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iSeries

Maintain and manage software





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iSeries

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Software and licensed programs

This information 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 the OS/400 release and related software topic in the Information Center.



There are several key reasons why managing these areas is so important:

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.

If you want to work with non-IBM products, you can use Management Central to create your own products and install them throughout your network. With Management Central you can manage your fixes for IBM products and non-IBM products, which means you can create, distribute and install the fixes throughout your network. Management Central also provides you the support to manage IBM licensed programs.

One way to help you manage these areas is to develop an effective strategy for managing and maintaining software. To develop an effective strategy, do the following:

Use software fixes

Keep your iSeries operating system and other software current with fixes (or program temporary fixes, PTFs). Fixes play an important part in your system's maintenance strategy. They give you a chance to reduce system downtime, add functionality, and provide optimal availability.



Work with software licensing

Learn about the different types of software agreements and license keys. Find out what you need to do to perform licensing tasks such as evaluating software usage or displaying and changing software license information.



Manage software inventory

Why should you care about inventory? Inventory is not just a record-keeping mechanism.

Management Central uses inventory in many ways to help speed up your daily work. The Software Inventory Utility tool provides you with correct data about installed IBM products and therefore assists you in determining what software can be ordered when you want to do an upgrade.

Manage software products

Management Central provides many tools that you can use to manage non-IBM installed software products. Use Management Central to package and send software products, generate fixes, and generate online software agreements.

Related information

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 iSeries and AS/400 service and support, which includes information about downloading fixes, PSP information, and much more!

See the What's new topic for the new and changed information and see the Print this topic if you want to print the PDF for this entire topic.

What's new for V5R2

This topic highlights the changes for software and licensed programs:

Command interface

- The Copy PTF Group (CPYPTFGRP) command allows you to copy PTF groups.
- The Work with PTF Groups (WRKPTFGRP) command allows you to view a PTF group.

Management Central fixes management

- When you use the Compare and Update wizard, you can choose not to view the compare results but instead update the target systems with installed fixes from products on the model system. If you want to view the compare results, you must have the inventory for the model and target systems. If you want to perform only an update, then you need inventory information for only the model system.
- The Compare and Update wizard allows you to retrieve a list of fixes that are installed on the model system and not installed on the target systems. You can send and install the fixes on the list to the target systems or you can now choose to view and print the list.
- The Compare and Update wizard generates a full list of missing fixes when you select the update action. The wizard checks the save file status for those missing fixes in the inventory for the source system. If any fixes do not have save files, those fixes are deselected. You can reselect those fixes if you know the inventory is out of date, or you can deselect any fix that you do not want included in the update.
- You can manage the fixes that are listed in a PTF group as well as the group itself on multiple systems. For example, the tasks for sending, sending and installing, and installing fixes also apply to fix groups.
- You collect fix group inventory when you collect your fixes inventory.
- You copy fix groups from media when you copy your fixes.
- When you perform a basic search for the fixes inventory, you search fixes and fix groups. The search of the fixes includes the fix and product fields. The search of the fix groups includes the fix group and description. No advanced search options are available at this time.

Management Central product packaging

When you create a product that you have defined, you can do the following:

- Digitally sign all product and fix objects, which can protect the files of the product that you defined.
- Include license documents, which will require users to agree to the license terms before they can install the product.

Application programming interfaces (APIs)

- Create PTF groups with the Create PTF Group (QpzCreatePtfGroup) API.
- Delete PTF groups with the Delete PTF Group (QpzDeletePtfGroup) API.
- List information for a specific PTF group on a system with the List PTF Group Details (QpzListPtfGroupDetails) API.
- Show a list of all PTF groups that are known to the system with the List PTF Groups (QpzListPtfGroups) API.



Online license agreements

IBM software licensing agreements are printed documents that could include the International Program License Agreement, the Licensed Information Document, and the International License Agreement for Evaluation of Programs. IBM is in the process of migrating these printed documents to online information. For V5R2 IBM products, you will see the same printed versions as in previous releases.

If you have non-IBM licensed programs to install on your server for V5R2, however, you might see an online software agreement. You will need to accept this agreement to be able to continue with the installation.



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



Print this topic

To view or download the PDF version, select Software and licensed programs (about 224 KB or 65 pages).

You can also view or download these related topics:

- Basic system operations (about 230 KB) contains the following topics:
 - iSeries basic operations
 - OS/400 concepts
 - Analyzing and reporting system problems
- Software installation information (use the following two sources together):
 - Install the OS/400 release and related software PDF (about 80 pages) The topic describes the various concepts, preparation steps, and recovery steps for software installation and is under Installation, upgrades, and migration in the left navigation bar. It contains the following information:
 - Concepts
 - Install the OS/400 release and other software
 - Software reference
 - Troubleshoot
 - Software Installation



manual (about 250 pages) This document contains instructions for installing OS/400 and licensed programs. It also contains procedures to add secondary languages, additional licensed programs, and to change the primary language on the server.

Other information

You can also view or print any of the following PDFs:

- Manuals:
 - 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^(TM) 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.

- Redbooks:
 - Managing AS/400 V4R4 with Operations Navigator



(about 500 pages)

- Management Central: A Smart Way to Manage AS/400 Systems



(about 240 pages)

- IBM eserver iSeries Universal Connection for Electronic Support and Services



(about 220 pages)

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...**
3. Navigate to the directory in which you would like to save the PDF.
4. Click **Save**.

Downloading Adobe Acrobat Reader

If 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)



