **Details** tab.

### **Determine your current cumulative PTF package level:**

To determine your current cumulative PTF package level, do one of the following:

#### **Display cumulative PTF group**

Use the Work with PTF Groups (WRKPTFGRP) command or view the fix group inventory for the system with iSeries Navigator. Find the PTF group that is named SF99540. The status of the PTF group indicates if all the PTFs in the cumulative PTF package are installed on your system. The level of the PTF group identifies the level of the cumulative PTF package. For example, if the level is 4178, your cumulative PTF package ID is C4178540 (540 is added to the end of the package ID to indicate version 5 release 4 modification level 0). The level of the cumulative package ID indicates the release date of the package using the Julian calendar. Specify WRKPTFGRP SF99540, and type option 8 (Display special handling PTFs). The date shown may

be later than the release date of the package in the Level field if the special handling PTF section has changed. This date may be referred to from the PSP information when installing your cumulative PTF package.

### Display cumulative marker PTFs

To display cumulative marker PTFs, do one of the following:

- For the cumulative PTF package level, type the following from the character-based interface:  
DSPPTF LICPGM(5722SS1)
- For the Licensed Internal Code PTFs level, type the following:  
DSPPTF 5722999

The PTF ID column on the Display PTF Status display lists the identifiers for all of the cumulative PTF packages installed on your system. Cumulative PTF package identifiers start with the letter T.

| If you are using version 5 release 4 modification 0 and you have PTF TC04178 installed on your system,  
| your cumulative fix package level is C4178540 (540 is added to the end of the package ID to indicate  
| version 5 release 4 modification Level 0). The last four digits of the cumulative package ID indicate the  
| release date of the package, using the Julian calendar. The latest level of the cumulative PTF package is  
| the one where the last four digits are the highest.

**Note:** Fix IDs that start with the letters TC indicate that the entire cumulative PTF package has been applied. Fix IDs that start with the letters TA indicate that the HIPER fixes and HIPER Licensed Internal Code fixes have been applied. Fix IDs that start with the letters TL indicate that the HIPER Licensed Internal Code fixes have been applied.

| Usually the numbers for the corresponding TC, TA, and TL fix IDs are all the same for each  
| release. For V5R3, however, the TL numbers for Licensed Internal Code might differ from the TC  
| and TA numbers. For example, V5R3M0 has the marker TC04178. The Licensed Internal Code  
| HIPER marker, however, is TL04178 for V5R3M0 and TL54178 for V5R3M5.

### Print or display the summary of fixes in a cumulative PTF package on CD-ROM:

To print or display the summary of fixes contained in a cumulative PTF package on CD-ROM, do the following:

1. Load the cumulative PTF package CD-ROM in the CD-ROM drive.
2. On any command line, type:

```
LODPTF LICPGM(5722999) DEV(OPTYY) SELECT(*ALL)  
PATHID(*FIRST) COVER(*ONLY)
```

where YY is the unit ID for the CD-ROM drive in which you loaded the PTF CD-ROM. For information about printing the cumulative fix package summary, see "Display and print fix cover letters" on page 57. A copy of the PTF summary is put into file QAPZCOVER in Library QGPL.

### Display server firmware PTFs:

When you use the Display PTF (DSPPTF) command, you see information associated with the service partition:

- When the partition is the service partition, the IPL source field on the display shows the side on which the last server IPL was performed for the server firmware code (##SERV#T or ##SERV#P).
- | • When PTFs are applied for the server firmware portion of the Licensed Internal Code but are not  
| active, you see statuses that indicate a server IPL is required to complete the operation. To view the  
| status descriptions for your fixes, see "Fix status descriptions using the command interface" on page  
| 14.
- When the server firmware that is currently active is at a later level than the server firmware portion of the Licensed Internal Code that is installed on the system, message CPD35F9 is shown.

- When the installed level of the server firmware portion of the Licensed Internal Code has changed, message CPD35F8 indicates that a server IPL is required.
- When the server firmware that is currently active is at a different level than the server firmware portion of the Licensed Internal Code that is installed on the system but changes are not allowed from the service partition, message CPD35FA is shown.
- Option 5 (Display PTF details) contains a field that indicates whether or not the PTF requires a server IPL (Server IPL required). The value shown indicates from which side the IPL needs to be performed to activate the changes. If no server IPL is pending, the value is None.

When you specify `DSPPTF SELECT(*ACTRQD)`, you see all the PTFs that have required actions pending, including the PTFs that require you to perform a server IPL.

## Work with fix cover letters

- Cover letters provide information about the fixes that they accompany.
- The primary function of a cover letter is to convey any special instructions that can exist when you install your fixes. Therefore, it is important that you review the cover letters prior to installing your fixes. For an example of a cover letter, see “Sample fix cover letter and description of fields” on page 8. You can delete old cover letters to save space on your system as part of the cleanup fixes task. For more information, refer to “Clean up fixes” on page 58.

### Order fix cover letters

How, when, and why to order fix cover letters.

