iSeries

Memorandum to Users

Version 5 Release 2 (June 2006 Update)

iSeries

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Note

Before using this information and the products it supports, be sure to read the information in "Notices" on page 55.

Fourth Edition (May 2004)

This edition applies to version 5, release 2, modification 0 of the IBM Operating System/400 (Program 5722-SS1) and iSeries licensed programs. This version does not run on all reduced instruction set computer (RISC) models nor does it run on CISC models.

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About iSeries Memorandum to Users

This information describes the changes in version 5 release 2 modification 0 (V5R2M0 or V5R2) that could affect your programs or system operations. Use the information in this memorandum to prepare for changes on your current release and to use the new release.

Who should read this memorandum

The Memorandum to Users contains information that is critical for several audiences. This memorandum has four chapters:

- **Read this first** provides information that should be considered prior to installing V5R2. This chapter is intended for system and application programmers and for the person responsible for system management.
- **OS/400® operating system** contains new release changes to basic operating system functions. This chapter includes changes to systems management functions, such as configuration and tailoring the system, as well as changes that could affect the way things operate or appear in the new release. This chapter is intended for all users of the iSeries™ servers.
- **Options** provides information about new release changes that affect specific program options of OS/400. This chapter is intended for all users of the iSeries servers.
- **Licensed programs** contains new release changes that may affect existing applications. These changes may also affect applications saved on a V5R2 server to be restored on a previous release server. This chapter is intended for application programmers and system programmers who use the iSeries server and its licensed programs, as well as for businesses with complex networks or application development businesses that have systems at different releases.

Additional incompatibility information

After the publication of the Memorandum to Users, updates to this document will be available in the English Internet version of the iSeries Information Center at this Web site:

`www.ibm.com/eserver/iseries/infocenter`

Technical changes to the text are indicated by a vertical line to the left of the change.

For other incompatibility information that was not available when this memorandum was published, see PTF cover letters, preventive service planning (PSP), and authorized problem analysis reports (APAR) information at the following Web site:

`www.ibm.com/eserver/iseries/support`

Click **SEARCH Technical Databases**.

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What's new

The following revisions or additions have been made to the Memorandum to Users since the first V5R2 publication:

- **June 2006 update:**
  - "PTF adds additional error checking to the restore function" on page 35 was added.
- **May 2006 update:** "Support for I/O expansion units" on page 6 was modified.
- **May 2004 update:**
  - "Output file changes" on page 7 was revised.
  - "Installation time for BRMS" on page 45 was revised.
  - "Default DDM server jobs moving to QUSRWRK subsystem" on page 27 was revised.
  - "Access path not saved when physical file has no records" on page 34 was added.
  - "Start Performance Trace (STRPFRTRC) and Trace Internal (TRCINT) commands" on page 16 was added.
- **July 2003 update:**
  - "Memory requirements for installation of V5R2" on page 8 was revised.
  - "CHAR function inconsistencies with packed decimal fields" on page 18 was added.
  - "Before you restore the QUSRSYS library following V5R2 upgrade and migration" on page 34 was added.
  - "Batch Journal Caching PRPQ P84486 (5799-BJC) and HA Journal Performance (Option 42)" on page 43 was added.
  - In chapter 4, "Infoprint Server for iSeries (5722-IP1)" was removed.
  - "Installation time for BRMS" on page 45 was revised.
  - "Proxy serving on HTTP Server" on page 50 was revised.
- **January 2003 update:**
  - "Current customers only — before you install V5R2" on page 1 was revised.
  - "V5R2 installation requirements" on page 2 was revised.
  - "Plan for your Operations Console installation or upgrade" on page 4 was revised.
  - "OS/400 pricing and terms changed for 800, 810, 825, 870, and 890 models" on page 5 was added.
  - "I/O software prerequisites" on page 6 was added.
  - "Support for I/O expansion units" on page 6 was added.
  - "Workstation gateway option removed" on page 33 was revised.
  - "Performance Tools for iSeries (5722-PT1)" on page 47 was revised.
- **October 2002 update:**
  - "V5R2 installation requirements" on page 2 was revised.
  - "Plan for your Operations Console installation or upgrade" on page 4 was revised.
  - "Missing Telnet exit program entries" on page 3 was added.
  - "Memory requirements for installation of V5R2" on page 8 was revised.
  - "DDM and DRDA connection limitations" on page 34 was added.
  - "iSeries supported products for V5R2" on page 45 was added.

– "XML-enabled columns must be migrated" on page 49 was revised.

Installing V5R2 over V4R5

Be sure to read the *iSeries Read This First and Memorandum to Users* for V5R1. This document contains incompatibility-related information about the new functions and enhancements incorporated into V5R1. You can order this document by typing the following command:

```
SNDPTFORD SF98066
```

It is also available in the PSP information at this Web site:

www.ibm.com/eserver/iseries/support

Discontinued support for certain software and hardware

It is important that you as a customer review and understand all new software release considerations. This is especially true of discontinued support for selected software and hardware products or features. This information is contained within the iSeries announcement material. To get the most current information on discontinued products or features along with suggested replacements, go to the iSeries Planning Web site:

www.ibm.com/servers/eserver/iseries/support/planning/

Select the link for upgrade planning information.

Installation considerations

Information about the installation and installation-related tasks is included in the book *Software Installation*. Information regarding planning and preparing for software installation along with licensed program conceptual and reference information can be found in the iSeries Information Center at:

www.ibm.com/eserver/iseries/infocenter

Click **Installation, upgrades, and migration** –> **Install the OS/400 release and related software**.

PTF numbers in this memorandum

Program temporary fix (PTF) numbers in this memorandum might have been superseded.

Memorandums for previous releases

In addition to ordering previous releases of the *Read this First* and the *Memorandum to Users* using the SNDPTFORD command, you can also view these documents at the following Web site:

www.ibm.com/eserver/iseries/support

Under **Find it Fast!**, click **SEARCH Technical Databases –> Preventive Service Planning Information (PSP) –> All Preventive Service Planning Documents by Release**.

Prerequisite and related information

Use the iSeries Information Center as your starting point for looking up iSeries technical information.

You can access the Information Center two ways:

- From the following Web site:

  `http://www.ibm.com/eserver/iseries/infocenter`
- From CD-ROMs that ship with your Operating System/400 order:

  iSeries Information Center, SK3T-4091-02. This package also includes the PDF versions of iSeries manuals, *iSeries Information Center: Supplemental Manuals*, SK3T-4092-01, which replaces the Softcopy Library CD-ROM.

The iSeries Information Center contains advisors and important topics such as Java™, TCP/IP, Web serving, secured networks, logical partitions, clustering, CL commands, and system application programming interfaces (APIs). It also includes links to related IBM® Redbooks™ and Internet links to other IBM Web sites such as the IBM home page.

With every new hardware order, you receive the *iSeries Setup and Operations CD-ROM*, SK3T-4098-01. This CD-ROM contains IBM **@server** iSeries Access for Windows and the EZ-Setup wizard. iSeries Access offers a powerful set of client and server capabilities for connecting PCs to iSeries servers. The EZ-Setup wizard automates many of the iSeries setup tasks.

iSeries Navigator

IBM iSeries Navigator is a powerful graphical interface for managing your iSeries servers. iSeries Navigator functionality includes system navigation, configuration, planning capabilities, and online help to guide you through your tasks. iSeries Navigator makes operation and administration of the server easier and more productive and is the only user interface to the new, advanced features of the OS/400 operating system. It also includes Management Central for managing multiple servers from a central system.

You can find more information on iSeries Navigator in the iSeries Information Center and at the following Web site:

`http://www.ibm.com/eserver/iseries/navigator/`

How to send your comments

Your feedback is important in helping to provide the most accurate and high-quality information. If you have any comments about this memorandum or any other iSeries documentation, fill out the readers' comment form at the back of this memorandum.

- If you prefer to send comments by mail, use the readers' comment form with the address that is printed on the back. If you are mailing a readers' comment form from a country other than the United States, you can give the form to the local IBM branch office or IBM representative for postage-paid mailing.
- If you prefer to send comments by FAX, use either of the following numbers:
  - United States, Canada, and Puerto Rico: 1-800-937-3430

  - Other countries: 1-507-253-5192
- If you prefer to send comments electronically, use one of these e-mail addresses:
  - Comments on books:

    RCHCLERK@us.ibm.com
  - Comments on the iSeries Information Center:

    RCHINFOC@us.ibm.com

Be sure to include the following:

- The name of the book or iSeries Information Center topic.
- The publication number of a book.
- The page number or topic of a book to which your comment applies.

Chapter 1. Read this first

Current customers only — before you install V5R2

Each of the following publications contains additional information you should read and understand before you install this release. All of the sources referenced in this list are located either on the *iSeries Information Center*, SK3T-4091-02, CD-ROM or on the Internet at the following Web site:

`www.ibm.com/eserver/iseries/infocenter`

Note: After the release of the Information Center, updates will be available in the English Internet version. To review these updates, click **Updates since V5R2 announcement** on the Information Center home page.

Access the Internet version or place the CD in the CD-ROM drive of your PC to view its contents. The instructions refer you to several sources:

- The iSeries Information Center Installation, upgrades, and migration category contains preinstallation information that includes conceptual and reference information, globalization, physical planning for new systems, and planning for logical partitions.
- The *Software Installation*, SC41-5120-06, book contains the task-oriented instructions to install licensed programs for the new release.
- The Preventative Service Planning (PSP) Information provides information about software problems you may encounter as you install the new release. You can download PSP by using electronic customer support from the IBM @server iSeries Support Web site:

  `www.ibm.com/eserver/iseries/support`

  Alternatively, you can obtain PSP from your software service provider. The following items are included in PSP:

  – The PSP identifier for information that pertains to installing V5R2 is SF98070. Information within the PSP is grouped by product area. To receive this PSP information by using electronic customer support, type the following command on an iSeries command line:

  ```
  SNDPTFORD SF98070
  ```

  – The PSP identifier for information that pertains to problems discovered since the availability of the current cumulative PTF package is SF98520. Information within this PSP describes all PTFs released since the current cumulative PTF package began shipping. It also contains information on all known high-impact and pervasive problems that are not included in the latest cumulative PTF package. To receive this PSP information by using electronic customer support, type this command on an iSeries command line:

  ```
  SNDPTFORD SF98520
  ```

  – The PSP identifier for information that pertains to installing V5R2 hardware is MF98520. Review this PSP information before you install either new iSeries servers or hardware devices. To receive this PSP information by using electronic customer support, use this command:

  ```
  SNDPTFORD MF98520
  ```

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– The PSP identifier for information that pertains to server upgrades and data migrations is SF98166. Information within this PSP describes known high-impact and pervasive problems. Review this PSP information before you upgrade your server model or migrate your data between servers. To receive this PSP information by using electronic customer support, type the following command on an iSeries command line:

```
SNDPTFORD SF98166
```

- The iSeries PTF maintenance strategy. A PTF maintenance strategy is recommended for all iSeries customers. This may reduce the impact to iSeries system operations that result from unplanned outages or program failures. For more information on the iSeries maintenance strategy, do the following:
  1. Go to: `www.ibm.com/eserver/iseries/support`.
  2. Under **Find it Fast!**, click **Internet PTF Downloads (iPTF)**.
- The iSeries Operations Console overview **(Connecting to iSeries —> What to connect with —> Operations Console)**. If you are using the Supplemental Manuals CD-ROM, change to the Information Center CD-ROM, then click the link.

Notice

Operations Console support is available on V4R5 and later releases of the OS/400 operating system. In V5R2, the only type of PC console that iSeries Models 270, 800, 810, 820, 825, 830, 840, 870, and 890 support is Operations Console.

V5R2 installation requirements

Successful installation of OS/400 V5R2 requires the following for each server or logical partition:

- A load-source disk unit of 2 gigabytes or larger must be installed. Server Models 840, 870, and 890 require at least 2.5 gigabytes. If you are using an image catalog to install, the load-source disk unit must be 4 gigabytes. This unit is disk unit number 1 in auxiliary storage pool (ASP) number 1.
- A minimum memory size of 128 megabytes. Systems with less than this minimum memory fail the installation process for Licensed Internal Code. Memory requirements for partitions are dependent on partition configuration, I/O resources assigned, and applications used. The primary partition needs a minimum of 256 megabytes of memory. Depending on configuration values used, a primary partition may require more than 256 megabytes. Secondary partitions running V4R4 and V4R5 require a minimum value of 64 megabytes. Secondary partitions running V5R1 and V5R2 require a minimum of 128 megabytes of memory. Also depending on configuration values used, a secondary partition may require more than 128 megabytes. For more information on memory requirements for logical partitions, see the Logical partition concept: memory topic in the iSeries Information Center.
- Some products have specific requirements of their own. Review all product requirement information that you receive with your order.