Use software fixes

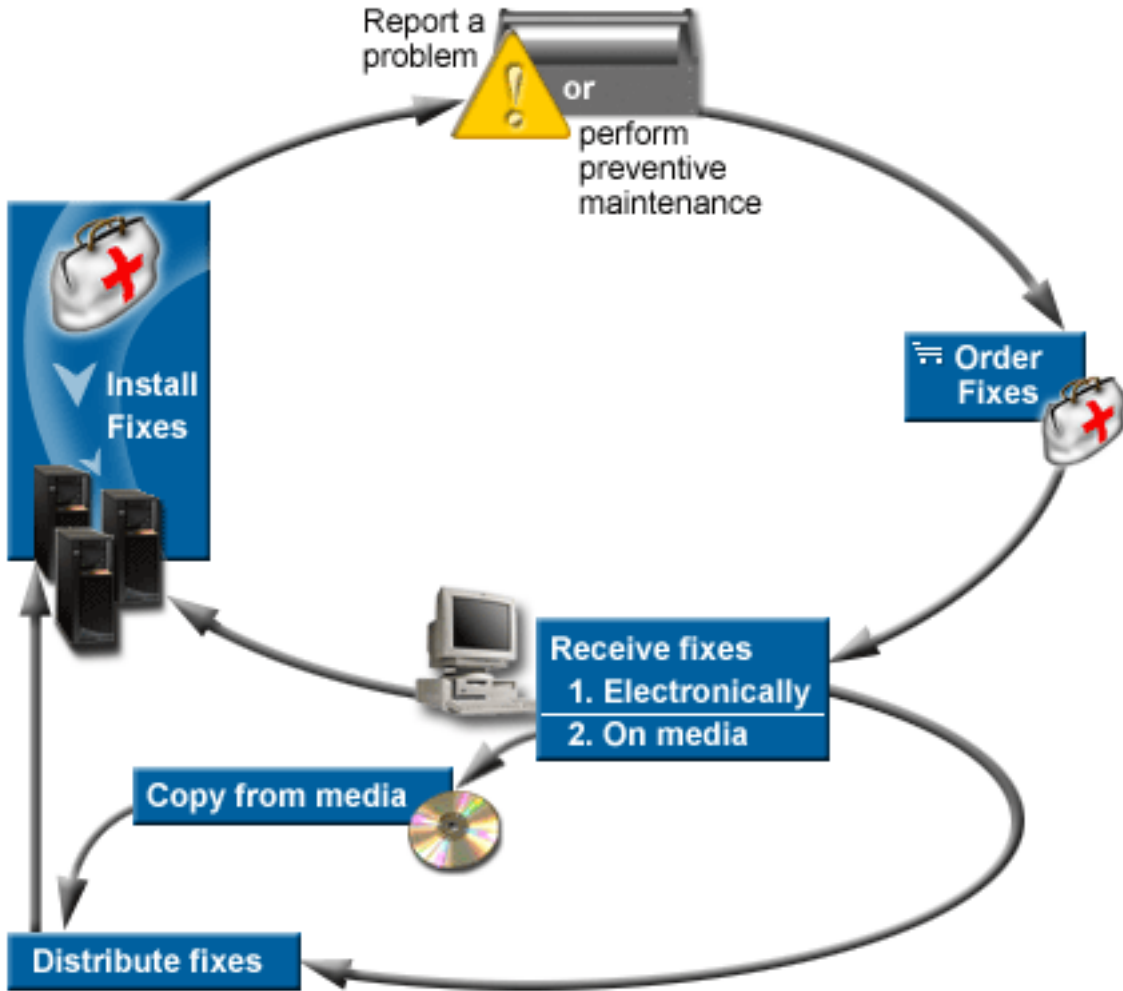
Periodically, problems are discovered in iSeries programs. IBM issues a fix (also known as a PTF, or program temporary fix) to correct the problem. Multiple fixes are bundled together to form a cumulative PTF package, which contains certain recommended fixes. Cumulative PTF packages should be installed 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. They give you a chance to 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 make a fix available on the system immediately—or delay the installation if you choose. You can also use the compare and update wizard to compare a model system to multiple target systems to find missing or extra fixes throughout the system.

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.** If you received the fixes electronically, you can install them now.
5. **Redistribute and install.** 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.



The information that you need to work with software fixes can be found within the following topics:

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.

Plan your fix management strategy

Establish a maintenance strategy to reduce the impact to OS/400 operations that result from unplanned outages or program failures.

Determine which interface to use

With the emergence of iSeries Navigator, you need to be aware of which tasks are supported by the character-based interface versus iSeries Navigator.

Order fixes

There are a variety of methods you can use to order fixes: traditional OS/400 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.

Display fix information

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. Use this information to find out where to go to find specific information about your fixes.

Install fixes

Whether you are installing fixes on single systems, remote systems, or systems with logical partitions, there are a series of steps you must follow to effectively install your fixes. Use this topic to find scenario information about installing fixes, then follow the tasks required for installing fixes successfully.

Work with fix cover letters

Working with with fix cover letters includes ordering, copying, displaying, and printing.

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.

Remove fixes

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

Fixes concepts and terms

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.

For more information about the concepts and terms associated with fixes, see the following topics:

Types of fixes

IBM provides you with a variety of fixes — cumulative PTF packages, fix groups, HIPER fixes, and more. Find out about each fix and when you should use them.

Fix cover letters

IBM sends you cover letters with your fixes. Each cover letter contains important information.

Fix save files

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

Status information

Just like there is separate terminology for PTFs and fixes, there are two sets of statuses to represent the fix status for the character-based interface and the iSeries Navigator interface. Use this topic to find out more about what each fix status means in your environment.

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.

Types of fixes

Many different kinds of fixes exist, and 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 are applied to correct specific reported problems. A high-impact pervasive (HIPER) PTF is an example of a single PTF that resolves a problem that may have a high impact on the operations of your server or a low-impact pervasive problem that affects most iSeries servers.

Cumulative PTF packages

Cumulative PTF packages contain fixes for a given release of the OS/400 operating system and associated licensed programs. You should install the entire cumulative PTF package after you first load or reload the operating system.

Fix groups

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

Service packs

Service packs are different from group PTFs. A service pack is a collection of code fixes (not PTFs) for iSeries Access for Windows products that is contained in a single OS/400 PTF.

Single fixes: Single fixes are applied to correct specific reported problems. Single fixes are available on media, or are capable of being downloaded with electronic customer support or from the Internet. Examples of single fixes are:

High-impact pervasive (HIPER) PTF

A HIPER PTF resolves a problem that may have a high impact on OS/400 operations or a low-impact pervasive problem that affects most iSeries servers

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.

Corequisite fix

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

Distribution requisite fix

A distribution requisite fix is required for distribution purposes only.

Delayed and immediate fixes

Some fixes can be applied without requiring an IPL, and some fixes can be applied only during an IPL. Find out about delayed and immediate fixes.

To find out about other kinds of fixes, see *Types of fixes*.

HIPER PTFs: 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 are the following:

- Your system may crash or hang and requires a restart or IPL (initial program load) to recover.
- Your system may be stuck in a looping condition.
- Your system's data integrity may 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, you should order and install the HIPER fixes. For a complete listing of HIPER fixes, see the Preventive Service Planning Information web

site



To find out about other kinds of fixes, see [Types of fixes](#).

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.

To find out about other kinds of fixes, see [Types of fixes](#).

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.

To find out about other kinds of fixes, see [Types of fixes](#).

Distribution requisite fix: A distribution requisite fix is required for distribution purposes only. A distribution requisite fix is sent and installed only if it is named by a fix listed in a fix group and you are using that fix group to send or install fixes. If you are sending only a fix, then the distribution requisite fix is not sent and installed. The system does not require you to apply distribution requisites.

To find out about other kinds of fixes, see [Types of fixes](#).

Delayed and immediate fixes: Some fixes can be applied without requiring an IPL. These fixes are called immediate PTFs. Some fixes can be applied only during an IPL. These are called delayed PTFs. Immediate PTFs can also be applied during an IPL. The cover letter tells you if the PTF is immediate or delayed.

Delayed

Some fixes cannot be applied immediately because the licensed programs they affect are active. These fixes are called delayed fixes and can be applied only at the next IPL. Delayed fixes that affect the Licensed Internal Code can be applied immediately when running on the A storage area.

Immediate

Immediate fixes can be applied without doing an IPL if the objects that they affect are not in use, or may be applied when you do the next IPL.

To find out about other kinds of fixes, see [Types of fixes](#).

Cumulative PTF packages: Cumulative PTF packages contain fixes for a given release of the OS/400 operating system and associated licensed programs. 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. Most of the fixes that are designated as HIPER PTFs are included in cumulative packages.

How often a cumulative package is available depends on the stage of the OS/400 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 OS/400 release has been available for approximately two years, the frequency may 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. You should also consider installing cumulative fix packages prior to making major hardware or software changes to your environment.

To find out about other kinds of fixes, see [Types of fixes](#).

Fix groups: A PTF group, or fix group in iSeries Navigator terminology, consists of a list of PTFs defined for the purpose of managing those PTFs as one entity. A PTF group can identify other PTF groups called related PTF groups. For a complete listing of PTF groups, see the Preventive Service Planning Information web site



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.