The Send PTF Order (`SNDPTFORD`) command allows you to prepare an order for:

- Individual fixes
- Cumulative PTF packages
- Group fix
- Summary information for available fixes
- Preventive Service Planning (PSP) information

Additionally, the `SNDPTFORD` command allows you to specify whether you want to order complete fixes or cover letters only (`*CVRLTR`) for fix parts. Use the cover letters only option by specifying `PTFPART(*CVRLTR)` to preview new fixes and to determine whether or not you want to order that fix. To order a fix cover letter without ordering the fix, complete these steps from any command line:

1. Type: `SNDPTFORD nnnnnn PTFPART(*CVRLTR)`
2. Press Enter.
3. Verify contact information. This information is used by your service representative to contact you or send you service information. You can specify the language in which you want to receive your cover letter. If the language that you specify is not available, the cover letter is sent in English.

### Copy fix cover letters from media

This topic describes how, when, and why to copy fix cover letters.

Fixes that are packaged on CD-ROM are sent by mail. A shipping information letter is included, and each fix on the media may also have a cover letter. To view the cover letters, you must use the Copy Program Temporary Fix Cover Letter (`CPYPTFCVR`) command to copy the cover letters from optical media into file `QAPZCOVER` in library `QGPL`. Each cover letter contains information such as problem description, correction, and special instructions. This action allows you to display and print the cover letters.

## Copying all cover letters

To copy all cover letters from media onto the system for fixes that are not already applied to your system, enter the following command:

```
CPYPTFCVR DEV(YYYYY) LICPGM(*ALL) SELECT(*NOTAPY)
```

YYYYY is the media device name (typically named OPT01 for optical devices).

## Copying a cover letter for a specific fix

To copy a cover letter for a specific fix from media onto the system, enter the following command:

```
CPYPTFCVR DEV(YYYYY) LICPGM(XXXXXXX) SELECT(ZZZZZZ)
```

XXXXXXX is the licensed program number, YYYYY is the device name (typically named OPT01 for optical devices), and ZZZZZZ is the fix ID for the cover letter you want to copy.

## Display and print fix cover letters

How, when, and why to display and print fix cover letters.

Cover letters provide information about the fixes that they accompany. You can display them with iSeries Navigator or display and print them through the Display PTF Cover Letter (DSPPTFCVR) command.

**Note:** If you receive your fixes on media, you must copy the fix cover letters from media before you can display the cover letters. For instructions, see “Copy fix cover letters from media” on page 56.

### Related reference

Display PTF Cover Letter (DSPPTFCVR) command

### Displaying cover letters from iSeries Navigator:

To display a cover letter from iSeries Navigator, follow these steps:

1. In iSeries Navigator, expand **Management Central**.
2. Expand **Endpoint Systems**.
3. Expand the system for the fixes that you want to display cover letters for.
4. Expand **Configuration and Service**.
5. Expand **Fixes Inventory**.
6. Expand **All Fixes**.
7. Select the fixes and right-click. Select **Cover Letter**.

### Displaying and printing cover letters from the character-based interface:

To display or print cover letters for all fixes that are currently not applied on your system, enter **one** of the following commands:

- DSPPTFCVR LICPGM(\*ALL) SELECT(\*NOTAPY)
- DSPPTFCVR LICPGM(\*ALL) SELECT(\*NOTAPY) OUTPUT(\*PRINT)

**Note:** You can also choose to view only cover letters that have certain attributes such as specifying CVRATR(\*SPCINST) to view all cover letters that have special instructions.

To display or print a cover letter for a specific fix, enter **one** of the following commands:

- DSPPTFCVR LICPGM(XXXXXXX) SELECT(ZZZZZZ)
- DSPPTFCVR LICPGM(XXXXXXX) SELECT(ZZZZZZ) OUTPUT(\*PRINT)

XXXXXXX is the licensed program number and ZZZZZZ is the fix ID for the cover letter you want.

## Clean up fixes

If you are running out of storage space on your system, it might be time to delete your save files and cover letters.

- | Over time, save files and cover letters for fixes tend to accumulate. After you have permanently installed
- | a fix and performed a SAVSYS operation, you might want to delete the fix save file and cover letter if
- | you do not need to distribute it to another system and if you are satisfied that the fix is not defective.
- | Once a fix has been permanently installed and the save file is deleted, all information about the fix except
- | the status information is also deleted. By deleting the save file, you can make more room on your system
- | for other files.

### Delete save files with iSeries Navigator

iSeries Navigator provides you with a way to delete save files and cover letters for fixes that are no longer needed. To clean up your save files and cover letters, follow these steps:

1. In iSeries Navigator, expand **Management Central**.
2. Select **Endpoint Systems** or **System Groups** from the tree hierarchy. This action allows you to select one or more systems from the right pane.
3. Right-click the system or systems on which you want to perform the action, select **Fixes**, and then select **Clean Up**.
4. Make your selection with regard to cleaning up all save files and cover letters. You can choose to perform the task against all fixes (for all products), all fixes for a particular product, or for selected fixes.
5. Click **OK** or **Schedule** to submit the task.

iSeries Navigator provides more than one path to clean up fixes. See the detailed help that is available from the iSeries Navigator window for a complete list of all those paths. Just click **Help** from the menu bar and select **Help Topics**. Select **What can I do with . . . ?** to find out what you can do and where you need to be in the iSeries Navigator window to make it happen.