You must install the appropriate V5R2 level of OS/400 on your server and partitions if you are migrating to an 800, 810, 825, 870, or 890 model. For more information on the software required for these models, see Information APAR II13365 at the IBM @server iSeries Support Web site:

www.ibm.com/eserver/iseries/support

Click **SEARCH Technical Databases** –> **Authorized Problem Analysis Reports APARS**.

More information on partition release requirements for all iSeries models is in the Logical partition release support topic in the iSeries Information Center.

Process for ordering cumulative PTF packages is changing

You might not receive a cumulative PTF package with your software order depending on how and when you placed the order. The process for getting the cumulative PTF package is changing. To ensure consistent cumulative PTF packaging and to be able to get the latest PTFs, IBM is establishing a single delivery source. This single source is Corrective Service.

Now when you order the Cumulative PTF Package for V5R1 (SF99510) or V5R2 (SF99520) from Corrective Service, you will receive the latest cumulative PTF plus DB (Database) Group PTFs and HIPER (High Impact Pervasive) Group PTFs to install with your software upgrade. The cumulative PTF package that in the past may have been delivered with your software order did not include the HIPER or Database Group PTFs.

If an extended time has elapsed since you received your order, a later cumulative PTF package might be available. You can order cumulative PTF packages either by using the SNDPTFORD command, by using the iPTF application, or by contacting your software service provider. You are advised to check to see if you have the latest cumulative PTF package. To view the latest available cumulative PTF package identifier for your OS/400 software release, go to the IBM @server iSeries Support Web site:

www.ibm.com/eserver/iseries/support

Click **SEARCH Technical Databases** –> **Preventative Service Planning - PSP**.

Refer to the software installation preventative service planning (PSP) document for the release of OS/400 software that you are installing (SF98070 for Release R520 and SF98060 for Release R510).

If you do not have the latest cumulative PTF package for your OS/400 software installation, place an order for the package 7 to 10 working days before you plan to install the OS/400 software to allow sufficient delivery time. You can view PTF ordering options through the Internet at Web site shown in the previous paragraph. Click **SEARCH Technical Databases** –> **PTF Ordering**.

Missing Telnet exit program entries

During the installation of the OS/400 operating system, any exit program entries that were added for exit points QIBM_QTG_DEVINIT (format INIT0100) and QIBM_QTG_DEVTERM (format TERM0100) will be inadvertently removed. Each exit point allows for a maximum of one exit program entry to be added. If you previously added exit program entries to these exit points, you will need to add these again once the installation completes. To add the exit program entries, you can use either the Work with Registration Information (WRKREGINF) command (specify option 8, then option 1 for the exit point), the Add Exit Program (ADDEXITPGM) command, or the QUSADDEP/QusAddExitProgram API.

Client Access Async Console not supported

Client Access Async Console is not supported in V5R2. In terms of cabling, the Client Access Async Console is similar to the Operations Console direct cable connection. You must order a new connectivity cable if you choose to use Operations Console through a direct cable attachment. If you choose to use LAN connectivity, you must use a standard LAN cable to attach the Operations Console PC workstation.

See Meet Operations Console hardware requirements in the iSeries Information Center to determine which hardware features you need.

Plan for your Operations Console installation or upgrade

If you are upgrading to V5R2 and you want to replace an existing console with Operations Console, upgrade the system before migrating the console. This will prevent any conflict between the existing console and the Operations Console. For instructions on upgrading your OS/400, see the Upgrades topic and Install the OS/400 release and related software topic.

Prerequisite information for Operations Console users upgrading to, or installing, V5R2:
You must comply with the following before upgrading or installing your software (OS/400, Licensed Internal Code) to V5R2:

1. If you use the Operations Console configuration, `Local console directly attached to the server`, the adapter used for the cable connection must be in a specific location. The adapter can be a 2742, 2745, 2771, or 2793. The location is based on the server model shown in the following table:

Table 1. Card location

iSeries model	Operations Console asynchronous card location for the cable
170 or 250	C08
270	C07
620, S20, 600, or S10	C09
720	C09
800	C07
810	C07
820	C06
825	C06
830 or SB2	C02
840 or SB3	C02
870 or 890	C02

2. For all upgrades and installations, you need to establish a connection between the iSeries server and Operations Console PC using the service tools user ID of 11111111 (eight 1's). This will ensure a successful re-authentication of the client connection to the server. When you receive the OS/400 release upgrade, the shipped service tools user IDs (except 11111111) are expired. To establish a successful re-authentication of the client connection to the server, enter the service tools user ID of 11111111 (eight 1's). This is especially important for automatic installations.

3. It is recommended that you update iSeries Access for Windows® to V5R2 before you upgrade the OS/400 operating system. For more information, see the Install iSeries Access for Windows topic.

Note: Failure to comply with the above actions may prevent the console from working correctly during the upgrade or installation.

New integrated Ethernet port on Model 825

New with the iSeries Model 825 is an integrated Ethernet port. If you select the LAN connectivity option of Operations Console, this port will be the only LAN port to which Operations Console will connect. Other LAN adapters on the server will not be available for Operations Console function unless there is a complete hardware failure on the integrated Ethernet port. As with other LAN adapters, if it is used for Operations Console, it must be dedicated for that use.

If you are using Operations Console LAN connectivity today and migrating to the Model 825l, make sure that your console connects to the integrated Ethernet port.

Migrating to Operations Console before your server model upgrade

If you are going to be utilizing Operations Console on your new iSeries server (migrating from a different console type), it is important that you configure the new Operations Console PC before the beginning of the server model upgrade. At the point in the upgrade instructions where console functions are required on the new iSeries server, you will be able to perform any required functions without the need for your current console device. The Operations Console features matching the connectivity you plan to use should be specified as part of the order for your new iSeries server.

4xx and 5xx models do not support V5R2 Licensed Internal Code

Server models 4xx and models 5xx do not support Licensed Internal Code for the V5R2 release. The installation of V5R2 Licensed Internal Code will not be allowed if it is attempted on server models 4xx or 5xx.

OS/400 pricing and terms changed for 800, 810, 825, 870, and 890 models

A different approach to OS/400 licensing is being implemented to better reflect the changing characteristics of the iSeries server and the environments it supports. There are now separate prices for the processor activation and for an additional OS/400 processor license. The OS/400 license charge applies only when OS/400 will be used on the processor that is being activated. It may not apply to processor activations that are being used only for Linux.

After you complete the installation process for the above models and before you make any server or partition available to all users, you need to update the usage limit for OS/400 on that server or partition. You use the Work with License Information (WRKLICINF) command to do this. This task is in the final checklist for completing the installation (Chapter 11) of *Software Installation*, SC41-5120-06. For these models (800, 810, 825, 870, and certain 890 models), the usage limit for every server or partition running OS/400 must be entered in the option field for

5722SS1 feature 5051. The WRKLICINF command displays feature 5051 only on the hardware models listed above. The usage limit that you enter is included in your Proof of Entitlement (POE) or invoice.

The requirement for adding a license key for 5722SS1 feature 5050 has not changed. All hardware models require a license key for feature 5050.

For more information, refer to Information APAR II13365 at the IBM @server iSeries Support Web site:

www.ibm.com/eserver/iseries/support

Click **SEARCH Technical Databases** –> **Authorized Problem Analysis Reports APARS**.

Information is also available at the iSeries Planning Web site:

www.ibm.com/servers/eserver/iseries/support/planning/nav.html

I/O software prerequisites

For the latest information on software prerequisites for new I/O features and new I/O expansion units that are available, see Information APAR II13440 at the IBM @server iSeries Support Web site:

www.ibm.com/eserver/iseries/support

Click **SEARCH Technical Databases** –> **Authorized Problem Analysis Reports APARS**.

Support for I/O expansion units

iSeries models announced in January 2003 (800, 810, 825, 870, and 890 models) support PCI-attached I/O expansion units rather than SPD-attached features. More information on current support for I/O features is available at the following Web address:

http://www.ibm.com/servers/eserver/support/iseries/planning/upgrade/v5r2/hardware.html

Chapter 2. OS/400 operating system

This chapter describes changes to the OS/400 operating system and its functions. Changes to systems management functions, such as configuring and tailoring the system, are also included.

Programming considerations

Output file changes

Applications using LVLCHK(*YES) may be affected by changes made to IBM-shipped system output files in this release. IBM commands and APIs that generate database output files added new fields to the end of record formats for additional information returned this release. Adding these new fields to the record format changed the level check value for the file. This might cause an application with LVLCHK(*YES) to fail with a level check error. If a level check error does occur, please review the application to determine which system file it uses. New fields have been added to IBM-shipped database files in each release of AS/400® and iSeries.

Security audit record changes

Changes made to security auditing for this release may affect applications that read those audit records. Actions that were not audited in previous releases may now be audited. Existing audit records may have been changed by the addition of new fields in a reserved area of the audit record or at the end of the audit record. Existing fields may contain new values. Applications that read the audit records should be changed to tolerate these types of changes.

Programs that use customized versions of IBM-supplied commands

Some OS/400 functions that use IBM-supplied CL commands that are not library-qualified in V5R2 may be changed in a future release to specify a specific library, *NLVLIBL or *SYSTEM, for the library qualifier. Applications that depend on using their own version of commands instead of the IBM-supplied commands might not work as they had on earlier releases. These applications should be changed to use the retrieve command exit point (QIBM_QCA_RTV_COMMAND) or the change command exit point (QIBM_QCA_CHG_COMMAND) command that allow your exit program to get control and possibly change the command that is used.

Load-source disk unit requirements

OS/400 V5R2 requires that a load-source disk unit of 2 gigabytes or larger be installed on the iSeries server. Server Models 840, 870, and 890 require 2.5 gigabytes to support V5R2. If you are using an image catalog to install, the load-source disk unit must be 4 gigabytes. This unit is disk unit number 1 in auxiliary storage pool (ASP) number 1.

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If an iSeries server does not currently have the required gigabytes, you must save nonsystem data, then replace the existing load-source disk unit with a unit of 2 gigabytes or larger. When you have installed the load-source disk, install V5R2 and restore all nonsystem data.

To successfully install V5R2 on a system with logical partitions, each logical partition requires a load-source disk unit that is 2 gigabytes or larger.

For specific licensed program sizes available for V5R2, see the **Licensed program releases and sizes** topic in the iSeries Information Center. Also be sure to review all product requirement information that you receive with your order.

Memory requirements for installation of V5R2

Successful installation of V5R2 requires a minimum memory size of 128 megabytes for servers and secondary partitions. Servers with less than this minimum memory fail the installation process for Licensed Internal Code.

Memory requirements for partitions are dependent on partition configuration, I/O resources assigned, and applications used. The primary partition needs a minimum of 256 megabytes of memory.

Depending on the number of secondary partitions you plan to create, the primary partition's memory requirements may increase. If you have allocated minimum memory resources to your primary partition for its maximum memory configuration, you must add 8 megabytes of memory to the minimum memory size of the primary partition before you create secondary partitions on your server.

During a hardware or software upgrade, you may receive system reference code (SRC) 1 B600 5390. This error indicates that you may need to increase the memory values for the primary partition or the secondary partition being upgraded. To increase memory values, reconfigure the partition's memory using iSeries Navigator.

Command and API changes

Add Commitment Resource (QTNADDCR) API

When the Add Commitment Resource (QTNADDCR) API is used to add a user-defined resource under commitment control, an exit program must always be specified and a journal may optionally be specified. If a journal is specified, the exit program is to receive the commit cycle identifier for the journal when it is called to commit or rollback. The commit cycle identifier is the journal entry sequence number of the C SC journal entry that marks the beginning of the commit cycle.

In V5R2, if the journal is in *STANDBY state when the commit or rollback operation occurs, a commit cycle identifier value of zero is passed because a commit cycle may not be started when the journal is in *STANDBY state. Prior to V5R2, the exit program always received a non-zero value. A new journal state of *STANDBY was added in V5R2. This new state is activated by the JRNSTATE parameter on the Change Journal (CHGJRN) command. This function is a chargeable feature of the OS/400 operating system (option 42 - HA Journal performance). If this feature is not installed, JRNSTATE(*STANDBY) is not allowed.

Change Job command and Change Job (QWTCHGJB) API

When using the Change Job (CHGJOB) command or the Change Job (QWTCHGJB) API, the authority required to change the output queue associated with the job has changed. The user who calls the command or the API must have *READ authority to both the output queue that is currently associated with the job and the new output queue. In addition, the user must have *EXECUTE authority to the libraries that contain the output queues.