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

Order PTF groups

Use the Send PTF Order (SNDPTFORD) command to order your PTF groups.

Create PTF groups

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

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.

To find out about other kinds of fixes, see [Types of fixes](#).

Related fix group: 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.

To find out about other kinds of fixes, see [Types of fixes](#).

Service packs: A service pack is a collection of code fixes for iSeries Access for Windows. For specific service pack information, see the following:

iSeries Access web site



The 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.

Administering service packs

Find out how to check the service level, how to obtain the latest service pack, and how to install it.

To find out about other kinds of fixes, see Types of fixes.

Fix save files

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.

You can copy all or selected PTFs for installed and supported products from a device into PTF save files with the Copy from Media function that is available from iSeries Navigator. You must perform this copy function for PTFs that are received on media; otherwise, you cannot send your fixes to other systems.

Note: If you received your fixes electronically, you already have the save files for your fixes.

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. You should consider deleting your save files after the fix has been permanently applied 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.

Statuses of fixes on your server

After you order your PTFs and begin installing them, you will want to be able to track their status. 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. Go to the following topics to learn more about the specific statuses:

iSeries Navigator fix status descriptions

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

Command interface fix status descriptions

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

Fix order status

You reported a problem with the Work with Problem (WRKPRB) command. Continue to track the status of the problem with the WRKPRB command.

To help you decide whether to use the iSeries Navigator interface or the command interface to work with your fixes, go to the Determine which interface to use.

Fix statuses: iSeries Navigator fix status descriptions: The fix management function available through iSeries Navigator 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 DSPPTF command, some statuses are different. The following tables provide a detailed description of the fix and fix group statuses that are available in Management Central. Keep in mind that 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 command-based interface but are now using iSeries Navigator.

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. You cannot distribute the fix to other systems if it does not exist as a save file.	Save file only or Not applied
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	The fix has been replaced by a later fix.	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
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

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
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

To read about other related topics, see the following:

Command interface fix status descriptions

If you are more familiar with the OS/400 commands and menus, you can find out more about those status descriptions here.

Determine which interface to use

Find out which tasks can be done with OS/400 commands and menus or with iSeries Navigator.

Fix statuses: Command interface 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.
Not applied	PTF has been loaded but not applied, or has been temporarily removed.
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 - 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 - 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 - 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.
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.

Status	Description
Superseded	PTF has been replaced by a later PTF. 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.

To read about other related topics, see the following:

iSeries Navigator fix status descriptions

Find out about the status descriptions for iSeries Navigator fixes.

Determine which interface to use

Find out which tasks can be done with OS/400 commands and menus or with iSeries Navigator.

Fix order status: You may have 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, do the following:

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.

Where to find information about fixes

As a system administrator, one of your responsibilities is to maintain your iSeries 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. Each of the following topics identifies what piece of information you need to know and where to find it:

Fix cover letters

Your fix cover letter is one of the most important pieces of information related to fixes. Within the cover letter you can find special instructions that relate to installing your fixes.

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.

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.

Preventive Service Planning (PSP) Information

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

Authorized Problem Analysis Reports (APARs)

Find out what problems have been identified and could result in potential problems. You can view APARs by component, by release, or see the full list.

To find information about the status of fixes on your server, be sure to go to Fix statuses.

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

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

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 what tasks are associated with cover letters, see working with fix cover letters.

Fix summary lists: 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 only send you the fix 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.

You may want to see the fix cross-reference summary list to make sure that you order any fixes for the new release that you had at the previous release.

To order the fix summary list, use the following command:

```
SNDPTFORD SF97vrm
```

where vrm is version, release, and modification level. For Version 5 Release 2 Modification 0, use 520.

Sample text for 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	TCP/IP ACCEPT() FAILS AFTER SECOND LISTEN() 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      MF27432
                                B6000103
MF25902  BASE  04/26/01  OSP VIRTUAL CONTROL PANEL SECURITY CHECK MF27341 S
                                CORRECTION
MF25911  BASE  04/27/01  LIC-INCORROUT JAVA.NET.SOCKET SEND AND      MF27465
                                RECEIVE BUFFER SIZE
MF25916  BASE  04/26/01  INCORROUT-HLIC-94XXDIAG INCORRECT ARRAY      MF27217
                                SIZE
MF25917  BASE  04/27/01  OSP-TCPIP LINK ERROR UNDETECTED BY TCPIP      MF27361 ET
                                ON GIGABIT ETHERNET
                                OSP-TCPIP VL07000070 AFTER FRAME RELAY
                                LINK ERROR
SI00596  1114  08/26/01  FIX *BNDDIR OF ILE COBOL COMPILER           SI01494

```

Fix cross-reference summary lists: 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.

Here is sample text from a fix cross-reference summary list:

SF97043