### Delete save files with the DLTPTF command

From the character-based interface, use the Delete Program Temporary Fix (DLTPTF) command to delete PTF save files and cover letters. Do not use the Delete File (DLTF) command to delete PTF save files. If you use the DLTF command, the PTF function will not detect that you deleted the save file.

**Note:** Fix save files and cover letters for a previous release are removed during automatic cleanup if system logs are specified.

### Clean up PTF groups

- | If you follow a PTF maintenance strategy, you normally will have several PTF groups stored on your
- | system. The system keeps only the latest level of a PTF group on the system and never automatically
- | deletes any PTF group. Therefore, when you upgrade to a new release of the IBM i5/OS operating
- | system, you need to manually delete PTF groups from previous releases that you no longer need.

- | To delete a PTF group, follow these steps:

- | 1. Use the Work with PTF Groups (WRKPTFGRP) command.
- | 2. Select option 4 next to each PTF group that you want to delete.

- | **Note:** Deleting a PTF group deletes only the PTF group information from the system. It does not delete
- | or remove any PTFs from the system or any related PTF groups that are defined in the PTF group.



## Remove software fixes

Learn about when you can remove fixes from your system and why you want to remove them.

You can remove fixes that you installed temporarily. Delayed fixes that you installed temporarily can be removed temporarily when you do a restart or IPL (initial program load) and then removed permanently without doing an IPL. Immediate fixes that you installed temporarily can be removed either temporarily or permanently without doing an IPL. You can also remove immediate fixes that have been loaded but not applied. Fixes permanently installed cannot be removed.

**Note:** In iSeries Navigator, the concept of removing a fix is the same as uninstalling a fix. For more information about uninstalling fixes, refer to the detailed task help that is available from the iSeries Navigator window. Just click **Help** from the menu bar and select **Help Topics**. Select **What can I do with . . .?** to find out what you can do and where you need to be in the iSeries Navigator window to make it happen.

When fixes are removed temporarily, the original objects that were replaced by the fix are restored to the program library. The system again verifies that the fix being removed is not required for any other currently applied fix. If the fix being removed is found to be required, the other fix (that it is required for) must be removed first or at the same time.

**Note:** Licensed Internal Code fixes can only be removed permanently.

## Remove licensed program fixes

Find out how to remove one or more licensed program fixes.

To remove one or more licensed program fixes, follow these steps:

1. Enter the Remove Program Temporary Fix (RMVPTF) command and press F4 (Prompt).
  2. On the Remove Program Temporary Fix (RMVPTF) display, specify the licensed program for the Product (LICPGM) parameter.
  3. Select the fixes you want removed by doing one of the following:
    - Specify the numbers of the fixes you want to remove for the PTF numbers to select (SELECT) parameter or \*ALL to remove all of them.
- Note:** Specify RMVDEP(\*YES) when specific fix numbers are entered on the SELECT parameter to ensure that dependents in the same product are also removed.
- Specify \*ALL for the PTF numbers to select (SELECT) field and the numbers of specific fixes you do not want to remove for the PTF numbers to omit (OMIT) parameter.
4. Specify \*TEMP for the Extent of change (APY) parameter to remove the fixes temporarily or \*PERM to remove the fixes permanently.
  5. If you are removing immediate fixes, specify \*NO for the Delayed PTFs (DELAYED) parameter.
  6. If you are identifying delayed or immediate fixes that are to be automatically removed during the next unattended IPL, specify \*YES for the Delayed PTFs (DELAYED) parameter and \*YES for the Remove on unattended IPL (IPLRMV) parameter.
  7. Press Enter.

To uninstall fixes for a product, go to the Management Central online help in iSeries Navigator. Click **Help** from the menu bar and select **Help Topics**. Select **What can I do with . . .?** to find out what you can do and where you need to be in the iSeries Navigator window to make it happen.

## Remove IBM i5/OS fixes

Find out how to remove one or more i5/OS fixes.

For the two types of fixes that exist (immediate or delayed), you can choose to remove them temporarily or permanently. The following table provides instructions for removing the two types either temporarily or permanently.

Immediate		Delayed	
Temporarily	Permanently	Temporarily	Permanently
Type: RMVPTF LICPGM(5722SS1) SELECT(SIxxxxx) RMV(*TEMP) RMVDEP(*YES)  where xxxxx is the fix identifier. If the fix is only temporarily removed, it will be applied again with the next cumulative PTF package.	Type: RMVPTF LICPGM(5722SS1) SELECT(SIxxxxx) RMV(*PERM) RMVDEP(*YES)	1. Type: RMVPTF LICPGM(5722SS1) SELECT(SIxxxxx) RMV(*TEMP) DELAYED(*YES) RMVDEP(*YES)  where xxxxx is the fix identifier.  2. Type the following command and press Enter to do an IPL to the B side:  PWRDWSYS OPTION(*IMMED) RESTART(*YES) IPLSRC(B)	1. Temporarily remove the delayed fix first.  2. Type: RMVPTF LICPGM(5722SS1) SELECT(SIxxxxx) RMV(*PERM) DELAYED(*YES) RMVDEP(*YES)  where xxxxx is the fix identifier.