CRTJRN and CRTJRNRCV commands

Prior to V5R2, the RCVSIZOPT parameter of the Create Journal (CRTJRN) command had a default value of *NONE. Starting in V5R2, the default value for the parameter is changed to a value of *MAXOPT1. Thus journal receivers that use this value cannot be saved and restored to any releases prior to V4R5 nor can they be replicated to any remote journals on any system at releases prior to V4R5. If you need journal receivers to go back to releases prior to V4R5, then you will need to change this RCVSIZOPT parameter to a value other than *MAXOPT1 or *MAXOPT2.

Before V5R2, the threshold parameter of the Create Journal Receiver (CRTJRNRCV) command had a range of 1 to 1,000,000,000 or *NONE. Now the range will be 100,000 to 1,000,000,000. The special value of *NONE is still valid. Any value specified that is less than 100,000 will be reset to 100,000 and an informational message will be sent stating this change.

PRTINTDTA and DMPJOB commands

In V5R2, the Print Internal Data (PRTINTDTA) command checks for different special authorities than it did in previous releases. The command checks for *SERVICE special authority or whether the user is authorized to the Service Dump function of Operating System/400® through iSeries Navigator's Application Administration support. The Change Function Usage Information (QSYCHFUI) API, with a function ID of QIBM_SERVICE_DUMP, can also be used to change the list of users that are allowed to perform dump operations.

The command must be issued from within the job with internal data being printed, or the issuer of the command must be running under a user profile which is the same as the job user identity of the job with internal data being printed, or the issuer of the command must be running under a user profile which has job control (*JOBCTL) special authority. The job user identity is the name of the user profile by which a job is known to other jobs. It is described in more detail in the *Work Management* book in the Supplemental Manuals topic of the iSeries Information Center.

The Dump Job (DMPJOB) command, when specified with parameters JOBARA(*NONE) and JOBTHD(*THDSTK), has been changed to only dump the thread stack of the selected threads. The additional information that used to be dumped when this combination of parameters was specified is no longer dumped.

Query (QQQQRY) API change

The record sampling (number of candidate records) field (qdbq#rcd) of the QDT structure that is passed to the QQQQRY API is no longer supported. Its value will be ignored and all records in the queried files will be processed.

Digital object signing support extended

When the QVFYOBJRST system value is set to anything other than 1, then *CMD objects that call system state programs must be signed in order to be restored. This means that you will be unable to restore these *CMD objects from previous releases, since *CMD objects can be signed only starting in V5R2.

Many IBM-supplied commands call system state programs. One way to check for this is to run the Display Command (DSPCMD) command on the *CMD object to see if the **State used to call program** parameter specifies *SYSTEM or *USER. *SYSTEM means that this command must be signed to be restored. *USER means that you might be able to restore this command even if it is unsigned, provided the *CMD object does not call other system state programs. If the *CMD object calls other system state programs, even if it is identified as calling a user state program on the DSPCMD command, it must be signed in order to be restored.

If the QVFYOBJRST system value is 4 or 5 (which requires *CMD objects to be signed), then all *CMD objects from older releases will not restore since they are signable objects in V5R2 and have their signatures checked at restore time. This applies to all commands, and not just to those commands that call system state programs.

Virtual optical device

Message CPI0995 currently has a 1-character replacement data field for IPLSRC. Before V5R2, this field would only contain A, B, or D. After V5R2 it could contain * for *IMGCLG or *PANEL. A new larger field has been added to the message.

The default value for the Message queue parameter (MSGQ) on the Create Device Optical (CRTDEVOPT) command has changed. The default value of *LIBL/QSYSOPR is changed to *SYSOPR, which sets the default message queue to be QSYS/QSYSOPR.

WRKLIB and DSPOBJD OBJTYPE(*LIB) will include QTEMP

The WRKLIB command will now return the QTEMP library in the list of all libraries when WRKLIB LIB(*ALL) is specified. The DSPLIB command already returns the QTEMP library in the list of all libraries.

The DSPOBJD command will now return the QTEMP library in the list of all libraries when DSPOBJD OBJ(QSYS/*ALL) OBJTYPE(*LIB) or DSPOBJD OBJ(*LIBL/*ALL) OBJTYPE(*LIB) is specified.

IPARPLIL parameter removed from CRTPGM and CRTSRVPGM commands

In V5R2, the IPARPLIL (IPA replace intermediate language data) parameter has been removed from the Create Program (CRTPGM) and Create Service Program (CRTSRVPGM) CL commands. This parameter was new in V5R1, but V5R1 PTF SI01302 caused the IPARPLIL parameter to be ignored.

Message Split Size (MSGSPLIT) default changed

The default value for the Message split size (MSGSPLIT) parameter on the Change POP Server Attributes (CHGPOPA) command was changed to *NOMAX, which disables message splitting. Prior to V5R2, the default was 128 (kilobytes). *NOMAX has been the recommended value for several releases because not all mail clients are able to reassemble notes that have been split. This command change does not

affect POP mail servers on iSeries servers that upgrade to V5R2. To change an existing POP mail server to disable message splitting, run the CHGPOPA command and specify MSGSPLIT(*NOMAX).

ALCOBJ and DLCOBJ lock space scope

The Allocate Object (ALCOBJ) command and Deallocate Object (DLCOBJ) command have an additional SCOPE parameter value of *LCKSPC. The new parameter scopes locks to the lock space when a lock space is attached to the current thread. If no lock space is attached to the thread, the lock will be scoped to the job. A lock space is an internal system object that can own object and record locks, and can contain other internal system objects.

In V5R2, some products such as WebSphere® licensed programs use the new lock space support. If you have user exits for these products that use ALCOBJ and DLCOBJ and experience lock conflicts, you may need to change the SCOPE parameter to *LCKSPC.

In general, this change will not affect most existing applications. Only applications that use the XA and JTA APIs for transaction management have a potential to be impacted. The likelihood for a failure to occur would be if a stored procedure or trigger program attempted to use ALCOBJ on a database file and that file was already locked by a lock space.

Work management command and API authority changes

The Submit Job (SBMJOB) command now requires that the user profile specified on the User (USER) parameter have *USE authority to the libraries specified for the submitted job. Previously, the SBMJOB command required only *READ and *EXECUTE authority to the libraries. However, without *USE authority, the new job would fail to start.

The Work with Object Locks (WRKOBJLCK) command now requires that the user have *EXECUTE authority to the library containing the object, or that the user have *JOBCTL special authority.

The Display Object Locks (QSYS38/DSPOBJLCK) command in the S/38 environment now requires that the user have *EXECUTE authority to the library containing the object, or that the user have *JOBCTL special authority.

The List Object Locks (QWCLOBJL) API now requires that the user have *EXECUTE authority to the library containing the object, or that the user have *JOBCTL special authority.

QWCLOBJL in previous releases returned blanks for the thread ID field when a lock was scoped to a job. The API now returns zeros if a lock is not scoped to a thread.

The List Job Schedule Entries (QWCLSCDE) API now requires that the user have *EXECUTE authority rather than *READ authority to the job schedule library.

The List Subsystem Job Queues (QWDLSJBQ) API now requires that the user have *EXECUTE authority rather than *READ authority to the subsystem description library.

Obsolete parameters removed from Windows Network Server commands

The obsolete parameter Country code (CNTRYCODE) has been removed from the Create Network Server Description (CRTNWSD) command and the Change Network Server Description (CHGNWSD) command. This parameter was previously ignored when a server description was created.

The obsolete Drive letter (DRVLTR) parameter has been removed from the Add Server Storage Link (ADDNWSSTGL) command. Users of this command should use the Drive sequence number (DRVSEQNBR) parameter.

For the latest information about required PTFs for file server hardware migrations or support for the Windows .NET server versions, refer to the iSeries Integration for Windows Server Web page at this address:

`www.ibm.com/servers/eserver/iseries/windowsintegration`

Clustered hash table command changes

The following changes were made to the Clustered hash table function commands in V5R2:

- The WAITRSP parameter has been removed from the STRCHTSVR CL command.
- The STRCHTSVR CL command supports RSPTIMO only when the current cluster version is 2.
- The public authority on STRCHTSVR and ENDCHTSVR changed from PUBLIC(*USE) to PUBLIC(*EXCLUDE) in V5R2.

Cluster CL commands replace QUSRTOOL commands

In V5R2, CL commands for clustering functions are shipped in library QSYS as part of the OS/400 operating system. In V5R1, clustering CL commands and command processing programs had been shipped in library QUSRTOOL as part of OS/400 option 7, Example Tools Library. In a future release, the following commands will be removed from the QUSRTOOL library:

Add Cluster Node Entry
Add Cluster Resource Group Device Entry
Add Cluster Resource Group Node
Add Device Domain Entry
Change Cluster Node Entry
Change Cluster Version
Change Cluster Resource Group
Change Cluster Resource Group Device Entry
Change Cluster Resource Group Primary
Create Cluster
Create Cluster Resource Group
Delete Cluster
Delete Cluster Resource Group Active
End Cluster Node
End Cluster Resource Group
Print Cluster Information
Print Cluster Name
Print Cluster Resource Group Information
Print Cluster Resource Service Information
Print Device Domain Information
Remove Cluster Node Entry

Remove Cluster Resource Group Device Entry
Remove Cluster Resource Group Node
Remove Device Domain Entry
Start Cluster Node
Start Cluster Resource Group

If you are currently using the QUSRTOOL clustering commands, you should change your CL programs to use the clustering commands in QSYS.

Get Profile Handle and Get Profile Token APIs will change

Changes are being made to the Get Profile Handle and Get Profile Token APIs in a future release that may require source code changes to your applications. You can get ready for the changes now by following these rules:

Get Profile Handle (QSYGETPH) API
When specifying a password for the password parameter, the password length and CCSID parameters will be required. When specifying a special value for the password parameter, password length and CCSID parameters will not be allowed.

Get Profile Handle (QsyGetProfileHandle) API
Special values will not be allowed for the password parameter on this API. Use the QSYGETPH API instead.

Generate Profile Token (QSYGENPT) API
When specifying a password for the password parameter, the password length and CCSID parameters will be required. When specifying a special value for the password parameter, password length and CCSID parameters will not be allowed.

Generate Profile Token Extended(QsyGenPrfTknE) API
Special values will not be allowed for the password parameter on this API. Use the QsyGenPrfTkn API instead.

Generate Profile Token (QsyGenPrfTkn) API
Password values will not be allowed for the password parameter on this API. Use the QsyGenPrfTknE API instead.

Save and restore command changes

In V5R2, the Restore Authorities (RSTAUT) command will send completion message CPC3710 if it does not find any authorities to restore for the specified users. Previously, it sent escape message CPF3776 if any of the specified users did not have any authorities to be restored.

Previously, the Save Library (SAVLIB), Save Object (SAVOBJ), and Save Changed Objects (SAVCHGOBJ) commands allowed the general rules for authority to output files to be overridden by *SAVSYS special authority. Now these commands require the authority documented in the general rules to use output files.

Parameters changed to accept independent auxiliary storage pool device names

Some parameters that were introduced in V5R1 on the Restore Authorities (RSTAUT), Restore User Profile (RSTUSRPRF), Save Security Data (SAVSECDTA), and Save System (SAVSYS) commands will be replaced in V5R2. The V5R1 parameters accepted a number from 33 to 99. The V5R2 parameters accept independent auxiliary storage pool device names.

Table 2. Parameters changed for independent ASPs

Command	V5R1 parameter	V5R2 parameter
RSTAUT	RSTASP	RSTASPDEV
	OMITASP	SAVASPDEV
RSTUSRPRF	SAVASP	SAVASPDEV
	OMITASP	SAVASPDEV
	RSTASP	RSTASPDEV on RSTAUT command
SAVSECDTA	ASP	ASPDEV
	OMITASP	ASPDEV
SAVSYS	OMITASP	ASPDEV

CHGPERIOD, OPTION, or SYSTEM parameter changes

Prior to V5R2, if no objects qualified for a save or restore operation due to the values specified for the CHGPERIOD, OPTION or SYSTEM parameters, or because the objects were omitted using the OBJ parameter, an escape message was signaled indicating that no objects were saved or restored. This was not correct because nothing actually failed to save or restore. In V5R2, if all objects specified are excluded for one of these reasons, a completion message (CPC3715 or CPC3716) is sent that indicates how many objects were omitted for each reason.

Command changes to support libraries in independent ASPs

In V5R2, some commands no longer support 33-99 as an ASP keyword parameter. They now require the use of the ASPDEV keyword. The Change Recovery for Access Paths (CHGRCYAP) command no longer supports 33-99 for the ASPRCYTIME keyword; the ASPDEVRCY keyword will have to be used. A user must also have *USE authority to the ASP device in order to change the recovery time (in V5R1 when the ASP number was used, this authority was not required).