```

VERSION 4 REL 5.0 TO VERSION 5 REL 1.0 PTF/FIX CROSS-REFERENCE SUMMARY
*****

```

```

VERSION 4 REL 5.0 TO VERSION 5 REL 1.0
PTF/FIX CROSS-REFERENCE SUMMARY - SF97043

```

```

*****

```

DATE OF LAST UPDATE: 5 Dec 2001

```

*****

```

S E C T I O N 1

USE THIS SECTION IF YOU ARE INSTALLING CUMULATIVE PTF PACKAGE C1302510.

	VERSION 4	VERSION 5
	REL 5.0	REL 1.0
PRODUCT	PTF/FIX	PTF/FIX
-----	-----	-----
5798RZG	SF66641	PENDING
	SF66550	SF66643
5769999	MF27526	MF27527
	MF27498	PENDING
	MF27491	MF27474
	MF27487	MF27488
	MF27480	PENDING

To order this list electronically, select the version and release you are moving from and use the corresponding command. See SNDPTFORD command table for the fix cross-reference summary.

Use Preventive Service Planning (PSP) information: Effective use of preventive service planning (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 on a weekly basis. Be sure to use the most recent edition of the PSP information as the IBM software support center provides frequent updates.

How do I obtain PSP information?

You can obtain PSP information using any of the following methods:

- **Obtain PSP information on the Web**
You can go directly to the PSP Web site



or you can access the iSeries and AS/400 Technical Support



home page. If you go to the iSeries and AS/400 Technical Support Web site, you can find the PSP information in the Technical Databases category of information.

- **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: SNDPTFORD SF98vrm
where vrm is version, release, and modification level. For Version 5 Release 2 Modification 0, use 520. You can also use the following:

PSP Document	Command to Order PTF
V4R5M0 software installation	SNDPTFORD SF98050
V5R1M0 software installation	SNDPTFORD SF98060
V5R2M0 software installation	SNDPTFORD SF98070

For Licensed Internal Code: SNDPTFORD MF98vrm
where vrm is version, release, and modification level. For Version 5 Release 2 Modification 0, use 520.

- **Obtain PSP information 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.

What does the PSP information contain?

Preventive service planning information is available for:

- 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 iSeries OS/400 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 the cumulative PTF packages topic.

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 High Impact Pervasive (HIPER) fixes topic.

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.

Printing PSP information on your server

To print PSP information you have ordered and downloaded to your iSeries server, use the instructions for printing and displaying fix cover letters. The PSP information is placed in QAPZCOVER when it is sent to you.

Using authorized problem analysis reports (APARs): 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.

A 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.

Plan your fix management strategy

To most people, preventive maintenance means changing the oil in your car every 3,000 miles, rotating the tires every 10,000 miles, and getting a tune-up every 100,000 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 is an OS/400 maintenance strategy 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. Each server 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 or AS/400 environment and applications. As you develop your strategy, here are some questions that you should consider:

- What are you doing to prevent unexpected failures associated with OS/400 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?

Your preventive maintenance schedule might resemble the following:

Time Frame	Tasks
Daily	<ul style="list-style-type: none">• Run backup procedure• Apply individual fixes as needed
Weekly	<ul style="list-style-type: none">• Order and review Preventive Service Planning (PSP)• Order and apply necessary HIPER PTFs• Print and review hardware error log (PRTERLOG)
Monthly for a changing server or quarterly for a stable server	<ul style="list-style-type: none">• Order current cumulative PTF packages (SF99vrm) or Group PTF packages (SF99nnn) and apply• Do a complete system save• Perform system cleanup functions

Notes:

1. In a stable environment, think about installing the most recent cumulative PTF package every three to four months.
2. Consider installing the most recent cumulative PTF package before making major changes to your system (hardware or software).
3. If you require an excessive number of corrective service fixes, consider installing cumulative PTF packages more frequently.

When you establish a maintenance strategy, you can reduce the effect on the OS/400 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.

You can also review the PTF Management Strategy



document for additional information that iSeries Support



maintains.

Determine which interface to use

The iSeries server offers you many ways to connect to and communicate with the servers in your iSeries environment, which means that several methods exist to perform the tasks related to managing your fixes. With the emergence of iSeries Navigator, sometimes it is difficult to know whether to use the character-based interface or iSeries Navigator to perform these tasks.

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 OS/400 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
Order fixes and fix groups (1)	Yes, Send PTF Order (SNDPTFORD) command.	Not available.
Create fixes	Not available. (2)	Yes, with the generate fix 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 do not need to distribute your fixes, it is recommended that you use the OS/400 commands and menus.	Not available.
Install fixes received electronically	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.
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 (3)	No	Yes, with the Compare and Update wizard or send and install action.
Compare and update fixes	No	Yes, with the Compare and Update wizard or send and install action.
Manage fix groups (4)	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.
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.
Create custom package	Yes, Copy PTF (CPYPTF) command.	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 Cover Letter .
Compare and update fixes	Not available.	Yes, with the Compare and Update wizard.
<ol style="list-style-type: none"> 1. In addition to ordering fixes with the SNDPTFORD command, you can also order fixes from the Internet, by fax, or by voice. 2. The System Manager licensed program allows you to create fixes for your own products. 3. The System Manager licensed program also distributes fixes to other systems in your network. 4. 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.

Order fixes

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 OS/400 service provider from a service requester. The following list identifies these special fix packages and indicates what they are:

- MF98vrn: Hardware Service Planning package
- SF98vrn: Preventive Service Planning package
- SF99vrn: Cumulative PTF package
- SF99xxx: PTF group
- SF97vrn: 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, such as, voice support, Fax, 1-800 number, iPTF, and SNDPTFORD command. More details are provided for iPTF and the SNDPTFORD command. You can find more information about the other methods from Ordering PTFs for your AS/400 or iSeries



website.

Order fixes using the Internet

The iPTF facility 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.

Order fixes using SNDPTFORD

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.

In some special circumstances, you may want to create your own custom fix package for sending, loading, and applying on servers in your network.

Order fixes using the Internet

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.

IBM offers many ways for you to download or order PTFs for your iSeries server or AS/400 system. The various methods are listed here, but you should go to the Internet PTF downloads - iPTF



website for details.

For information on the Send PTF Order command, see Order fixes using the OS/400 command SNDPTFORD.

Order fixes using the SNDPTFORD command

The Send PTF Order (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. To learn more about the Universal Connection, see Configuring Universal Connection support.

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 table below shows how to use the SNDPTFORD command to order the different types of fixes and fix information. You may 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(1)
Fix cover letter only	SNDPTFORD nnnnnnn(1) PTFPART(*CVRLTR)
Cumulative PTF packages	SNDPTFORD SF99vrm(2)
PTF group	SNDPTFORD SF99nnn(3)
PTF summary list	SNDPTFORD SF97vrm(2)
Fix cross-reference summary list VRM450 to VRM510 VRM450 to VRM520 VRM510 to VRM520	SNDPTFORD SF97043 SNDPTFORD SF97044 SNDPTFORD SF97071
PSP information for licensed programs	SNDPTFORD SF98vrm(2)
PSP information for Licensed Internal Code and hardware devices	SNDPTFORD MF98vrm(2)
Notes:	
1. nnnnnnn is the fix identifier. You can order up to 20 fixes at a time.	
2. v is the version, r is the release, and m is the modification level of the system. For Version 5 Release 2 Modification 0, type 520.	
3. nnn is the fix identifier, which can be any number.	

Using the SNDPTFORD command

When you use the SNDPTFORD command, the following process takes place:

1. From the iSeries server command interface, enter the **SNDPTFORD nnnnnnn** command, where nnnnnnn 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 you receive fixes electronically on your service support communications line, they are placed in a save file 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.

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

1. Identify your licensed program release level:
 - a. On any command line, type **GO LICPGM**.
 - b. Press **Enter**.
 - c. Select option 10 (Display installed licensed programs) on the Work with Licensed Programs display.

- d. Press **F11**. The current version, release, and modification level is shown in the Installed Release column where V is the version, R is the release, and M is the modification level.
2. Type **SNDPTFORD SF99VRM**, where VRM is the version, release, and modification level you found in step 1.
For example, for Version 5 Release 2 Modification 0, type SNDPTFORD SF99520.
3. Verify the shipping information on the Verify Contact Information display. If any of the information is incorrect, change it and press **Enter**.
4. 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 next display.
8. Specify the fix medium type by entering the corresponding number.
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 a fix package that contains the ordered fix and its requisites.
- 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.

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

Install fixes

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. If you want information on advanced install topics, see applying PTFs or loading PTFs.

Step 1: Review fix cover letters

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

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.

Step 3: Choose your installation scenario

Find key considerations and tasks for unique fix installation scenarios, including local systems, remote systems, and systems with logical partitions. You can install many kinds of fixes including cumulative PTF packages, HIPER fixes, OS/400 and other licensed program fixes, and fixes for the iSeries Licensed Internal Code.

Step 4: Verify installation

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

Step 1: Review fix cover letters prior to fix installation

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 pre-installation special instructions in any of the cover letters, follow those instructions first.

Your next step