To uninstall fixes on a single system or on more than one system, go to the Management Central online help in iSeries Navigator. Click **Help** from the menu bar and select **Help Topics**. Select **What can I do with . . . ?** to find out what you can do and where you need to be in the iSeries Navigator window to make it happen.

## Remove Licensed Internal Code fixes

- 1 This topic describes how to remove Licensed Internal Code fixes.

For the two types of fixes that exist, immediate or delayed, you can remove them permanently. The following table shows you the two types of fixes with details for removing them.

Immediate	Delayed
<p>To remove an immediate fix, type:</p> <pre>RMVPTF LICPGM(5722999) SELECT(MFxxxxx) RMV(*PERM) RMVDEP(*YES)</pre> <p>where xxxxx is the fix identifier</p>	<p>To permanently remove a delayed Licensed Internal Code fix that is running on the B side, do the following:</p> <ol style="list-style-type: none"> <li>Type: <pre>RMVPTF LICPGM(5722999) SELECT(MFxxxxx) RMV(*PERM) DELAYED(*YES) RMVDEP(*YES)</pre> <p>where xxxxx is the Licensed Internal Code identifier.</p> </li> <li>Type the following command and press <b>Enter</b> to do an IPL to the B side: <pre>PWRDWN SYS OPTION(*IMMED) RESTART(*YES) IPLSRC(B)</pre> </li> </ol>

**Note:** To remove a Licensed Internal Code fix that is running on the A side, follow the instruction for removing an immediate fix.

To find out what other types of fixes you can remove, go to Remove software fixes.

---

## Work with software agreements and licenses

- | Use this information to learn how you and IBM can manage the usage, documentation, and the maintenance of software license information for packaged products.

A *packaged product* is a program on your server that was installed by using either the Restore License Program (RSTLICPGM) command or the GO LICPGM menus. A *licensed-enabled* packaged product uses i5/OS software license management functions.

### Notes:

- You have the option to display or print software agreements.
- You can display and change software license information required by IBM usage-based products through the Work with License Information (WRKLICINF) command. Through Management Central you can work with license keys and distribute them across your systems.

## Software agreements and licensing concepts

Any licensed program may be subject to the terms in a software agreement. The i5/OS licensed programs that you use are available through the media distribution set, which includes the standard set, the keyed set, and single sets of products. The keyed set contains products and program options that require software license keys to regulate their use.

Software license agreements and software license keys are foundations for the use and management of licensed programs.

### Software agreements

Software agreements contain important information concerning the use and management of licensed programs. These could include both printed software agreements and online software agreements.

IBM licenses software to you, either as an individual or an entity, through legal agreements (software agreements). Before you install or use V5R4 Licensed Internal Code and the i5/OS operating system, you must accept the online software agreements for them. Other IBM licensed programs may have software agreements that need to be accepted before the licensed programs can be installed.

If you have non-IBM licensed programs to install on your server, you could be required to accept the terms of an online software agreement for them as well.

Software agreements for IBM or non-IBM products can be displayed or printed through the Work with Software Agreements (WRKSFWAGR) command.

- | If you are a software provider who wants to present license terms prior to the installation of your software product, you may do so by generating a software agreement and then associating it with your product by using either Management Central or software product APIs. For instructions, see “Generate software agreements for your own products” on page 68.

#### **Related tasks**

Required: Accepting software agreements

### **Software license keys**

When you install, upgrade, or move certain licensed programs in the keyed set of products, you must install software license keys.

- | Software license keys are designed to regulate the use of priced licensed programs. You must install these keys when you install, upgrade, or move certain keyed, licensed-enabled packaged products. You might be required to install these keys when you change software machine groups, add additional licenses, or purchase new software that requires a license key.

IBM provides a 70-day trial period for certain keyed IBM products during which you can try a product without a key. However, after the 70-day trial period, you must load a license key to continue to use the licensed program. The 70-day period starts from the day of the first use of the IBM licensed program.

If you have lost your license key or need an emergency license key, you can order these through the software key center for your country or region. For these special situations, IBM can ship the license key through electronic mail (e-mail), telephone, fax, or Internet delivery.

With each keyed product that you order, you will receive a software license key sheet.

- | Each keyed product or feature has its own key. You can add license key information by using the Work with License Information (WRKLICINF) command. For instructions, see “Add license key information” on page 64.

#### **Related concepts**

Software licensing and licensed programs for logical partitions

Considerations for i5/OS license agreements

#### **Related information**

IBM license management support Web site

### **Plan for software licensing**

- | You can track trends in the usage of licensed-enabled packaged products that are currently installed on your server.
- | You can then use this information to determine what you need to purchase for the next software upgrade.