The semantics of the special value *SYSDFT, on the Edit Recovery for Access Paths (EDTRCYAP), CHGRCYAP, and Display Recovery for Access Paths (DSPRCYAP) commands are changed from 90 minutes to 70 minutes. Therefore, the system default access path recovery time, which is the value that is used if the user took no action to change the System Managed Access Path Protection (SMAPP) times, is changed from 90 minutes to 70 minutes. Users who have explicitly changed their times are not affected by this update.

The Create Library (CRTLIB) command no longer allows QRCLxxxxx, QRCYxxxxx, QRPLxxxxx, QSYSxxxxx, QSYS2xxxxx and SYSIBxxxxx to be created (where xxxxx is a number between 00000 and 99999).

The Clear Library (CLRLIB) command no longer allows QSYS2, QSYSxxxxx, QSYS2xxxxx, and QRCYxxxxx to be cleared (where xxxxx is a number between 00033 and 99999.)

The CRTLIB command no longer allows QRPLOBJ to be created in an ASP other than ASP 1.

The Delete Library (DLTLIB) command no longer allows QSYSxxxxx, QSYS2xxxxx, and QRCYxxxxx to be deleted (where xxxxx is a number between 00033 and 99999.)

Two new fields (ASP number-extended and ASP device name) have been added to the disk format of the QPMLPFRD API. The existing ASP number field cannot report ASP numbers greater than 99 so it will report -1 if the ASP number is greater than 99.

The following commands will produce reports as if CHGRPTONLY(*NO) was specified (even if *YES is specified) the first time the command is run in V5R2 if the same report had previously been run prior to V5R2.

Print Adopting Objects (PRTADPOBJ)

Print User Objects (PRTUSROBJ)

Print Job Description Authority (PRTJOBDAUT)

Print Subsystem Description Authority (PRTSBSDAUT)

Print Trigger Program (PRTTRGPGM)

Print Publicly Authorized Objects (PRTPUBAUT)

Print Private Authorities (PRTPVTAUT)

This is a result of new fields being added to the existing QSECxxxOLD, QPBxxxxxxx, and QPVxxxxxxx files in QUSRSYS, which makes it appear as if all of the records have changed. Change reports will work as usual after the first use of the command (with the same parameter values specified).

Exit programs registered at exit point QIBM_QPWFS_FILE_SERV must be stored in the system ASP or a basic user ASP. In previous releases there were no restrictions on where the exit program was stored.

Message queue parameter changes

The default value for the Message queue parameter (MSGQ) on the Create Device Tape (CRTDEVTAP) command and the Create Device Media Library (CRTDEVMLB) command has changed. The current default value of *LIBL/QSYSOPR has changed to *SYSOPR, which sets the default message queue to be QSYS/QSYSOPR.

The following commands are restricted from configuring the Message queue parameter value to QHST:

CRTDEVMLB/CHGDEVMLB
CRTDEVTAP/CHGDEVTAP
CRTDEVASP/CHGDEVASP
CRTDEVOPT/CHGDEVOPT
CRTDEVCRP/CHGDEVCRP

The following types of devices created on a pre-V5R2 release and which have been varied on prior to migrating to V5R2 will have their configured message queue and current message queue fields reversed. The only fix for this is to change the configuration of the object by using the corresponding change command.

CHGDEVMLB
CHGDEVTAP
CHGDEVASP
CHGDEVOPT
CHGDEVCRP

Start Performance Trace (STRPFRTRC) and Trace Internal (TRCINT) commands

In prior releases, when you specified a value of *MAX on the Size parameter on the STRPFRTRC and TRCINT commands, the maximum size of the trace table created by these commands was 988MB. In V5R2, the maximum size of the trace table has increased to 258,048MB (258GB). This change increases the amount of time the system requires to prepare the trace table, and could have an effect on system performance.

Default for maximum number of user libraries in library list changed

By default, the system will now allow 250 libraries in the user part of the library search list. To restrict specific jobs to the old limit of 25 libraries, create a data area named QLMTUSRLIB in a library that appears in the job's library search list. The data area must be TYPE(*CHAR) and the first character must be `'1'` (X'F1') in order for the limit to be 25. The data area QGPL/QLMTUSRLIB ships with the system and has a value of '0'. The first QLMTUSRLIB data area found using the job's library search list determines whether that job gets a limit of 25 libraries or a limit of 250 libraries. When no QLMTUSRLIB data area is found in the job's library search list, the job will allow 250 libraries in the user part of the library search list.

New object /dev/zero

Beginning in V5R2, the operating system will create a new object with path name `/dev/zero` and object type *CHRSF. If there is an existing object that is named `/dev/zero` and it is an object type other than *CHRSF, the existing object will be renamed `/dev/zero.prv` before the new `/dev/zero` object is created. If an existing `/dev/zero.prv` already exists, the original `/dev/zero` object is renamed `/dev/zero.prv.nnn`, where `nnn` is a value between 001 and 999. If objects already exist for all `/dev/zero.prv.nnn` names, the rename operation fails and the new `/dev/zero` file is not created. If the rename operation is successful, informational message CPIB41D is issued to the job log, which gives the new object name for the original `/dev/zero` object.

In V5R2, IBM remapped the file system IDs for all file systems except for independent ASPs. As a result, the `f_fsid` of the stavfs() API (and derivative APIs) or the `st_dev` field of the stat() API (and derivative APIs) have different numbers than in prior releases.

DB2 UDB for iSeries changes

Long column names

Prior to V5R2, long column names (alias names) were limited to 30 bytes in length. If the long column name was delimited by quotation marks, the 30-byte limit included the surrounding delimiters. For example, a column name of `"a123456789b123456789c1234567"` was the longest name allowed because the beginning and ending quotation marks were counted.

The limit in V5R2 is still 30 bytes. However, to be compatible with other database products, if the long column name is delimited, the 30-byte limit will not include the delimiters. For example, `"a123456789b123456789c123456789"` is now allowed. Applications can use the slightly longer name in SQL statements. COBOL's COPY-DDS specification will not support the slightly longer name.

A file with a longer column name can be saved and restored to a release prior to V5R2. However, on prior releases, the long name cannot be referenced in either SQL or COBOL. Only the short name can be referenced.

SQL compliance

New restrictions for check constraints

Attempts to create (add) check constraints or restore files containing check constraints that contain CURRENT DATE, CURRENT TIME, and CURRENT TIMESTAMP special registers or the CURTIME, CURDATE, or NOW functions will fail on V5R2.

New restrictions for WITH CHECK OPTION views

Views that specify the WITH CHECK OPTION will no longer create or restore if the WHERE clause contains a nondeterministic UDF or a nondeterministic built-in. These cases are disallowed by the ISO/ANS SQL standard.

Public authority change creating procedure or function using SQL naming

When an SQL or JAVA procedure or function is created using SQL naming, *PUBLIC authority is set to *EXCLUDE in V5R2 to comply with SQL standards. In previous releases, the authority that was used was taken from the CRTAUT value of the library into which the object was created.

Multisystem restriction

A scalar-subselect is not allowed in a query that references a distributed file. Also, a distributed file is not allowed in a scalar-subselect.

Dynamic SQL LIKE changed

The length allowed for a parameter marker value in the pattern expression of LIKE has changed. In prior releases, the length of the parameter marker was set to the length of the match expression. In V5R2, the length of the parameter marker is set to the maximum length allowed for the variable-length of the data type. If you ignored data truncation warnings in previous releases when using LIKE with a parameter marker value longer than the match expression, you may now receive different results.

QSQCHGDC API changes

In V5R2, if a package is created with a DFTRDBCOL, the QSQCHGDC API has no effect. In previous releases, the QSQCHGDC API, if used, set the library for the package.

In V5R2, the scope of the QSQCHGDC API has been changed from job scoped to activation group scoped.

Support for statements longer than 32K

SQL programs that contain SQL statements that are greater than 32K, and views that are created with a statement that is greater than 32K, will not be able to be restored to a release previous to V5R2.

Default schema and SET SCHEMA changes

If a default schema is passed to the database host server, the server issues SET SCHEMA *specified-schema-name*.

If a default schema is passed, CLI issues SET SCHEMA *specified-schema-name*.

CHAR function inconsistencies with packed decimal fields

If you have applied PTF SI09364, programs that use the SQL CHAR function on packed decimal fields may return different lengths. In some cases, programs may need to be recompiled. Prior to that change, the CHAR function returned incorrect field lengths for packed decimal fields or expressions of an even number precision. The expected results for a decimal to character conversion using the CHAR function are documented in the SQL Reference information:

`http://publib.boulder.ibm.com/iseries/v5r2/ic2924/index.htm?info/db2/rbafzmstscale.htm`

SQL procedures that contain atomic compound-statements

In prior releases, SQL procedures that contained atomic compound-statements generated explicit ROLLBACK and COMMIT statements to either commit or roll back the changes that occurred within the atomic compound-statement. A change has been made to use only savepoint statements within atomic compound-statements. This means that the application is now responsible for committing or rolling back the transaction and any changes that occurred in the compound-statement. To maintain pre-V5R2 behavior, you need to specify COMMIT ON RETURN on the procedure definition. The implication here is that without the COMMMIT ON RETURN, any changes done within the atomic stored procedure will still be pending upon exit from the SQL procedure. This change occurs only when the SQL procedure is recreated from the original source file. This change does not occur for existing SQL procedures that have been compiled into a *PGM object.

In prior releases, an SQL procedure that contained an atomic compound-statement could not perform any SQL operations if the procedure was not called at a commit boundary. SQLSTATE 24401 SQLCODE -428 was sent. With the removal of COMMIT and ROLLBACK statements in an atomic compound-statement, this restriction is removed. This only applies to newly created SQL procedures. It does not affect existing SQL procedures.

QAQQINI File

If a QAQQINI file exists in any library other than QSYS or QSYSVxRxMx, review Informational APAR II13320. To determine if QAQQINI files exist in any other library, enter the following command:

```
WRKOBJ OBJ(*ALL/QAQQINI) OBJTYPE(*FILE)
```

System library SYSIBM added

SYSIBM has been added as a new system library in V5R2. The SYSIBM library, reserved for use by DB2® UDB for iSeries, is created during the installation process. If a library named SYSIBM already exists, the library attributes (including ownership, public authority and text description) are changed, but no objects are deleted from the library. Like other system libraries, the SYSIBM library cannot be deleted, renamed, or cleared. The SYSIBM library will be included in the list of libraries when special value *ALLUSR is specified as the library name; for example, when LIB(*ALLUSR) is specified on the Save Library (SAVLIB) command.

Default authority for QADBXRDBD file changed

Default (*PUBLIC) authority for relational database (RDB) directory file QADBXRDBD in library QSYS was changed in V5R2. It is possible that an existing program may no longer run correctly in the case that the program accessed the RDB directory using this file. In prior releases, this file was built with operational authority granted to *PUBLIC, but in V5R2 that is no longer true. Unless the user

has *ALLOBJ special authority, he will have to now access the logical file named QADBXRMTNM which is built over QADBXRDBD.

Substring changes for database queries involving varying-length fields

For database queries, when the length operand is explicitly specified for an SQL SUBSTR or LEFT scalar function, the result will now always be padded up to the length specified by this operand. Prior to V5R2, this occurred only when the length operand was specified by a constant or the expression that specifies the string from which the result is derived had a large object data type.

This also affects SQL views, programs, procedures, functions, and trigger programs created by specifying the SUBSTR or LEFT scalar function. Those objects created prior to V5R2 and opened, queried, or run on a V5R2 server now use the new padding behavior. Those objects created on V5R2 and opened, queried, or run on a prior release use only the old padding behavior.

The following query examples illustrate the difference between V5R1 and V5R2. The examples use Interactive SQL commands entered from a command line after running the STRSQL command.

V5R1 example using an explicit length

```
> SELECT  HEX(SUBSTR(VARCHAR('ABC',10),1,7)) FROM PROJECT/EMPLOYEE
....+....1....
HEX
C1C2C340404040
```

V5R1 example using a length expression

```
> SELECT  HEX(SUBSTR(VARCHAR('ABC',10),1,7+0)) FROM PROJECT/EMPLOYEE
....+....1....+....2
HEX
C1C2C3
```

V5R2 example using an explicit length

```
> SELECT  HEX(SUBSTR(VARCHAR('ABC',10),1,7)) FROM PROJECT/EMPLOYEE
....+....1....
HEX
C1C2C340404040
```

V5R2 example using a length expression

```
> SELECT  HEX(SUBSTR(VARCHAR('ABC',10),1,7+0)) FROM PROJECT/EMPLOYEE
....+....1....+....2
HEX
C1C2C340404040
```

Nested transactions on DB2 Multisystem

For V5R2, the addition of nested transactions adds the requirement that all nodes of a DB2 Multisystem be at the V5R2 release. Secondary commit cycle requests from servers prior to V5R2 will be upgraded to use a nested transaction. Requests sourced at a V5R1 server operate correctly at a V5R2 server, but nested transactions sourced at a V5R2 server receive a CPF8353 error message from V5R1 servers, because V5R1 servers support only a primary and one secondary commit cycle.