To find information about the next steps for installing fixes on your servers, refer to the Install fixes topic.

Step 2: Prepare your server to install fixes

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.
- 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 for further information.
- 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.

Your next step

To find information about the next steps for installing fixes on your servers, refer to the Install fixes topic.

Determine storage area before installing 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 **dsptf 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:

- On the command line, type **PWRDWN SYS *IMMED RESTART(*YES) IPLSRC(X)**, where X is the storage area you want to select.
- On the control panel:
 1. For systems with a mode button, set the system to the **Manual** mode. For systems without a mode button, start at step 2.
 2. Press the Increment/Decrement buttons until 02 is displayed in the Function/Data display on the control panel.
 3. Press the Enter pushbutton on the control panel.
 4. 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.
 5. Press the Enter pushbutton on the control panel to save the IPL settings.
 6. For systems with a mode button, set the mode to **Normal**.
 7. 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.

Your next step

To find information about the next steps for installing fixes on your servers, refer to the Install fixes topic.

Step 3: Choose your fix installation scenario

You can install fixes in many ways. Some factors that 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). If you want information on advanced install topics, see applying PTFs or loading PTFs.

The topics that follow provide information for the different ways that you can install fixes.

Install cumulative PTF package

Find out how to use the GO PTF menu to install a cumulative PTF package. You can also omit fixes when you install a cumulative PTF package.

Install fixes received electronically

Find out how to use Management Central or the GO PTF menu to install the fixes that you received electronically.

Install fixes from media

Find out how to use Management Central or the GO PTF menu to install the fixes that you received on media.

Distribute fixes to multiple servers

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.

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.

Install fixes from an image catalog

Find out how to use an image catalog to install your fixes.

Install cumulative PTF packages: This topic describes the steps for installing a cumulative PTF package. You should order and install the current cumulative PTF package to keep your server at the most current fix level. You should do this on a periodic basis according to your fix maintenance strategy or when you install a new release of a licensed program.

Note: HIPER PTFs are automatically included in the cumulative PTF package.

To install cumulative PTF packages:

1. Read the fix shipping information letter 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. Type GO PTF from any command line.
4. Type option 8 (Install program temporary fix package) and press Enter. The Install Options for Program Temporary Fixes display is shown.
 - Type optyy, where yy is the name of the CD-ROM drive unit (for example, opt01) where you loaded the fix CD-ROM.
 - If you have additional fixes to install at this time, type an **N** (No) in the Automatic IPL field and install the additional fixes. If you do not have additional fixes to install at this time, type a **Y** (Yes) in the Automatic IPL field.
 - Type 1 for the PTF type.
 - Type Y for Other options. The Other Install Options display is shown.

- Type 1 for Apply Type.

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 could 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, do the following:

1. Type **GO PTF** from any command line.
2. Type 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 using the power on and power off schedules.

Your next step

Verify that the fixes are installed. If there are any post-installation special instructions in the cover letter, follow those instructions at this time.

Install fixes received electronically: Fixes are either sent to your server 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 they are sent over the electronic customer support service link, you receive them as save files, and they are stored in library QGPL. You can use either Management Central or the GO PTF menu to install fixes that you received electronically.

Note: If you receive fixes by any other method, you can use 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.

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**, **Group Fixes**, 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 from 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 Installing cumulative PTF packages topic.

Notes when using the GO PTF menu:

- 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 Applying fixes topic.
- For immediate OS/400 fixes that will be applied immediately without an IPL (initial program load), see the instructions in Applying Immediate Licensed Program or OS/400 PTFs Temporarily or Permanently without an IPL.

Your next step

Verify that the fixes are installed. 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 server 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 they are sent over the electronic customer support service link, you receive them as save files, and they are stored in library QGPL. If the fixes are received on media and you want to distribute the fixes, you need to use the iSeries Navigator Copy from Media function to transfer the fixes into save files and store them in library QGPL. When you receive the fixes and transfer them to save files in library QGPL with the Copy from Media function, all the fix identification information and problem symptom data is stored in the PTF database.

Note: If you receive fixes by any other method, you can use 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.

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**, **Group Fixes**, 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. Type option 8 (Install program temporary fix package) and press Enter. The Install Options for Program Temporary Fixes display is shown.
 - Type optyy, where yy is the name of the CD-ROM drive unit (for example, opt01) where you loaded the fix CD-ROM.
 - If you do not want to install certain fixes, you can omit them by using the procedure identified in the Installing cumulative PTF packages topic.

Notes when using the GO PTF menu:

- 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 Applying fixes topic.
- For immediate OS/400 fixes that will be applied immediately without an IPL (initial program load), see the instructions in Applying Immediate Licensed Program or OS/400 PTFs Temporarily or Permanently without an IPL.

Your next step

Verify that the fixes are installed. 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: After you have ordered and installed 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's 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:

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.

You can distribute fixes to remote systems with the following methods:

Send and install fixes

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

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.

Send and install fixes: 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.

1. Copy your fixes from media.
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**, **Group Fixes**, 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.

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.

Your next step

To find information about the next steps for installing fixes on your servers, refer to the Verify fix installation topic.

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 not copied on to the system. 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. Just 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.

Add fix support for a product: The add support for installed products function gives you the ability, as a service provider, to support a product that is not installed on your system. For example, 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. When a product is supported, you can download fixes or use the Copy from media function to store fixes on your source system without having the product installed. You can then send and install the fixes to your remote systems that have the product installed.

To add support for a product, do the following:

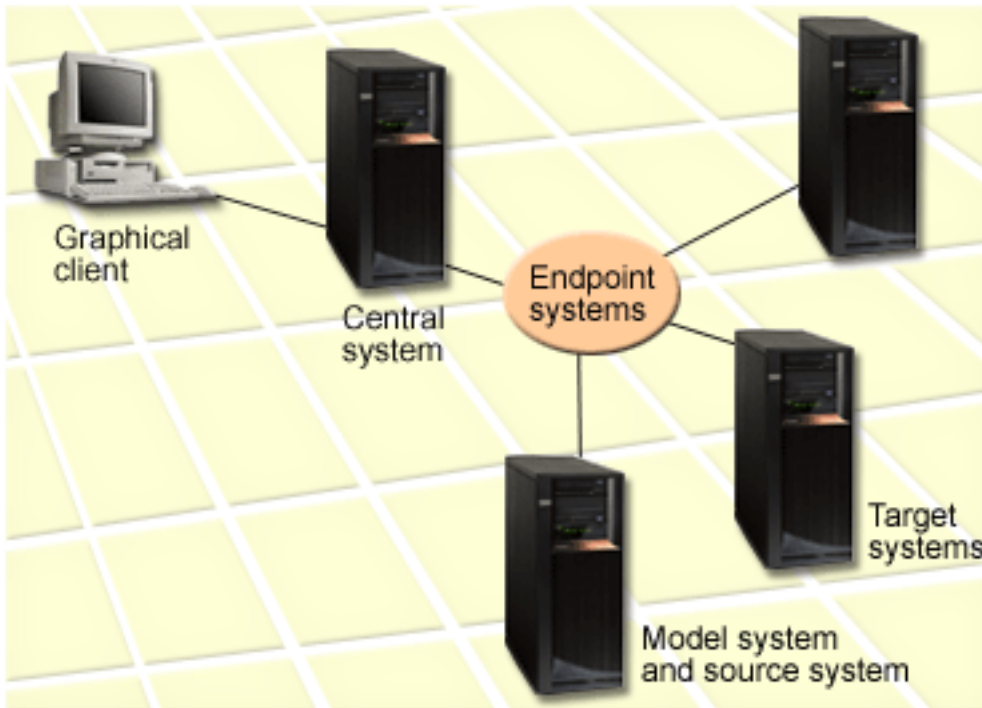
1. Expand **Endpoint Systems**.
2. Expand the endpoint system where you want to add support for a product.
3. Expand **Configuration and Service**.
4. Expand **Software Inventory**.
5. Right-click **Supported Products** and select **Add Support**.
6. Click **Browse** to select from a list of all products 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 is available to add or remove support for installed products.

Compare and update fixes: 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.

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.

Note: Only those fixes identified as missing can be sent and installed. You cannot uninstall extra fixes. You can only display them.

Install fixes on systems with logical partitions: 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.

Installing partition-sensitive fixes

There are certain partition-sensitive fixes that apply specifically to the lowest level code that controls logical partitions. Partition specific fixes will have special instructions referring to how to apply these fixes to your server.

Attention: Failure to follow these steps exactly could result in a lengthy recovery process.

For partition-sensitive fixes you should follow these steps exactly:

1. Permanently apply any fixes superseded by the new fixes.
2. Perform an initial program load (IPL) of all partitions from source A.
3. Load the fixes on all logical partitions with the Load PTF (LODPTF) command. Do not use the GO PTF command.
4. Apply the fixes temporarily on all logical partitions with the Apply PTF (APYPTF) command.
5. Power down all secondary partitions.
6. Perform a power down and IPL of the primary partition from source B in normal mode.
7. Perform normal mode IPLs of all secondary partitions from source B.
8. Apply all of the fixes permanently with the APYPTF command.

If you want information on advanced install topics, see applying PTFs or loading PTFs.

Your next step

To find information about the next steps for installing fixes on your servers, refer to the Install fixes topic.

Install fixes from an image catalog: This topic discusses how you can use an image catalog to install PTFs that you receive on media. When you use an image catalog, you can pre-load all your media so you do not have to handle the physical media when you install the PTFs. You pre-load the media when you copy the image from the physical media to a file in the integrated file system. You can then use these pre-loaded images to install your PTFs by using GO PTF option 8.

An image catalog is an object on the system that can contain up to 64 optical images. Each catalog is associated with one user-specified integrated file system directory.

Note: You cannot install PTFs from an image catalog with Management Central, but you can use the Copy from Media function to copy PTFs from an image catalog associated with a virtual optical device.

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 have 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 or not 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. You can have only one virtual optical device active at a time.

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 pre-loaded images are loaded.