## Determine the usage limit for products not in the keyed set

- | To determine the number of licenses you need to purchase for the next release of a product that is not in the keyed set, you can use the Work with License Information (WRKLICINF) command.

The usage limit of a licensed-enabled packaged product must be set greater than or equal to the peak number of licensed users for the product.

You can track license information over a period of time to determine if the peak occurs at certain times or under certain conditions. It might be possible to reduce the peak usage by changing product usage during these peak times. The WRKLICINF command displays the current usage count and the peak usage for each product. To track peak usage, reset the peak usage on a regular basis by using option 10 (Reset peak usage) on the WRKLICINF command display.

For more detailed information on usage, you can turn logging on for a particular licensed-enabled packaged product. To turn logging on, specify LOG(\*YES) on the Change License Information (CHGLICINF) command. Whenever the usage limit is exceeded, this usage information is logged to journal QLZALOG. The log information contains the usage limit, current usage, and the list of license users at the time the usage limit is exceeded. To view the log, use the Display Journal (DSPJRN) command. Specify L for the journal code and LU for the entry type. Model output files for this journal entry type are QALZALU and QALZALU4 in library QSYS.

## Determine the usage limit for products priced by processor

Determine usage of some licensed-enabled packaged products based on the number of processors you have configured to logical partitions.

The usage of some software products may be counted based on the total number of processors that are configured to the logical partitions in which the products run. These are licensed-enabled packaged products that have a usage type of \*PROCESSOR. You can view the usage type of these products by using the Work with License Information (WRKLICINF) command. Use option 5 (Display detail) to display the license information detail.

- | To determine the usage limit for \*PROCESSOR usage-type products on either IBM eServer i5 or IBM eServer p5 servers, see Requirements for i5/OS on IBM eServer p5 servers .

## Manage software agreements and license keys

- | Before you can install or use V5R4 Licensed Internal Code and the i5/OS operating system, you are required to accept the online software agreements for these licensed programs.

Software agreements for other IBM licensed programs also need to be accepted before the licensed programs can be installed.

### Accept software agreements

To install certain licensed programs, you must accept software agreements for them.

- | Before you can install V5R4 Licensed Internal Code and the i5/OS operating system, you are required to accept the online software agreements for them. Other licensed programs that have online software agreements also need to have their agreements accepted before the installation.
- | If you have the V5R4 release on your server and you want to install other licensed programs, follow the instructions in the topic, Installing additional licensed programs. These instructions include accepting the online software agreements for the licensed programs that require them.

If you are a software provider who wants to present terms before the installation of your packaged software product, you may do so by generating a software agreement and then associating it with your product by using Management Central or software product APIs. For instructions, see “Generate software agreements for your own products” on page 68.

#### **Related tasks**

Required: Accepting software agreements

Installing additional licensed programs

### **Display or print your software agreements**

Use the Work with Software Agreements (WRKSFWAGR) command to display or print your software agreements.

The Work with Software Agreements display allows you to work with a list of installed licensed programs that have software agreements. These agreements can be printed or displayed in different languages provided by the software provider.

### **Prepare software agreements for transfer of ownership**

If you are transferring a server or logical partition to a new owner, use the Work with Licensed Programs menu to transfer ownership of the V5R4 software agreements.

This task is performed by IBM Business Partners or anyone who intends to transfer ownership of an entire server or logical partition with V5R4 installed to a new owner. This is the final task before the server or logical partition is powered down.

1. On the command line, type `GO LICPGM` and press Enter. The Work with Licensed Programs display appears.
2. From the Work with Licensed Programs (LICPGM) menu, select option 31 (Prepare software agreements for transfer of ownership) and press Enter. A confirmation display appears. Continuing with the task will power down the server or logical partition.

The new owner accepts the software agreements during the initial program load (IPL) to enable the server or logical partition to be used.

### **Display and change software license information**

Add license key information and set the usage limit for your licensed-enabled packaged products.

After you install your licensed-enabled packaged products, use the following functions from the Work with License Information (WRKLCINF) command to continue to manage software license information on your server:

#### **Add license key information:**

To use a keyed, licensed-enabled packaged product beyond the trial period, load the license key and other required information.

You can use the Work with License Information (WRKLCINF) command to add your license key information for your licensed-enabled packaged products. The WRKLCINF command allows you to load the license key and other required information to use a product beyond its trial period.

To add your license key information, do the following:

1. Type `WRKLCINF` and press Enter.
2. On the Work with License Information display, type a 1 in the option column next to the product identification number to add license key information for a program. Press Enter.

3. On the Add License Key Information (ADDLICENSE) display, type the required information and add the license key information. Some fields may already contain the required information, such as the product identifier, license term, and system serial number. The 18-character license key is typed into three fields:
  - In the first field, type in characters one through six.
  - In the second field, type in characters seven through twelve.
  - In the last field, type in characters 13 through 18.