Ending an activation group in job that allows multiple threads

Prior to V5R2, ending an activation group in the primary thread of a job that allows multiple threads caused the whole job to end. In V5R2, ending an activation group in the primary thread of a job that allows multiple threads causes any secondary threads to end, but the primary thread is not ended. Ending an activation group in a secondary thread still causes the whole job to end.

Integrated file system *TYPE2 directory support added

The ″root″ (/), QOpenSys, and user-defined file systems (UDFS) in the integrated file system support the *TYPE2 directory format. The *TYPE2 directory format is an enhancement of the original *TYPE1 directory format. *TYPE2 directories have a different internal structure and different implementation than *TYPE1 directories. The advantages of *TYPE2 directories include improved performance, improved reliability, added functionality, and (in many cases) less auxiliary storage space.

To begin taking advantage of Type2 directories, it is recommended that you use the conversion utility provided with OS/400 as soon as possible. You can do this conversion either while you are still using V5R1, as a last step when you install V5R2, or at a later time of your choosing. This utility has an estimator which predicts how long the conversion is expected to take. Note that if you have an independent ASP, the first time that you vary it on to a system running V5R2, the conversion to Type2 directories will automatically occur during the vary-on operation.

For more information about Type2 directories and the conversion utility, see the iSeries Information Center topic *TYPE2 directories (**File Systems and Management –> Integrated File System –> Concepts –> Directory –> *TYPE2 directories**). If you are using the Supplemental Manuals CD-ROM, change to the Information Center CD-ROM, then click the link.

Directory conversions

When upgrading from V4R5 to V5R2, integrated file system conversions are needed. Most of these conversions occur when the objects are first used. However, some conversions may take place during the installation. The following explains when conversions will be done, how long the conversions may take, and actions you can take to control the conversions.

V4R5-to-V5R2 installation conversions

If your iSeries server has primary or secondary language 2984 (English DBCS uppercase/lowercase) or 2986 (Korean DBCS), or it has Korean Hangeul characters in integrated file system object names, this topic on installation conversions applies.

If you are upgrading from V4R5 to V5R2 and the OS/400 operating system has primary or secondary language 2984 (English DBCS uppercase/lowercase) or 2986 (Korean DBCS), then installation conversion automatically occurs.

Conversions during a V4R5 to V5R2 software upgrade focus on adjusting the code points of Korean Hangeul characters in integrated file system object names to be compatible with CCSID 13488. The amount of time needed for this conversion depends on the system configuration and the number of object names that need to be converted. Use the following information as a guideline to estimate this time:

D = Number of directories (*DIR object type)
F = Number of stream files (*STMF object type)
Minimum time needed = ((6*D + F) / 82020) + D/1260 minutes
Maximum time needed = ((6*D + F) / 10936) + D/1260 minutes

The more object names that need conversion, the longer it will take. Thus, if no names need conversion, it will take the minimum amount of time listed in the table. If all names need conversion, it will take the maximum amount of time.

To determine the number of directories (D) and stream files (F), do the following:

1. Run the RTVDSKINF command. This runs in the background and collects information about all objects on the system. This may take a long time.
2. Do one of the following:
   - Using Operations Navigator, expand the iSeries icon for the system to be upgraded. Highlight the database icon, then use the File dialog box to select `Run SQL script`. When the script entry window appears, enter the following SQL statements:

     select COUNT(*) from QUSRSYS.QAEZDISK where diobtp = 'DIR' (this will return the value to use for D in the formula)

     select COUNT(*) from QUSRSYS.QAEZDISK where diobtp = 'STMF' (this will return the value to use for F in the formula)
   - If you have DB2 Query Manager and SQL Development Kit for iSeries, 5722-ST1, run STRSQL from the iSeries command line and enter the following SQL statements:

     select COUNT(*) from QUSRSYS/QAEZDISK where diobtp = 'DIR' (this will return the value to use for D in the formula)

     select COUNT(*) from QUSRSYS/QAEZDISK where diobtp = 'STMF' (this will return the value to use for F in the formula)

If you know that your server does **not** have Korean Hangeul characters in integrated file system object names, you can avoid this installation conversion by creating a data area **before the installation begins**. To create the data area, enter the following:

```
CRTDTAARA DTAARA(QUSRSYS/QP0DUCNO) TYPE(*CHAR)
```

Note that the third character in the data area's name is a zero.

You can force the installation conversion to occur if your OS/400 operating system does not have primary or secondary language 2984 or 2986 and either of the following is true:

- You know that your server has Korean Hangeul characters in integrated file system object names
- You are unsure if object names have these characters

Create a data area before the installation begins by entering the following:

```
CRTDTAARA DTAARA(QUSRSYS/QP0DUCYES) TYPE(*CHAR)
```

Note that the third character in the data area's name is a zero.

V4R5-to-V5R2 conversions on first use

Other conversions (not associated with Korean characters) occur on the first use of integrated file system objects after upgrading from V4R5 to V5R2. It is not expected that these conversions will significantly degrade performance. However, if you have a large number of integrated file system objects and you save these objects immediately after installing, all of these conversions will occur during the save operation, which could take longer than in previous save operations.

Cluster resource group conversion

Cluster resource group objects are converted upon the first use of the object. The first use happens in either of the following situations:

- Clustering is started on the node
- A list or display of the cluster resource group is requested

The conversion should not have a noticeable effect on system performance.

XML parser service programs being removed at future release

The XML for C++ and procedural parsers, currently shipped in service programs QXML4C310 and QXML4PR310 in library QSYS, will be removed in the next release of OS/400. XML parser technology is evolving at a rapid pace with new release levels happening more frequently than OS/400 releases. Also, new releases are not necessarily compatible with prior XML parser releases. In order to deliver XML parsers that are more current with the changes in XML technology, a new approach of delivering XML parsers is being addressed by the XML Toolkit for iSeries, LPO 5733-XT1.

System value changes

The following system values have changed in V5R2.

QAUTOVRT system value

The QAUTOVRT system value is used to control the number of virtual display device descriptions created by the system. In previous releases, this value only affected the following scenarios:

- Devices that were attached to controllers that have names that begin with QPACTL with 2 to 4 numeric characters appended (QPACTL01, QPACTL02, for example).
- A value of 0 would prevent autocreation of devices for which a specific name was given for device selection and autocreation. This specific name could have been generated in one of the following methods:
  - The name could have been requested by the client during negotiation with the TELNET client server.
  - The name could have been generated by a TELNET user exit.
  - The name could have been generated by a program that uses the Virtual Terminal Manager APIs.

For clients using TELNET or the Virtual Terminal Manager APIs in V5R2, a numeric value specified for QAUTOVRT system value is compared to the total number of virtual device descriptions that are attached to controllers that begin with QPACTL or QVIRCD with 2 to 4 numeric characters appended (for example,

QPACTL01, QPACTL02, or QVIRCD0001). If autocreation of an additional device description exceeds the QAUTOVRT system value, no additional virtual device descriptions are created for these clients.

This change does not affect users of 5250 display station passthrough, or clients who request sessions by using the target passthrough support on the system.

QRETSVRSEC system value

When the system value, QRETSVRSEC, is changed from 1 to 0, the security-related information is no longer removed from the server. Instead, it becomes inaccessible. From a user standpoint, the behavior will not have changed. To remove this security-related information, use the Clear Server Security Data (CLRSVRSEC) command. To make the security-related information accessible again, change the QRETSVRSEC value from 0 to 1.

A restore operation of *SECOBJ and *VLDL always restores whatever is on the save media, regardless of the value of QRETSVRSEC.

QFRCCVNRST system value

For V5R2, the meaning of the QFRCCVNRST values has changed. The value 0 in previous releases maps to the current value 1, and the value 1 in previous releases maps to the current value 2. The value of the QFRCCVNRST system value is converted during the OS/400 installation to maintain its previous meaning or function.

When an object should be converted, but cannot be converted, it will not restore. In previous releases, some objects were restored even though they could not be converted when requested. For example, IMPI-format objects that were not observable, and therefore could not be converted, would be restored as IMPI-format objects even when QFRCCVNRST is set to 1 or when the FRCOBJCVN (*YES *ALL) parameter is specified on a restore command. Also in previous releases, objects with validation errors that could not be converted would be restored with all authorizations revoked. In V5R2, if the QFRCCVNRST system value or the FRCOBJCVN parameter specify that these objects should be converted, the objects will not restore if they cannot be converted. The new QFRCCVNRST value of 0 allows objects to restore without any conversion.

Delete Cluster Resource Group compatibility

An additional exit program invocation occurs during the Delete Cluster Resource Group (QcstDeleteClusterResourceGroup) API and the Delete Cluster Resource Group from Cluster (DLTCRGCLU) command. When the current cluster version is 3 or above, the exit program is invoked during the verification phase. The action code Verification phase (QcstCrgAcVerificationPhase) with action code dependent data Delete Crg (QcstDltCrg) will be passed to the exit program. The exit program can use this action code to determine if the cluster resource group can be deleted. If the exit program returns with a success indication, Cluster Resource Services continues with the delete request. If the exit program returns with a failure indication, Cluster Resource Services fails the delete request.

If you wrote your exit program to return failure for unknown action codes, you must change the exit program in order to successfully complete the Delete Cluster Resource Group API or Delete Cluster Resource Group from Cluster command.

Performance Explorer data file changes

The database structure for storing Performance Explorer (PEX) trace data is changed. The new structure is simplified so the user does not need to do as many JOIN operations to get the same information. It conserves space by not storing dissimilar event types in one file, and stores 8-byte integers as 8-byte integers, rather than converting them to packed fields.

Some PEX database files were combined, and some are no longer used. The following table identifies those files.

Table 3. PEX database files that have been changed

PEX database file	V5R2 change
QAYPECICFG	Combined into QAYPECFGI
QAYPECOCFG	Combined into QAYPECFGI
QAYPEHWCFG	Combined into QAYPEPROCI
QAYPELICI	Combined into QAYPECFGI
QAYPEMII	Combined into QAYPEPROCI
QAYPENLIC	Combined into QAYPEPROCI
QAYPENMI	Combined into QAYPEPROCI
QAYPEPERD	No longer support periodic mode
QAYPEPSUM	No data (obsolete)
QAYPEPWDW	No data (obsolete)
QAYPESTCFG	Combined into QAYPECFGI
QAYPES36	No longer support System/36™ events
QAYPETRCFG	Combined into QAYPECFGI
QAYPETRCPT	Merged back into QAYPETIDX
QAYPEUNKWN	Use QAYPEUSRDF instead for this data

The DTAFILE parameter, which was used to store the entire PEX collection in a single file, was removed. This was used mainly to send a collection to IBM. Now you can send just the management collection object.

Following are other changes:
- The INCDEPJOB parameter was removed from the ADDPEXDFN command.
- The public authority to the QAYPE* files is changed to *EXCLUDE.
- The QSYSOPR user profile's private authority to PEX commands has been removed.
- The QPEX user profile owns the files in QPEXDATA library.
- The QPEX user profile owns the files QAPEXDFN and QAPEXFTR in library QUSRSYS.
- The QPEX user profile is granted *ALL object authority to the QAYPE* files in a user named library.
- The public authority to the QAPEXDFN file is changed to *EXCLUDE.

To use any of the PEX commands, you must now have either *SERVICE special authority or be authorized to the Service Trace function of Operating System/400 through iSeries Navigator's Application Administration support. You can also use

the Change Function Usage Information (QSYCHFUI) API, with a function ID of QIBM_SERVICE_TRACE, to change the list of users that are allowed to perform trace operations.

Changes for lock materialization MI instructions

In V5R2, lock materialization MI instructions MATAOL, MATOBJLK, and MATDRECL can return a transaction control structure system pointer at the same offset that a process control space system pointer is returned in prior releases. If the returned system pointer is used in a MI instruction that only accepts a process control space system pointer, that instruction will fail if a transaction control structure system pointer is used. A system pointer to a transaction control structure will be returned if materializing lock information on a transaction object. You can determine if the returned lock information is for a transaction object by checking the value of the *Lock scope object type* field in the returned data.