```
CRTIMGCLG IMGCLG(ptfcatalog) DIR(directory-name) CRTDIR(*YES) TEXT(text-description)
```

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

3. Add an image catalog entry

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)
```

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 or Install cumulative PTF package. 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 from all of the loaded images in the catalog.

See Prepare to install an image catalog if you are planning to do a software upgrade.

Step 4: Verify fix installation

You should develop the habit of verifying whether or not 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 whether or not the IPL was normal.

OS/400 fix and licensed program activity does not occur during an unattended IPL (initial program load) that immediately follows an abnormal system end. If you did not specify **Y** for Perform Automatic IPL on the Install Options for PTFs display, you should 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, and Licensed Internal Code fixes were ready to be applied, the Licensed Internal Code fixes will not be applied. To apply the fixes after an abnormal IPL to storage area B, type:

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

4. Look for any messages that indicate that there was a failure during the IPL. 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 **GO 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 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.

Your next step

For other information about installing fixes on your servers, refer to the Install fixes topic.

Advanced fix installation procedures

This topic introduces the advanced topics of loading and applying PTFs and creating your own fix package. In general, you should 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 create your own fix package.

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.

Load fixes

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

Apply fixes

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

Build a custom fix package: 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.

The order of a cumulative PTF package is:

- High-impact pervasive (HIPER) Licensed Internal Code fixes
- HIPER OS/400 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 OS/400 fixes
- OS/400 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:

- QMF00500: *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                               |
|                                                                                   |
| Product . . . . . : 5722SS1                               System:  SYSNAMXX       |
|                                                                                   |
| Type option, press Enter.                                                         |
| 1=Select                                                                           |
|                                                                                   |
|      Opt  Release  Feature  National  Path  Hiper |
|      Opt  Release  Type     Language  Identifier  PTFs  |
|      Opt  Release  Type     Version   Identifier  PTFs  |
|-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1  V5R2M0  *CODE  2924  1  Yes |
| 2  V5R2M0  *CODE  2924  2  No  |
| 3  V5R2M0  *LNG   2924  2  No  |
|-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+

```

2. 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)

```

3. Copy the product delimiter into a save file.

```

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

```

4. 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 OS/400 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 OS/400 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.

To learn about other advanced install topics, see Advanced fix installation.

Advanced fix installation: Load fixes: 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 only send you the fix 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: 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 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 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 OS/400 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.
4. You must specify LICPGM(*ALL) and SELECT(*ALL) on the APYPTF command to ensure that fix dependency checking takes place for prerequisite Licensed Internal Code fixes. The fix with prerequisites knows about its prerequisites, but a prerequisite fix does not have any information about the fix that is dependent on it. Therefore, prerequisite checking must be done with the fix with the prerequisites is set for apply. When you use option 8 from the GO PTF menu to apply a fix with prerequisites, any Licensed Internal Code fixes that are called out as prerequisites are set for permanent apply. This information is important to remember. It is the action of setting the dependent for apply that sets the Licensed Internal Code fixes prerequisite for permanent 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:

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.

Temporarily or permanently installing licensed program or OS/400 fixes during an unattended IPL

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

Temporarily or permanently installing licensed program or OS/400 fixes during an attended IPL

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

Temporarily or permanently installing immediate licensed program or OS/400 fixes without an IPL

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

Applying Licensed Internal Code fixes at the next unattended IPL

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

Applying Licensed Internal Code fixes without an IPL

Find out how to apply Licensed Internal Code fixes without an IPL.

Cancel the application of fixes: 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 XXXXXXX is the licensed program and YYYYYYY is the number of the fix you want to omit.

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

To find more information on other ways to apply fixes, go to Advanced fix installation: Apply fixes.

Advanced fix installation: Applying 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:
`PWRDWNSYS *IMMED RESTART(*YES) IPLSRC(B)`
2. Press **Enter**.

Notes:

1. You must specify LICPGM(*ALL) and SELECT(*ALL) to ensure that fix dependency checking takes place for prerequisite Licensed Internal Code fixes.
2. If your system has logical partitioning, the Power pushbutton, DST option 7, or the Power Down System (PWRDWNSYS) command can affect multiple partitions. For details on using logical partitions on your iSeries server, go to Managing logical partitions.

For information on other ways to apply fixes, see Advanced fix installation: Applying fixes.

Advanced fix installation: Apply fixes during 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:
`PWRDWNSYS *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 Removing fixes.

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.

For information on other ways to apply fixes, see Advanced fix installation: Applying fixes.

Advanced fix installation: Applying 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 through 8 until the fixes are applied for all the selected licensed programs.

For information on other ways to apply fixes, see *Advanced fix installation: Applying fixes*.

Advanced fix installation: Apply 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**:

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

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, system reference codes (SRCs) C600 434B and C600 435B are displayed.

For information on other ways to apply fixes, see *Advanced fix installation: Applying fixes*.

Advanced fix installation: 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.