In the usage limit field, type in the number of authorized users or the value \*NOMAX.

**Note:** You will need \*ALLOBJ authority in your user profile to supply the license key information. If you experience a problem with the key provided, contact your software provider.

#### *License key repository:*

The license key repository stores product license key information for each unique licensed-enabled packaged product, license term, feature, and system. The repository can contain license keys for any system, and the product need not be installed.

If the product is installed on the system when you add license key information to the repository and the license is for this system, the ADDLICENSE command also installs the license key. When you install the license key, the product's current usage limit is changed to the usage limit that is specified by the license key. The expiration date is also set.

If the license key information already exists in the license key repository for a product that is being installed, the license key information is installed as part of the product installation process.

#### **Set the usage limit:**

After you complete the installation process and before you make the server available to all users, you must set the usage limit for the license-managed products that are not in the keyed set.

For IBM, these products are listed on the Proof of Entitlement (POE), invoice, or other document that you have received with your software order. You can set the usage limit for license-managed products that are not in the keyed set by using the Work with License Information (WRKLICINF) command.

To set your usage limit, do the following:

1. Type WRKLICINF and press Enter.
2. On the Work with License Information display, press F11 (Display Usage Information). The usage limit number on each product that is listed on the POE, invoice, or other documents must match the usage limit number on the Work with License Information display for the associated product.
3. Move the cursor to the line that contains the product name whose usage limit is to be updated.
4. Type 2 (Change), and press Enter.
5. When the Change License Information display is shown, update the usage limit prompt with the usage limit shown on the POE. In addition, update the threshold prompt with either \*CALC or \*USGLMT. Do not leave the threshold set to zero.

**Note:** If the following message is sent, respond by typing G. CPA9E1B: Usage limit increase must be authorized. Press help before replying (C G).

6. If the POE lists more products than the Work with License Information display, set the usage limits after you install those products.

#### **Distribute software license keys**

You can distribute software license keys from one central site system to another system.

You do this by creating a file to automatically load the software license information to the other server during a software upgrade. The topics, Prepare software license information for central site distribution or Distribute software license information using iSeries Navigator describe how to create a license information file.

---

## Manage software inventory

- | It is important that you keep your inventory current on your central system to keep an up-to-date view
- | of the fixes on the systems that you are managing.

When you collect your fixes (and fix group) inventory, you also collect software inventory. After you have refreshed your inventory, you can use the Management Central search function to find a specific fix. You can use an asterisk (\*) as a wildcard.

In addition to managing the fixes inventory for your business, you also need software inventory information when you want to do an upgrade. The Software Inventory Utility tool provides you with the correct data about installed IBM products and can therefore assist you in determining what software can be ordered.

Finally, with iSeries Navigator, you can use your software inventory to view the following types of products:

### Installed Products

Displays a list of the software products that are currently installed on the selected system. You can right-click on any software listed and select **Properties** to view additional information. You can send these products to one or more endpoint systems or system groups and install them on those systems. You can download fixes for an installed product regardless of whether or not its status is "Installed and supported".

### Supported Products

Displays a list of the software products that the selected system currently supports for the other systems that it manages in the network. For example, this list can contain products that are not installed on this system. A system that provides support typically orders the fixes and sends them to systems where the product is installed.

If a product is installed, you can send this product to one or more endpoint systems or system groups and install it on those systems. You can also upgrade a software product that is installed and supported and still have the fixes from the previous release available in a save file. You would be concerned about this on the system you are using for your source system when distributing fixes. This would be necessary if you had to support several different releases within your network.

- | You can add support for a product whether or not it is installed on your system. When you add
- | a product to the Supported Products list, you can copy save files to the source system for fixes to
- | that product, even though the product is not installed. You can then send (or send and install)
- | these fixes to other systems in your network.

- | **Note:** Products that are installed on your system are not automatically supported after an
- | upgrade to a new release. If you want to keep the PTF save files for currently installed
- | products after an upgrade, add support for your currently installed products before the
- | upgrade.

For instructions on adding support, see "Add fix support for a software product" on page 34.

- | The following examples show how to use the inventory function to become more efficient in your daily
- | work:

- Search multiple systems in very little time to find what systems have a certain product or fix installed.



- Export the software inventory of all your systems at the same time into a spreadsheet and keep track of the status of your systems on a regular basis.
- Use the compare and update function to compare fixes on multiple systems. iSeries Navigator will send the missing fixes to the target systems and install them for you. For more information, see “Compare and update fixes” on page 35.
- Collect your inventories and electronically send them to IBM to be used for problem analysis and problem prevention functions and to assist IBM in providing improved service. The inventory collection and transmission function is available from iSeries Navigator with Extreme Support.

#### **Related concepts**

“Display an inventory of fixes on your server with Management Central” on page 53  
Use iSeries Navigator to collect and display an inventory of fixes on your server.

#### **Related tasks**

Work with inventory

---

## **Build and manage your own software products**

In addition to managing IBM products, you can create and manage your own products.