Java programming changes

Prior to V5R2, it would be possible for the JNI_GetCreatedJavaVMs function to return more than one Java virtual machine in its list of Java virtual machines. In V5R2, the JNI_GetCreatedJavaVMs returns at most one Java virtual machine.

Prior to V5R2, the JNI_CreateJavaVM function could be called repeatedly within a single process, and with each successful invocation a separate and distinct Java virtual machine was created. In V5R2, the JNI_CreateJavaVM function returns an error code (`JNI_EEXIST -5 VM Already Created as defined in jni.h`) whenever a Java virtual machine has already been created in the current process.

Prior to V5R2, the DestroyJavaVM function destroyed the Java virtual machine and returned its resources to the process. In V5R2, the DestroyJavaVM function returns an error code (`JNI_ERR -1 error defined in jni.h`).

Message waiting light

In previous releases, the message waiting light would be set when the sign-on display was put on the workstation by the subsystem. This indicated if there was a message on the workstation message queue.

This function has been removed in V5R2. When a sign-on display is displayed by a subsystem, the message waiting light is no longer a valid indicator for whether there is a message on the workstation message queue. The message waiting light retains its current function while a user is signed on to the workstation.

Expanded time value for sent messages

In V5R2, the time field for when a message was sent has been expanded to include microseconds. This longer time field changed the relative starting positions of the fields on the first line of each message in printed job logs. The remaining lines for each message are not changed.

Management Central connectivity updates

When using V5R2 Management Central in a network that includes V5R1 OS/400 or V5R1 Client Access Express for Windows, you must update all V5R1 iSeries servers and V5R1 Client Access Express for Windows software as follows to avoid connection error conditions:

- Client Access Express Service Pack PTF 5722XE1 V5R1M0 SI01907 or higher.
- OS/400 V5R1 PTF cum package C1302510 (marker PTF TC01302) or higher, **or** individually install the following 5 PTFs for 5722SS1:
  SI01375
  SI01376
  SI01377
  SI01378
  SI01838

With these PTFs, the Job Monitor, Message Monitor, System Values, and BRMS applications will be able to support SSL communications. See the PTF cover letters for further information.

Directory Services (LDAP) changes

For security auditing, the audit record of type DI has been changed to record the original bind identity in the distinguished name (DN) field. In V5R1, when the bind was an administrator bind, the DN audited was the administrator DN value that is configured for Directory Services, not the DN used for the bind.

Also for V5R2, the DI audit record is changed to write the results in the QDIRSRV job's CCSID instead of CCSID 13488 for the *User name*, *Object name*, *Owner name*, and *New name* fields.

When checking the status of a V5R2 Directory Server from an earlier version of Operations Navigator (that is, V4R5 or V5R1), the connections in the server will not be displayed for security reasons. Beginning in V5R2, iSeries Navigator displays this information if you have the proper authority. From the command line or an LDAP API, this information was previously retrieved using `cn=monitor` on an LDAP search request. To get connection information in V5R2, you must be bound as an administrator and use `cn=connection,cn=monitor`.

The ldap_first_attribute and ldap_next_attribute LDAP APIs now require the use of the ldap_ber_free API to free *berptr when its use is completed. If you have LDAP programs that use these APIs and do not free *berptr, then you can possibly have a memory leak.

The Directory Services client and server were changed in V5R2 so that they do not send the criticality flag in a control when its value is false as required by the LDAP standard. The V5R1 5722SS1 PTF SI02238 enables the client and server to receive standard controls. If the non-standard behavior is required by the V5R2 server, you can set the environment variable QIBM_GLD_ALWAYS_SEND_ISCRITICAL to 1 for the server or client job.

QIBM_QPWFS_FILE_SERV exit point changes

The file server exit program (QIBM_QPWFS_FILE_SERV) for iSeries Support for Windows Network Neighborhood (iSeries NetServer) clients will be called during initial connection. This could affect your current applications if you do not expect the exit program to be called.

TCP availability improvements

Three new records in the TCP/IP attributes file (QUSRSYS/QATOCTCPIP) are added to support Network Fast Cache, TCP/IP Close Connection Logging, and TCP minimum retransmit time. The new records are added to the file the first time the file is accessed. This is done by defining a new version record for the file. V5R2 is now used to identify the version of the file. Conversion program QTOICONV will be responsible to ensure that the file is at the proper level. After conversion takes place, QTOICONV will ensure the V5R2 version record is in the file to show the file has been updated.

Proxy ARP support for *VIRTUALIP interfaces

Since V4R3, IBM has said that *VIRTUALIP interfaces are not directly routable. This means that, for external machines to send data to a *VIRTUALIP interface, explicit routes must be configured in each of these external devices. This also means that the same *VIRTUALIP address can be configured on multiple machines without creating duplicate IP address situations.

With this new *VIRTUALIP proxy support, the above may no longer be true. To prevent existing configurations from breaking upon upgrading to V5R2, the default value for the new *VIRTUALIP Proxy option is NO. However, *VIRTUALIP Proxy ARP can be enabled for only one instance of a given *VIRTUALIP address in the network. You can only have one *VIRTUALIP address (with Proxy ARP enabled) defined on a machine for a given network. Otherwise, a duplicate IP address conflict will be detected.

Prestart and batch immediate jobs in new subsystems

Default DDM server jobs moving to QUSRWRK subsystem

Beginning in V5R2, the DDM server jobs (QRWTSRVR) may be configured to run in user-defined subsystems. The default subsystem for running the DDM server jobs has been changed from QSYSWRK to QUSRWRK. This places both the default DDM server jobs and the default OS/400 Host Server server jobs in the QUSRWRK subsystem.

If the DDM server jobs are not running and the DDM listener job is, batch immediate DDM server jobs will still be run under the QSYSWRK subsystem.

File server prestart job configuration

In previous releases, TCP/IP file server clients and iSeries NetServer clients could only connect to server jobs (QPWFSERVSO, QPWFSERVSS, and QZLSFILE) if these were prestarted jobs in the QSERVER subsystem. If the prestart job entries were not defined in QSERVER, the client could not connect.

Starting in V5R2, if a prestart job (PJ) does not exist, the client connects to a batch immediate (BCI) job in the QSERVER subsystem if the configuration allows it (the Subsystem display has the Alternate action property set to `Start in current subsystem`). This may result in jobs with type BCI instead of PJ when viewing the "Work with Active Jobs" for the QSERVER subsystem.

Because the file server and iSeries NetServer prestarted jobs can now be defined for any subsystem, these prestart jobs may not function if a subsystem description

(*SBSD) is saved on V5R2 and restored on a release prior to V5R2. Prior to V5R2, these jobs were allowed only in the QSERVER subsystem.

Changes when ending QSERVER subsystem

In previous releases, active file server jobs (QPWFSERVSO and QPWFSERVSS) and iSeries NetServer (QZLSFILE) jobs would continue to function after ENDSBS SBS(QSERVER) OPTION(*CNTRLD). Active jobs would continue to process requests until a normal end operation. When all active jobs in the subsystem ended, the subsystem would end.

In V5R2, the system can be configured to allow file server and iSeries NetServer jobs to run in user-specified subsystems. This requires that all active file server and iSeries NetServer jobs must be ended when the QSERVER subsystem is ended. In V5R2, the command ENDSBS SBS(QSERVER) OPTION(*CNTRLD) will end all file server and iSeries NetServer jobs immediately.

Performance data

If you are using Collection Services or Performance Management/400, you will see an increase in the size of the management collection (*MGTCOL) objects created as well as the performance database files created. The additional storage requirements are the result of several new data categories that may be collected.

The most notable change occurs for the *JOBMI category data because of new metrics and a new file (QAPMJOBWT). The storage used by this file with performance data will be approximately 60% of that used by the QAPMJOBMI file.

Collecting performance data

In previous releases, performance database files created by the replaced release would be down-level and unusable by functions of the new release until the Convert Performance Data (CVTPFRDTA) command was used to upgrade the files. Consequently, some performance data was lost. This impacted PM/400 and certain Performance Tools (PT1) product functions as they are dependent on these files for data collection and reporting. In V5R2, if you are using collection services or PM/400 and your collection library contains performance database files from a prior release, those files may be moved to a new library named QPFRDvrmnn (where `vrm` is the OS/400 version, release, and modification of the current release and `nn` is a unique sequence number starting with 01). If you do not want to keep the data from the previous release, you should delete the back-level file library (QPFRDvrmnn).

For V5R2, PM/400 automatically collects performance data unless you upgrade OS/400 from a previous release and had turned off PM/400 performance data collection on the previous release.

The data is not transmitted to IBM until you give permission to send it to IBM or if you have given permission to send it to IBM in a previous release. You can give permission to send the data by using the CFGPM400 command or the PM/400 Q1PSTRPM API. The benefit of automatically collecting performance data is that it will start collecting data so you have data when you need it. This also allows you to receive PM/400 reports sooner after activation.

If you do not want PM/400 to automatically collect performance data, you can turn off PM/400 by using the PM/400 Q1PENDPM API.

You can find more information on PM/400 in the iSeries Information Center and at the following Web site:

`www.ibm.com/eserver/iseries/pm400/`

Quality of Service changes

If you have configured a QoS policy in V5R1 and want to upgrade to V5R2, the iSeries Navigator QoS Configuration Wizard must be run to convert the policy to a LDAP directory format before the V5R2 QoS server will load the V5R1 rule set to the QoS Manager. This means that the QoS rules will not be active on the server until the Configuration Wizard is run the first time. The V5R2 version of the iSeries Navigator must be used for this function in V5R2 because the V5R1 version of QoS policy data is not compatible with the V5R2 QoS server.

QSYS2 library changed to user library

Library QSYS2 will be saved with SAVLIB *ALLUSR and no longer will be saved by SAVLIB *IBM.

Security changes

Beginning in V5R2, the following enhanced integrity functions are activated at security level 40:

- Validating parameters
- Preventing modification of some internal control blocks.

These changes enhance the integrity of the system at the default security level. Any applications or programs you have that will not run at security level 50 will now probably not run at security level 40 either. All IBM applications are developed to work at security level 50. In general, business partner applications are also developed to work at security level 50.

Owner authority changes

In V5R2, the owner authority for objects created through the PC file server in the root file system defaults to *ALL authority (all object authorities and all data authorities). In prior releases, the owner authority was inherited from the owner authority of the parent directory. This change enables PC applications to successfully save existing files without relying on the owner of the parent directory having the correct authority. This affects clients such as iSeries Access for Windows, iSeries Support for Windows Network Neighborhood (iSeries NetServer), and QFileSvr.400. This applies only to the owner authority. Private authorities will continue to be inherited from the parent directory.

Service tools user IDs

With V5R2, a service tools user will not be allowed to change his password at SST or with the Change Dedicated Service Tools User ID (QSYCHGDS) API when the password is expired and is the default. A default password is one where the password is the same as the user ID.

For service tools user IDs that are expired and defaulted, or for newly created service tools user IDs that are created with a default password and marked expired, the user will need to sign on to DST to change the password.

Alternatively, a user with sufficient authority and a password that is not both the default and expired can use the QSYCHGDS API to change the password for the other user.

When the QSECOFR service tool user ID is reset with the CHGDSTPWD PASSWORD(*DEFAULT) command, the owner of the QSECOFR service tool user ID needs to sign on to DST to change the password.

If you have a strong requirement to allow service tools users that have default and expired passwords to change them through the Start System Service Tools (STRSST) command or the QSYCHGDS API, you can change back to the old behavior by setting the `Allow service tools user ID with a default and expired password to change its own password` option to Yes on the Work with System Security display, which can be accessed from DST or SST. However, this less restrictive setting is not recommended. Rather, your procedures should be changed to manage service tools user IDs without allowing defaulted and expired passwords to be changed from SST or the QSYCHGDS API.

New message sent from Change Service Tools User ID (QSYCHGDS) API and Start Service Tools (STRSST) command

If an application has coded a call to the Change Service Tools User ID (QSYCHGDS) API and all of the following conditions are true, the QSYCHGDS API will signal the new message CPF4AB7, `Service tools user ID password cannot be changed`.

- The requesting service tools user ID is the same as the new service tools user ID.
- The current password of the service tools user ID is the default and it is expired.
- The installation is configured to prevent service tools user IDs with default-expired passwords from being able to change their own passwords. (This is the default value that is shipped with the system.)

If users attempt to change their service tools user ID password from the Start Service Tools (STRSST) Sign On display and all of the following conditions are true, the new message CPF4AB7, `Service tools user ID password cannot be changed`, is displayed on the bottom of the sign-on display.