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:

```
PWRDWNSYS *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**.

Resetting IPL action: If you decide not to apply the fix on the next IPL, you can reset IPL action by using the following command:

```
APYPTF LICPGM(5722999) APY(*TEMP)  
DELAYED(*YES) IPLAPY(*NO)
```

For information on other ways to apply fixes, see Advanced fix installation: Applying fixes.

Display fixes information on your server

This topic tells you the different kinds of information that are available on the iSeries server that reflect the status and inventory of your fixes. To find out where to go to read about such things as special instructions or the latest Preventive Service Information, go to Where to find information about fixes.

View fix status descriptions in iSeries Navigator

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

View fix status descriptions with the character-based interface

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

Display properties of a fix or fix group

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

Display fix inventory

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

Display the level of fixes on your server

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

Display fix status with iSeries Navigator

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.

To display additional information about fixes on your server, see these topics:

Character-based interface status descriptions

View a table that contains the character-based interface status descriptions for your fixes.

iSeries Navigator status descriptions

View a table that contains the iSeries Navigator status descriptions for your fixes.

Display PTF information with the character-based interface

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 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.

Field	Description
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"> • If there has been a change in status since the Display PTF Status display is shown, the General information display shows the updated status. • 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. • If the system encountered an error while building the fix information file, the fix status is updated when the General information display is shown.
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 OS/400 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. Fixes are able to span multiple levels of a system.

For additional information about fixes on your server, see these topics:

Fix status descriptions in iSeries Navigators

View a table that contains the iSeries Navigator status descriptions for your fixes.

View fix status descriptions with the character-based interface

View a table that contains the character-based interface status descriptions for your fixes.

Display properties of a fix or fix group

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 Group (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

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 will be 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 (**Management Central** → **Endpoint Systems** → *any endpoint system* → **Configuration and Service** → **Fixes Inventory**) 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, you should collect the fixes inventory on a regular basis. You should also be aware that any tasks made from the fixes inventory list are not automatically reflected in the inventory.

Display level of 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.

Displaying the cumulative PTF package level

To display the cumulative PTF package level of your server or the level of Licensed Internal Code PTFs, do one of the following:

- For the cumulative PTF package level, 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.
- 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 2 Modification 0, and you have PTF TC02178 installed on your system, your cumulative fix package level is C2178520 (520 is added to the end of the package ID to indicate Version 5 Release 2 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.

Printing or displaying 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 *Displaying and printing fix cover letters*. A copy of the PTF summary is put into file QAPZCOVER in Library QGPL.

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. See a cover letter sample for an example of a cover letter. As part of the cleanup fixes task, you can delete old cover letters to save space on your system.

Order fix cover letters

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

Copy fix cover letters from media

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

Display and print fix cover letters

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

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 nnnnnnn 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.

For other tasks that relate to cover letters, see Work with fix cover letters.

Copy fix cover letters from media

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)
```