- | iSeries Navigator provides a function called *Management Central* that helps you do that. Management Central provides many tools that you can use to manage IBM and non-IBM installed software products.
- | Use Management Central to package and send software products, generate fixes, generate online software agreements, and generate license keys.

iSeries Navigator gives you the resources to use Management Central to create your own products and install them throughout your network. For your own products, you can create, distribute, and install your fixes across your network. You can also use the security capabilities of object signing and signature verification to protect and verify the integrity of a variety of i5/OS objects when you distribute packages for other systems to use.

#### **Related concepts**

Management Central

#### **Related tasks**

Object signing and signature verification

## **Package and send your own software products**

Packaging and distributing your products makes your applications into a product that is installed and maintained in the same manner as the IBM licensed programs.

To create and distribute your own products, see Package and send your own software products.

## **Generate fixes for installed products using Management Central**

Use iSeries Navigator to generate fixes for the packaged products that you have defined and installed on your server.

A product is an application program that can be packaged with Management Central. Management Central gives you the capability to package your own products and distribute them to other systems in your network. As is true for most products, once you have installed the product, you can encounter situations when you need to provide fixes to correct problems or potential problems found within your installed product.

To generate fixes for non-IBM software that you have defined and installed, follow these steps:

1. In iSeries Navigator, expand **Management Central**.
2. Expand **Definitions**.

3. Select **Product**.
  4. Right-click the product definition that you want to generate fixes for and select **Generate Fix**. The product definition must have a status of **Installed** or **Managed**.
  5. Specify the appropriate information for the **Generate Fix** dialog. Click **OK**. A fix is created on the source system, but the fix is not yet installed.
  6. Install the fix. (See “Install fixes” on page 27).
- For information about what criteria an object must meet to be part of a fix, see the Create Program Temporary Fix API available from the software product APIs.

## Generate software agreements for your own products

- To present license terms before you install a non-IBM software product, you generate a software agreement and then associate it with your packaged product. To do this, you use either Management Central or software product APIs. Users then accept the software agreement to continue with the installation of the software product.

Independent software providers can create online software license agreements. A user is then required to accept the software agreement to complete the installation.

To create a software agreement, you begin by creating the directory for your documents in the /QIBM/UserData/LicenseDoc directory. Choose a name that is unique from any other agreement from any other vendor. Consider using your product identifier, version, release, modification, and option as part of the name. For example, you could use the Work with Object Links (WRKLNK) command and create the MyProdIDVRMOptDoc1 directory.

You then create one or more language versions of the software agreement in this directory. A document's name begins with the directory name and has a language suffix appended. For example, MyProdIDVRMOptDoc1\_en for an English version of the agreement, and MyProdIDVRMOptDoc1\_ja for a Japanese version.

The software agreement documents need to be created in UCS-2 Unicode, specifically UTF-16. The Unicode coded character set identifier (CCSID) is 13488. To create the documents, you can use the edit function under the WRKLNK command, as well as variety of PC tools. If you use a tool that generates UTF-16, it needs to be BigEndian.

To use the WRKLNK command to create a software agreement document in the MyProdIDVRMOptDoc1 directory, do the following:

1. Select Option 2 (Edit) against your MyProdIDVRMOptDoc1 directory.
2. Under the new file prompt, type MyProdIDVRMOptDoc1\_en for the file name and press Enter to edit.
3. Before entering text, select F15 (Services).
4. Select option 3 and change the CCSID to 13488. Press Enter.
5. Select option 5 and change the stream file EOL option to \*CRLF.
6. Press F3 to edit your agreement. Make sure that no characters go past column 76 (either single wide or double wide).
7. Press F2 to save and then press PF3 to exit.

- Details on how to format the agreement, the naming requirements, and languages supported are described in the Create Product Load (QSZCRTPL) API.

### Related tasks

Package and send non-IBM software

### Related reference

Software product APIs

## Generate license keys for your own products

Use this information to find out how to generate software license keys to allow access to your own products.

If any of your own products require keyed compliance, you need to create software license keys for them. A valid license key for each of these products must be loaded on the server so that users can access the product or an option of a product.

To create a license key, use one of the following options:

- If you have IBM System Manager for iSeries on your server, use the Generate License Key (GENLICKEY) command to create a license key. The license key is specific to the product and system information used with this command. The license key is a combination of 18 characters and numbers (A-F and 0-9). The keys are saved in the repository to keep a history of all keys created.
- If you do not have IBM System Manager for iSeries, use the Generate License Key (QLZAGENK) API.

### Related information

System Manager Use

---

## Related information for Maintain and manage i5/OS and related software

Many resources exist to help you manage your fixes and software inventory. This topic will take you to the Web sites for the Software Inventory Utility and the IBM eServer iSeries Support, which includes information about downloading fixes, PSP information, and much more!

### Manuals

Listed below are the iSeries information sources and Web sites that relate to the Maintain and manage software topic.

- Backup and Recovery Guide 

This guide provides general information about recovery and availability options for the iSeries server. It describes the options available on the system, compares and contrasts them, and tells where to find more information about them.