- The current password of the service tools user ID is the default and it is expired.
- The installation is configured to prevent service tools user IDs with default-expired passwords from being able to change their own passwords. (This is the default value that is shipped with the system.)

Work with SST privilege changes

When a system is upgraded to V5R2, the Work with SST privilege is automatically given to Service tools user IDs QSECOFR, QSRV, 22222222, and all other existing service tools user IDs. The new privilege is not given to Service tools user ID 11111111.

The Service Tools Security user ID (QSECOFR) will need to explicitly grant the new privilege to user ID 11111111, if needed.

In addition, all existing service tools user IDs should be reviewed and only those users that require STRSST capability should be given the privilege.

The Work with SST privilege is not given as a default to newly created service tools user IDs. It must be explicitly granted.

IPX support removed

IPX support is no longer available on OS/400.

Connectivity to iSeries servers running OS/400 V5R2 from client systems will no longer be possible in environments where you are using IPX as your network transport protocol.

You will have to change to use TCP/IP for functions such as Enhanced Netware Integration and iSeries Access.

IPX description (*IPXD) objects will no longer restore from prior releases.

The following CL commands are no longer available in V5R2:

ADDIPXCCT (Add IPX Circuit)
ADDCCTRTE (Add Circuit Route)
ADDCCTSRV (Add Circuit Service)
ADDIPIADR (Add IP over IPX Address)
ADDIPIRTE (Add IP over IPX Route)
ADDSNILOC (Add SNA over IPX Location)
CFGIPI (Configure IP over IPX)
CFGIPX (Configure IPX)
CHGIPXCCT (Change IPX Circuit)
CHGIPXD (Change IPX Description)
CHGCCTRTE (Change Circuit Route)
CHGCCTSRV (Change Circuit Service)
CHGIPIADR (Change IP over IPX Address)
CHGIPIIFC (Change IP over IPX Interface)
CHGSNILOC (Change SNA over IPX Location)
CRTIPXD (Create IPX description)
DSPCCTSRV (Display Circuit Service)
DSPCCTRTE (Display Circuit Route)
DSPIPXCCT (Display IPX Circuit)
ENDIPX (End IPX)
ENDIPXCCT (End IPX Circuit)
ENDIPIIFC (End IP over IPX Interface)
IPXPING (Verify IPX Connection)
RMVIPXCCT (Remove IPX Circuit)
RMVCCTRTE (Remove Circuit Route)
RMVCCTSRV (Remove Circuit Service)
RMVIPIADR (Remove IP over IPX Address)
RMVIPIIFC (Remove IP over IPX Interface)
RMVIPIRTE (Remove IP over IPX Route)
RMVSNILOC (Remove SNA over IPX Location)
STRIPX (Start IPX)
STRIPXCCT (Start IPX Circuit)
STRIPIIFC (Start IP over IPX Interface)
VFYIPXCNN (Verify IPX Connection)
WRKCCTRTE (Work with Circuit Route)
WRKCCTSRV (Work with Circuit Service)
WRKIPXCCT (Work with IPX Circuits)
WRKIPXSTS (Work with IPX Status)
WRKCCTRTE (Work with Circuit Route)

You will have to change your CL command source and CL programs if you have explicitly coded the following IPX-related command parameter values:

CRTDEVNET command (TYPE parameter; value of *IPX)
TRCINT command (TRCTYPE parameter; value of *IPX)
PRTCMNTRC command (FMTIPX parameter; value of *YES)
RSTCFG command (OBJTYPE parameter; value of *IPXD)
RTVCFGSRC command (CFGTYPE parameter; value of *IPXD)
STRHOSTSVR command (RQDPCL parameter; value of *IPX)
ADDCCTSLT command (RMTLOCNAME parameter; address type of *IPX)
CRTOUTQ command (CNNTYPE parameter; value of *IPX)
CHGOUTQ command (CNNTYPE parameter; value of *IPX)
CHGPOPA command (HOSTSVRCNN parameter; value of *IPX)

Remote writer and output queue support for IPX and NETWARE3

If you have an application from a previous release (pre-V5R2) that automatically created remote output queues with a connection type of *IPX or a destination type of *NETWARE3, that application now fails at V5R2, and a command message is then issued.

If you attempt to start a remote writer to an output queue with a Destination type of *NETWARE3 that was saved from a previous release, the writer will end with message CPF331E. The job log from the ended writer will have a message that will explain that NETWARE3 is no longer supported.

Support for Novell Netware 3.x servers withdrawn

Customers currently working with remote output queues (OUTQ) created with a destination type *NETWARE3 in previous releases can still be restored; however, they cannot be used to start remote writers.

NetWare Authentication entries for *NETWARE3 can still be restored from previous releases, but they cannot be used to start connections to NetWare 3.x servers.

In both cases, if you try to start remote writers or NetWare connections, you will receive a message that NetWare 3.x servers are no longer supported.

The following commands are being changed in a way that could cause a CL program to fail or work differently:

ADDNTWAUTE (Add NetWare Authentication Entry)
- SVRTYPE(*NETWARE3) is no longer supported.
- SERVER parameter is no longer supported.

CHGNTWAUTE (Change NetWare Authentication Entry)
- SVRTYPE(*NETWARE3) is no longer supported.
- SERVER parameter is no longer supported.

VFYNTWAUTE (Verify NetWare Authentication Entry)
- SVRTYPE(*NETWARE3) is no longer supported.

STRNTWCNN (Start NetWare Connection)
- SVRTYPE(*NETWARE3) is no longer supported.

WRKNWSSTS (Work with NWS Status)
- SVRTYPE(*NETWARE3) is no longer supported.

CHGNWSA (Change NWS Attributes)
- NTW3SVRLST parameter is no longer supported.

CHGNWSUSRA (Change NWS User Attributes)
- NTW3SVRLST parameter is no longer supported.

Some commands related to authentication entries will continue supporting SVRTYPE(*NETWARE3), but only to allow customers to remove them or display them.

Note: Novell Corporation is no longer shipping and supporting NetWare 3.x, 4.10 and 4.11 versions. They are encouraging their customers to migrate to NetWare supported releases (4.2, 5.0, and 5.1), which are already supported by IBM Enhanced NetWare Integration. Despite this, Enhanced NetWare will continue supporting NetWare 4.10 and 4.11.

Workstation gateway option removed

Support has been removed for Workstation Gateway in V5R2, which has been replaced by the 5250 function of iSeries Access for Web product (5722-XH2). This product is licensed as part of iSeries Access (5722-XW1). The following CL commands have been modified to remove the workstation gateway server as an option:

STRTCPSVR
No longer supports SERVER(*WSG) as a parameter value.

ENDTCPSVR
No longer supports SERVER(*WSG) as a parameter value.

CFGTCPAPP
Configure workstation gateway (Option 15) is no longer available

CHGWSGA
No longer available.

CFGTCPWSG
No longer available.

CMDWSG
This menu is no longer available.

WRKSRVTBLE
No longer shows service `wsg` at port `5061` for protocols TCP and UDP.

Attempting to use a Web browser to connect to a WSG server at V5R2 will no longer work, since WSG server will no longer exist and there will no longer be a WSG listener at port 5061 (default for WSG).

For servers that have been upgraded to the V5R2 OS/400 release, program objects associated with the WSG server are deleted. In addition, exit point QIBM_QTMT_WSG format QAPP0100 is removed.

Exit point added for replies to inquiry messages

A new exit point, QIBM_QMH_REPLY_INQ, was added to call user exit programs when a reply is sent to an inquiry message. The exit program can accept, reject, or replace the reply value.

A system that uses the new function can have the following impacts:

- Users and programs could see CPF2477 (message queue in use) more often on V5R2 if exit programs take longer to complete than the job's default wait time. If you receive this message, you should try running the function again.
- A reply to an inquiry message that was previously accepted can now be rejected or replaced by a reply handling exit program. When a reply is rejected, existing

error message CPF2422 (reply not valid) will be issued. If programs are not monitoring for the error, they will function check.

Remote journal considerations

If you are using a TCP connection for your remote journals where the source and target systems are at V5R2, the remote journal connection will fail if the remote database directory entry on the source system does not have the same name as the local relational database entry on the target system.

Also, if you are connecting from a previous release to a V5R2 system with a TCP remote journal connection, you cannot place the target remote journal on an independent ASP. It must be in the base system ASP.

DDM considerations

If you are using a TCP connection for your DDM files where the source and target systems are at V5R2, the connection will fail if the remote database directory entry on the source system does not have the same name as the local relational database entry on the target system.

DDM and DRDA connection limitations

SQL applications can now access remote data containing large object data types (LOBs) of up to 2 gigabytes. This enhancement has placed a limitation on the number of concurrent Distributed Relational Database Architecture™ (DRDA®) or distributed data management (DDM) connections within a single job. When certain applications are run, you might see message CPF3E0A issued to the job log if the limit has been reached.

The circumvention is to reduce the number of open connections in the job. The job default is to leave connections from iSeries clients to iSeries servers open. The CL command CHGJOB DDMCNV(*DROP) can be used to cause DDM-allocated connections to be dropped when they are no longer used, such as when an application closes a DDM file, or when a DRDA application runs an SQL DISCONNECT statement. The Reclaim Distributed Data Management Conversations (RCLDDMCNV) CL command can also be used to end unused connections.

Before you restore the QUSRSYS library following V5R2 upgrade and migration

When you upgrade or migrate to V5R2 from a previous release, you should apply PTF SI08439 before you restore your QUSRSYS library. This fix prevents potential damage that can occur to the exit registration (*EXITRG) object QUSEXRGOBJ in library QUSRSYS when you restore the library.

Access path not saved when physical file has no records

In prior releases, access paths built over a physical file member that contained no records were saved when ACCPTH(*YES) was specified. In V5R2, access paths over a single physical file member with no records are not saved. This improves performance during save as the access path over an empty table is also empty.

Informational message CPI3203 will no longer be sent to the job log during a save operation for a file where the access path is not saved because the associated physical file member has no records.

If the file containing the access path is restored, the access path will be rebuilt, instead of being restored from the save media. Since the table is empty, the rebuild time is insignificant.

PTF adds additional error checking to the restore function

In V5R2, the program temporary fix (PTF) SI24174 adds additional error checking to the restore function. If you try to restore a device file in a job that already has the file open, the file will not be restored, and the following messages are sent:

- CPF0675 – Device file is in use.
- CPD3737 – Object not restored.

This additional error checking has also been added to the restore function in V5R3 via PTF SI22948 and in V5R4 via PTF SI23983.

Chapter 3. Options

This chapter describes changes to specific options of the OS/400 operating system.

Host Servers (Option 12)

In V5R2, OS/400 - Host Servers (option 12) is required to be installed to end the file server, database server, and iSeries NetServer. It provides support to create a list of jobs associated with the given server that are to be ended.

NetWare Enhanced Integration (Option 25)

In V5R1 and prior releases, Enhanced NetWare NLM could be loaded with /TCP flag to specify /TCP as a working protocol, or it could be loaded without it to work with IPX. Examples include the following:

```
LOAD SYS:AS4NW\AS4NW410.NLM /TCP
LOAD SYS:AS4NW\AS4NW410.NLM (IPX is used)
```

In V5R2, to maintain consistency with the operating system, if the NLM is loaded without /TCP, the default protocol for the NLM will be TCP instead of IPX. /TCP is used even when the /TCP flag wasn't specified. The /TCP flag continues to help to define a specific TCP port to use.

If you are currently using Enhanced NetWare with IPX to communicate to your NetWare servers, you can no longer access them beginning in V5R2. You will need to run TCP/IP. NetWare servers can run both IPX and TCP simultaneously, so you can configure TCP without migrating all of your network to TCP. Enhanced NetWare will communicate with the NetWare server using TCP only, but workstations running Novell client can still access the server using IPX as well as IP.

Qshell (Option 30)

In V5R2, the Java utilities were changed from built-in utilities to regular utilities. Qshell will not find the Java utilities if the /usr/bin directory has been removed from the PATH variable. Prior to V5R2, the Java utilities were always found because they were built-in utilities. Because the /usr/bin directory is in the default PATH variable, it needs to be explicitly removed for the Java utilities to not be found.

The method for debugging a Java program run from Qshell is different for V5R2. Prior to V5R2, you found the shell interpreter job and started a debug session on it because the Java built-in utilities were run in the shell interpreter job. In V5R2, you need to find the job that is started to run the Java utility and start the debug session on it. You can use the `set -j` command to have Qshell display a message with the name of the job started to run the utility.