where 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)
```

where 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.

For other tasks that relate to cover letters, see *Work with fix cover letters*.

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.

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)

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

For other tasks that relate to cover letters, see *Work with fix cover letters*.

Clean up fixes

Over time, save files and cover letters for fixes tend to accumulate. After you have permanently installed a fix, you may 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.

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.

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.

For other tasks that relate to cover letters, see *Work with fix cover letters*.

Remove software fixes

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.

Notes:

- Before you remove a fix, be sure that the object affected by the immediate fix is not in use.
- Licensed Internal Code fixes can only be removed permanently.

This topic introduces the topics that provide the instructions for removing the following fixes:

Remove licensed program fixes

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

Remove OS/400 fixes

Find out how to remove one or more OS/400 fixes.

Remove Licensed Internal Code fixes

Find out how to remove Licensed Internal Code fixes.

Remove 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, type the character value of the licensed program (shown on the cover letter) 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. 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.

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

Remove OS/400 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

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

To uninstall fixes on a single system or on more than one system, go to the Management Central online help in iSeries Navigator. 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.

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

Remove Licensed Internal Code fixes

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

Immediate	Delayed
<p>To remove an immediate fix temporarily, type:</p> <pre>RMVPTF LICPGM(5722999) SELECT(MFxxxxx) RMV(*TEMP) RMVDEP(*YES)</pre> <p>where xxxxx is the fix identifier</p>	<p>To remove a delayed Licensed Internal Code fix permanently, do the following:</p> <p>1. Type:</p> <pre>RMVPTF LICPGM(5722999) SELECT(MFxxxxx) RMV(*PERM) DELAYED(*YES) RMVDEP(*YES)</pre> <p>where xxxxx is the Licensed Internal Code identifier.</p> <p>2. Type the following command and press Enter to do an IPL to the B side:</p> <pre>PWRDWSYS OPTION(*IMMED) RESTART(*YES) IPLSRC(B)</pre>

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

Work with software licenses and agreements

Use this information to learn how you and IBM 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 OS/400 software license management functions.

Software agreements and licensing concepts

The iSeries 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. Any program may be subject to the terms in a software agreement.

Plan for software licensing

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

Manage software licenses and agreements

You may be required to accept online software agreements to continue with the installation of non-IBM software products. 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

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 include both printed software agreements and online 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.

To find out more about licensing applications regarding logical partitions, see Software licensing and licensed programs for logical partitions.



Software agreements

IBM is in the process of moving many printed software license agreements to online software license agreements. For this release, however, the agreements for IBM licensed programs will continue to be in the same printed documents as in previous releases. Some software agreements for IBM or non-IBM products can be displayed or printed through the Work with Software Agreements (WRKSWAGR) command.

If you have non-IBM licensed programs to install on your server, you may be required to accept the terms of an online software agreement. If you accept the software agreement, you continue to install the program.

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 associate it with your product by using Management Central or software product APIs.



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. To find out more about licensing applications regarding logical partitions, see Software licensing and licensed programs for logical partitions.



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 your country's software key center contact. 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, which is part of the software license agreements.

Each keyed product or feature has its own key. You can add license keys by using the Work with License Information (WRKLICINF) command.



Plan for software licensing

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

Determine the usage limit for user-based priced products

Determine the number of licenses you should purchase based on the peak number of license users for a licensed-enabled packaged product.

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.



Determine the usage limit for user-based priced products

To determine the number of licenses you should purchase for the next release of a user-based priced product, 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

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, the processing capacity for all logical partitions where the product will be used must be summed. The processing capacity could be in fractional units. After totaling the processing capacities of the logical partitions, round the number up to the next largest whole number (the usage limit must be a whole number).



Manage software agreements and license keys

To maintain licensed programs appropriately on your server, consider the following tasks:

Accept software agreements

To continue to install certain non-IBM licensed programs, you could be required to accept a software agreement.

Display or print your software agreements

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

Display and change software license information

Add license key information and set the usage limit for user-based priced products.

Distribute software license keys

Distribute software license keys from one central site system to another system.



Accept software agreements

You could be required to accept a software agreement to continue with the installation of a non-IBM software product.

If you are a software provider who wants to present terms prior to the installation of your packaged software product, you may do so by generating a software agreement and then associate it with your product by using Management Central or software product APIs.



Display and change software license information

After you install your licensed-enabled packaged products, use the following functions from the Work with License Information (WRKLICINF) 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.

Set the usage limit for user-based priced products

After you complete a new installation and before you make the server available to all users, set the usage limit for IBM products that are not in the keyed set.



Add license key information: You can use the Work with License Information (**WRKLICINF**) command to add your license key information for your licensed-enabled packaged products. The WRKLICINF 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 **WRKLICINF** 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 (ADDLICKEY) 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 user-based priced (UBP) products. These UBP products are listed on the Proof of Entitlement (POE), invoice, or other document that you have received with your software order. For IBM UBP products, you set the usage limit with 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 license key information from one central site system to another target system. You do this by creating a file to automatically load the software license information to the other system during a software upgrade. Distributing software license information on distribution media describes how to create a license information file.



Manage software inventory

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

Examples

Here are a few examples of 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.
- 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.

In addition to managing the daily software 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.

With iSeries Navigator, you can also 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.

For more information about specific specific tasks, see the following topics:

Display an inventory of fixes

Find out how to manage your fixes inventory using iSeries Navigator wizards.

Work with inventories

Use Management Central inventory functions to collect and manage various inventories on a regular basis and store the data on the iSeries server you have selected as your central system.

Manage software products

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 OS/400 objects when you distribute packages for other systems to use.

Use the following information to help you effectively manage your installed software products:

Package and send non-IBM 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. Find out how to create and distribute your own products.

Generate fixes for installed products

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

Generate software agreements for non-IBM products

To present license terms prior to the installation of a non-IBM software product, you generate a software agreement and then associate it with your packaged product by using Management Central or software product APIs. Users then accept the software agreement to continue with the installation of the software product.

Send IBM products

Use iSeries Navigator to manage your IBM products. Find out how to send and install supported products.

For other topics relevant to software management, be sure to see the Software and licensed programs topic in the Information Center.

Package and send non-IBM software products

Product packaging enables you to make your application programs into a packaged product that is installed and maintained in the same manner as the IBM licensed programs. Once your application has been packaged as a product, you can manage all of the objects for that application as a single entity. We have several methods available that allow you to package your own products:

- Management Central product and package function
- System Manager licensed program
- Software Product APIs

Package a product with Management Central

One of the advantages to packaging your application with Management Central is that it is part of the OS/400 operating system; and therefore, involves no additional cost. With Management Central, you can distribute your applications and fixes in the same way that you distribute iSeries licensed programs. You can track your fixes the same way as you track IBM fixes. A product definition contains all the information that you need to send and install a product across multiple systems.

You need to create a product definition before you can package, or convert, your application into a product that your server recognizes as a product. The source system on which you create the product definition is used to manage the product. To package and distribute a product, do the following:

1. Create a product definition by following these steps:
 - a. In iSeries Navigator, expand **Management Central**.
 - b. Expand **Definitions**.
 - c. Right-click **Product** and select **New Definition**.
 - d. Follow the wizard's instructions for creating a new product definition. The source system on which you create the Management Central product definition is used to manage the product.
As part of the wizard, you can indicate that you want to prompt users to accept a license agreement when the product is installed. Add the license documents from the Add License Documents dialog. For information on how to create these license documents, see Generate online software agreements.
2. Install the product on the source system.
3. Send and install the product on other systems by following these steps:
 - a. In iSeries Navigator, expand **Management Central**.
 - b. Expand **Definitions**.
 - c. Select **Product**.
 - d. Right-click the product definition that you want to send to and install on a target system and select **Send and Install**.
 - e. Follow the wizard's instructions for installing the product definition on a target system. Clicking **Finish** causes the product to be sent and installed on the target system, and the status changes from **Installed** to **Managed**.

Notes:

- Only product definitions that have a status of **Installed** or **Managed** can be sent and installed.
- Only fixes that have been applied are sent when you send and install a product.

Because the product is installed on the source system, the product is available to be managed. A status of **Managed** means that the definition can no longer be changed. To make any changes to the product for the current release requires that you generate a fix.

After you have installed the product on the source system, you can generate fixes to that product.

Generate fixes for installed products using Management Central

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.

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 exit programs.

Generate software agreements for non-IBM products

iSeries independent software providers can create online software license agreements. A user then would be 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 MyProdIDVRM0ptDoc1 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, MyProdIDVRM0ptDoc1_en for an English version of the agreement, and MyProdIDVRM0ptDoc1_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 MyProdIDVRM0ptDoc1 directory, do the following:

1. Select Option 2 (Edit) against your MyProdIDVRM0ptDoc1 directory.
2. Under the new file prompt, type MyProdIDVRM0ptDoc1_en for the file name and press Enter to edit.
3. Before entering text, select PF15 (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. Select PF3 to edit your agreement. Make sure that no characters go past column 76 (either single wide or double wide).
7. Select PF2 to save and then select PF3 to exit.

For information on including these agreements when you build your product, see Package and send non-IBM software.

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

Send IBM software products

Sometimes it is desirable to duplicate some or all of a system's programs, including the operating system, onto another system. To do this with a minimum of effort and maximum benefits you should do some planning and consider the options available for distributing software products. Instructions for performing this task is in the Using central site distribution to install multiple iSeries servers topic. You can also use iSeries Navigator to send and install supported products.

To send and install IBM products, do the following:

1. Open **Management Central** from your **iSeries Navigator** window.
2. Expand **System Groups** or **Endpoint Systems**.
3. Expand **Configuration and Service**.
4. Expand **Software Inventory**.

5. Select either **Installed Products** or **Supported Products**.
6. From the right pane, right-click the product you want to send and install, and select **Send and Install**.
7. Follow the wizard's instructions for sending and installing the product.

If you want to manage non-IBM products, see the Manage software products topic.

Related information

Listed below are the iSeries information sources, IBM Redbooks^(TM) (in PDF format), Web sites, and Information Center topics that relate to the Maintain and manage software topic.

Websites

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

- iSeries and AS/400 Service



The IBM Service Support website 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.

Redbooks

You can view the following Redbooks from the International Technical Support Organization (ITSO)



to find out more information about Management Central.

- Managing AS/400 V4R4 with Operations Navigator



(about 500 pages)

Operations Navigator brings a Windows-like graphical interface to configuring, monitoring, and managing the OS/400 environment. This book gives you insight into the wide range of AS/400 functions available through the AS/400 iSeries Navigator graphical interface that comes packaged with AS/400 Client Access Express for Windows V4R4M0. It provides you with a moderate level overview of the AS/400 Operations Navigator's interface and functionality, correlates Operations Navigator functions with corresponding OS/400 command functions, and, in many cases, gives tips on how to use these functions. This publication is intended to help two sets of AS/400 users who have some level of management responsibilities for an AS/400 system: those familiar with the OS/400 command level interface to system facilities and those new to the OS/400, but who are familiar with Windows-like graphical interfaces to system facilities. Though Operations Navigator changed its name to iSeries Navigator at V5R2, the V4R4-level information in this Redbook is still a valuable overview of Management Central function.

- Management Central: A Smart Way to Manage AS/400 Systems



(about 240 pages)

Discover the benefits of Management Central and more. Management Central is a key component of

Operations Navigator that provides AS/400 administrators with the ability to manage multiple AS/400 systems that are interconnected across a TCP/IP network. It provides several constructs, which help to manage groups of systems and their associated resources. This redbook discusses the capabilities of each of the functions that are available in V4R4, and introduces you to the graphical user interface way of managing the systems in your network. Find out how easy it is to manage your network with the click of a mouse!

- IBM eserver iSeries Universal Connection for Electronic Support and Services



(about 220 pages)

Universal Connection offers dial-up support over TCP/IP through AT&T Global Network Services. It supports an Internet connection using a virtual private network (VPN) for more secure connections over the Internet. This Redbook explains how to use the support tools that report inventories of software and hardware on your machine to IBM so you can get personalized electronic support, based on your system data.

The Redbooks shown here are presented in PDF format. 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...**
3. Navigate to the directory in which you would like to save the PDF.
4. Click **Save**.

Other information

There are other related topics that contain information about managing your software. These include:

- **Basic system operations**

This topic introduces some of the key concepts and tasks required for iSeries basic operations. Specifically you will want to learn about configuring for the Universal Connection.

- **Logical partitions**

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**

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.

- **Software installation**

Use the information in this topic to successfully plan for and complete an installation of the OS/400 release on your server. This topic also contains information to help you install software other than the OS/400 release on your iSeries system.

If 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)





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