Note that the Backup and recovery category in the information center contains information on how to plan a backup and recovery strategy, how to set up disk protection for your data, how to back up your system, and how to control your system shutdown in the event of a failure. It also includes information about the Backup, Recovery, and Media Services plug-in to iSeries Navigator.

- System Manager Use  (about 415 pages)

This document provides information about using the System Manager licensed program to handle fixes, install and distribute products, and maintain software applications. This is a separately orderable product.

### Web sites

There are a variety of Web sites you can use to find more information about managing and maintaining software and licensed programs. These include:

- IBM eServer iSeries Support 

The IBM Service Support Web site takes you to information such as ordering and downloading fixes.

- Software Inventory Utility 


To help you determine what software can be ordered when you want to do an upgrade, go here to find out about installed IBM products.

## **Saving PDF files**

To save a PDF on your workstation for viewing or printing:

1. Right-click the PDF in your browser (right-click the link above).
2. Click **Save Target As** if you are using Internet Explorer. Click **Save Link As** if you are using Netscape Communicator.
3. Navigate to the directory in which you would like to save the PDF.
4. Click **Save**.

## **Downloading Adobe Acrobat Reader**

You need Adobe Acrobat Reader to view or print these PDFs. You can download a copy from the Adobe Web site ([www.adobe.com/products/acrobat/readstep.html](http://www.adobe.com/products/acrobat/readstep.html)) .

### **Related reference**

“Printable PDF” on page 2

Use this to view and print a PDF of this information.

---

## Appendix. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing  
IBM Corporation  
500 Columbus Avenue  
Thornwood, NY 10594-1785  
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation  
Licensing  
2-31 Roppongi 3-chome, Minato-ku  
Tokyo 106, Japan

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation

Software Interoperability Coordinator, Department 49XA  
3605 Highway 52 N  
Rochester, MN 55901  
U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

- | The licensed program described in this information and all licensed material available for it are provided
- | by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement,
- | IBM License Agreement for Machine Code, or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

All IBM prices shown are IBM's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

#### COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. You may copy, modify, and distribute these sample programs in any form without payment to IBM for the purposes of developing, using, marketing, or distributing application programs conforming to IBM's application programming interfaces.

- | SUBJECT TO ANY STATUTORY WARRANTIES WHICH CANNOT BE EXCLUDED, IBM, ITS
- | PROGRAM DEVELOPERS AND SUPPLIERS MAKE NO WARRANTIES OR CONDITIONS EITHER
- | EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR
- | CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND
- | NON-INFRINGEMENT, REGARDING THE PROGRAM OR TECHNICAL SUPPORT, IF ANY.
  
- | UNDER NO CIRCUMSTANCES IS IBM, ITS PROGRAM DEVELOPERS OR SUPPLIERS LIABLE FOR
- | ANY OF THE FOLLOWING, EVEN IF INFORMED OF THEIR POSSIBILITY:

- | 1. LOSS OF, OR DAMAGE TO, DATA;
- | 2. SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES, OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; OR
- | 3. LOST PROFITS, BUSINESS, REVENUE, GOODWILL, OR ANTICIPATED SAVINGS.

| SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO SOME OR ALL OF THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

Each copy or any portion of these sample programs or any derivative work, must include a copyright notice as follows:

© (your company name) (year). Portions of this code are derived from IBM Corp. Sample Programs. © Copyright IBM Corp. \_enter the year or years\_. All rights reserved.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

---

## Programming Interface Information

This Maintain and manage i5/OS and related software topic documents intended Programming Interfaces that allow the customer to write programs to obtain the services of IBM i5/OS (product number 5722-SS1).

---

## Trademarks

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

- | e(logo)server
- | eServer
- | IBM
- | iSeries
- | i5/OS

Windows and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Other company, product, and service names may be trademarks or service marks of others.

---

## Terms and conditions

Permissions for the use of these publications is granted subject to the following terms and conditions.

**Personal Use:** You may reproduce these publications for your personal, noncommercial use provided that all proprietary notices are preserved. You may not distribute, display or make derivative works of these publications, or any portion thereof, without the express consent of IBM.

**Commercial Use:** You may reproduce, distribute and display these publications solely within your enterprise provided that all proprietary notices are preserved. You may not make derivative works of these publications, or reproduce, distribute or display these publications or any portion thereof outside your enterprise, without the express consent of IBM.

Except as expressly granted in this permission, no other permissions, licenses or rights are granted, either express or implied, to the publications or any information, data, software or other intellectual property contained therein.

IBM reserves the right to withdraw the permissions granted herein whenever, in its discretion, the use of the publications is detrimental to its interest or, as determined by IBM, the above instructions are not being properly followed.

You may not download, export or re-export this information except in full compliance with all applicable laws and regulations, including all United States export laws and regulations.

IBM MAKES NO GUARANTEE ABOUT THE CONTENT OF THESE PUBLICATIONS. THE PUBLICATIONS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.







Printed in USA