For compatibility with other systems, the /bin object is created as a symbolic link to the /usr/bin directory. If there is an existing object named /bin, it is renamed /bin.prv when the Qshell option is installed. If /bin.prv already exists, the original /bin object is renamed /bin.prv.nnn, where nnn is a value between 001 and 999. If

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the rename operation is successful, informational message CPIB9C0 is issued to the job log and the history log, which gives the new object name for the original /bin object.

Directory Services (Option 32)

In V5R2, option 32 of OS/400 (Directory Services) has been removed. All of the associated LDAP (Lightweight Directory Access Protocol) function is part of the base OS/400 operating system instead of an option of OS/400. Users running V4R3 or V4R4 of Client Access Operations Navigator will not be able to work with Directory Services (LDAP) in OS/400.

Any library-qualified calls to LDAP application programming interface (API) program QGLDSSDD, which specified library QDIRSRV, will need to be changed to call QGLDSSDD in library QSYS. If you created a program in V4R3 or V4R4 that used LDAP API procedures, you will need to recreate the program on a V5R2 server to bind to the QGLDUAPI and QGLDCLNT service programs in library QSYS.

OS/400 Portable Application Solutions Environment (Option 33)

IBM recommends installing OS/400 Option 33 (OS/400 Portable Application Solutions Environment) on all V5R2 servers. OS/400 PASE was previously a priced feature of OS/400 that was only shipped when ordered. V5R2 makes OS/400 PASE support a no-charge part of the operating system that ships with every order. Some system software (such as the enhanced DNS server and the ILE C++ compiler) requires OS/400 PASE support.

64-bit OS/400 PASE applications must be built in the format required for AIX 5L™. 64-bit OS/400 PASE applications that ran on a prior release must be recompiled to run on V5R2. V5R2 OS/400 PASE incorporates technology from AIX 5L release 5.1. AIX® made changes to the 64-bit program model for AIX 5L that require recompilation of 64-bit applications from older releases. 32-bit applications from prior releases are supported without recompiling.

OS/400 PASE is changed in V5R2 to search the /QOpenSys file system if an absolute path name is specified to run an OS/400 PASE program or script, but the object is not found or not usable. This allows ported programs and scripts that expect utilities in directory /usr/bin to work using OS/400 PASE utilities in /QOpenSys/usr/bin. The /QOpenSys file system is not searched if the calling program has changed credentials using setuid or setgid, nor is it searched if OS/400 PASE environment variable PASE_EXEC_QOPENSYS is set to N.

V5R2 changes OS/400 PASE runtime functions that return user names and group names (getpwnam, getpwuid, getgrnam, and getgrgid) to return those names in lowercase. You can force user name and group name strings to be returned in uppercase (the way OS/400 stores them) by setting OS/400 PASE environment variable PASE_USRGRP_LOWERCASE to N.

V5R2 OS/400 PASE creates separate directories for every language and region combination when the corresponding OS/400 PASE locale is installed. Prior releases used symbolic links to directory /QOpenSys/usr/lib/nls/msg/en_US for message directories en_AU, en_GB, and en_ZA. If your application uses OS/400 PASE locale en_AU, en_GB, or en_ZA, you may need to add path names for directory en_US to the NLSPATH OS/400 PASE environment variable. Programs QP2SHELL and QP2TERM are enhanced in V5R2 to automatically add en_US to

the default search path for any English locale (except for Belgian English, which is packaged in a different OS/400 language feature).

In V5R2, OS/400 Option 33 installs only OS/400 PASE locale objects associated with the language features you install. Previously, all OS/400 PASE locales were available on any system that installed Option 33. You may need to order and install additional OS/400 language features if you need locales that are not included with the language features you normally install. The following table shows what locales are included with each language feature:

```
*CODE (not part of any language feature):
                BE_BY.UTF-8
                ET_EE.UTF-8
                UK_UA.UTF-8
                be_BY.ISO8859-5

       Language Feature 2903:
                LT_LT.UTF-8

       Language Feature 2904:
                LV_LV.UTF-8

       Language Feature 2905:
                VI_VN.UTF-8

       Language Feature 2909:
                EN_BE.UTF-8
                en_BE.8859-15

       Language Feature 2911:
                SL_SI.UTF-8
                sl_SI.ISO8859-2

       Language Feature 2912:
                HR_HR.UTF-8
                hr_HR.ISO8859-2

       Language Feature 2913:
                MK_MK.UTF-8
                mk_MK.ISO8859-5

       Language Feature 2914:
                SH_SP.UTF-8
                SH_YU.UTF-8
                SR_SP.UTF-8
                SR_YU.UTF-8
                sh_SP.ISO8859-2
                sh_YU.ISO8859-2
                sr_SP.ISO8859-5
                sr_YU.ISO8859-5

       Language Feature 2922:
                PT_PT.UTF-8
                pt_PT.8859-15
                pt_PT.IBM-1252
                pt_PT.ISO8859-1

       Language Feature 2923:
                NL_NL.UTF-8
                nl_NL.8859-15
                nl_NL.IBM-1252
                nl_NL.ISO8859-1

       Language Feature 2924:
                EN_AU.UTF-8         en_AU.8859-15
                EN_CA.UTF-8         en_CA.8859-15
```

```
          EN_GB.UTF-8         en_GB.8859-15
          EN_IE.UTF-8         en_GB.IBM-1252
          EN_IN.UTF-8         en_GB.ISO8859-1
          EN_NZ.UTF-8         en_IE.8859-15
          EN_US.UTF-8         en_IN.8859-15
          EN_ZA.UTF-8         en_NZ.8859-15
          HI_IN.UTF-8         en_US.8859-15
                              en_US.ISO8859-1
                              en_ZA.8859-15

Language Feature 2925:
          FI_FI.UTF-8
          fi_FI.8859-15
          fi_FI.IBM-1252
          fi_FI.ISO8859-1

Language Feature 2926:
          DA_DK.UTF-8
          da_DK.8859-15
          da_DK.ISO8859-1

Language Feature 2928:
          FR_FR.UTF-8
          fr_FR.8859-15
          fr_FR.IBM-1252
          fr_FR.ISO8859-1

Language Feature 2929:
          DE_AT.UTF-8
          DE_DE.UTF-8
          de_AT.8859-15
          de_DE.8859-15
          de_DE.IBM-1252
          de_DE.ISO8859-1

Language Feature 2931:
          CA_ES.UTF-8         ca_ES.8859-15
          ES_AR.UTF-8         ca_ES.IBM-1252
          ES_CL.UTF-8         ca_ES.ISO8859-1
          ES_CO.UTF-8         es_AR.8859-15
          ES_ES.UTF-8         es_CL.8859-15
          ES_MX.UTF-8         es_CO.8859-15
          ES_PE.UTF-8         es_ES.8859-15
          ES_PR.UTF-8         es_ES.IBM-1252
          ES_UY.UTF-8         es_ES.ISO8859-1
          ES_VE.UTF-8         es_MX.8859-15
                              es_PE.8859-15
                              es_PR.8859-15
                              es_UY.8859-15
                              es_VE.8859-15

Language Feature 2932:
          IT_IT.UTF-8
          it_IT.8859-15
          it_IT.IBM-1252
          it_IT.ISO8859-1

Language Feature 2933:
          NO_NO.UTF-8
          no_NO.8859-15
          no_NO.ISO8859-1

Language Feature 2937:
          SV_SE.UTF-8
          sv_SE.8859-15
          sv_SE.ISO8859-1
```

```
Language Feature 2939:
          DE_CH.UTF-8
          DE_LU.UTF-8
          de_CH.8859-15
          de_CH.ISO8859-1
          de_LU.8859-15

Language Feature 2940:
          FR_CH.UTF-8
          fr_CH.8859-15
          fr_CH.ISO8859-1

Language Feature 2942:
          IT_CH.UTF-8
          it_CH.8859-15

Language Feature 2954:
          AR_AA.UTF-8         ar_AA.ISO8859-6
          AR_AE.UTF-8         ar_AE.ISO8859-6
          AR_BH.UTF-8         ar_BH.ISO8859-6
          AR_EG.UTF-8         ar_EG.ISO8859-6
          AR_JO.UTF-8         ar_JO.ISO8859-6
          AR_KW.UTF-8         ar_KW.ISO8859-6
          AR_LB.UTF-8         ar_LB.ISO8859-6
          AR_OM.UTF-8         ar_OM.ISO8859-6
          AR_QA.UTF-8         ar_QA.ISO8859-6
          AR_SA.UTF-8         ar_SA.ISO8859-6
          AR_SY.UTF-8         ar_SY.ISO8859-6
          AR_TN.UTF-8         ar_TN.ISO8859-6

Language Feature 2956:
          TR_TR.UTF-8
          tr_TR.ISO8859-9

Language Feature 2957:
          EL_GR.UTF-8
          el_GR.ISO8859-7

Language Feature 2958:
          IS_IS.UTF-8
          is_IS.8859-15
          is_IS.ISO8859-1

Language Feature 2961:
          HE_IL.UTF-8
          iw_IL.ISO8859-8

Language Feature 2962:
          JA_JP.UTF-8
          Ja_JP.IBM-943
          ja_JP.IBM-eucJP

Language Feature 2963:
          NL_BE.UTF-8
          nl_BE.8859-15
          nl_BE.IBM-1252
          nl_BE.ISO8859-1

Language Feature 2966:
          FR_BE.UTF-8
          FR_LU.UTF-8
          fr_BE.8859-15
          fr_BE.IBM-1252
          fr_BE.ISO8859-1
          fr_LU.8859-15

Language Feature 2972:
```

```
          TH_TH.UTF-8
          th_TH.TIS-620

Language Feature 2974:
          BG_BG.UTF-8
          bg_BG.ISO8859-5

Language Feature 2975:
          CS_CZ.UTF-8
          cs_CZ.ISO8859-2

Language Feature 2976:
          HU_HU.UTF-8
          hu_HU.ISO8859-2

Language Feature 2978:
          PL_PL.UTF-8
          pl_PL.ISO8859-2

Language Feature 2979:
          RU_RU.UTF-8
          ru_RU.ISO8859-5

Language Feature 2980:
          PT_BR.UTF-8
          pt_BR.8859-15
          pt_BR.ISO8859-1

Language Feature 2981:
          FR_CA.UTF-8
          fr_CA.8859-15
          fr_CA.ISO8859-1

Language Feature 2986:
          KO_KR.UTF-8
          ko_KR.IBM-eucKR

Language Feature 2987:
          ZH_TW.UTF-8
          Zh_TW.big5
          zh_TW.IBM-eucTW

Language Feature 2989:
          ZH_CN.UTF-8
          Zh_CN.GBK
          zh_CN.IBM-eucCN

Language Feature 2992:
          RO_RO.UTF-8
          ro_RO.ISO8859-2

Language Feature 2994:
          SK_SK.UTF-8
          sk_SK.ISO8859-2

Language Feature 2995:
          SQ_AL.UTF-8
          sq_AL.8859-15
          sq_AL.ISO8859-1
```

Other OS/400 PASE changes

V5R2 changes the way the Qp2RunPase API reports that a core file was produced for signal termination of an OS/400 PASE program. Using the WTERMSIG macro on the function result from the API used to return a value that included the signal

number, and also set bit flag X'80' if a core file was created. Applying the WTERMSIG macro to the API result in V5R2 returns just the signal number. The high-order bit of the four-byte API result (0x80000000) is set if a core file was created.

International Components for Unicode (Option 39)

In V5R2, option 39 will ship more than 1 version of the ICU APIs. The default system support will be to call the most recent version of the ICU APIs. This means the ICU 2.0 APIs will be used rather than the 1.6 version. This may result in a different result to the caller.

Batch Journal Caching PRPQ P84486 (5799-BJC) and HA Journal Performance (Option 42)

If you currently use the Batch Journal Caching PRPQ P84486 (5799-BJC) on a previous release, you can continue to use it on V5R2.

In V5R2, Journal Caching and a new Journal Standby function are combined into a new, OS/400 Option 42 (HA Journal Performance). Customers who currently have the PRPQ can continue to use it ″as is″ and do not have to upgrade to Option 42. In addition to wanting to take advantage of the new functions, customers may want to consider upgrading since the PRPQ may not be supported on future releases. The charges to upgrade from the PRPQ to the tier-priced Option 42 are approximately 20% of the feature full price to reduce the cost for customers who have already purchased the PRPQ.

The following lists the additional functions in Option 42 compared to the PRPQ:

- **Expanded Journal Caching Function**. Journal entries will be cached for the following journaled objects:
  - Data areas
  - Data queues
  - Integrated File System objects (stream files, directories, and symbolic links)
- **Journal Standby Function**. Journal standby state prevents most journal entries from being entered into the journal. You might want to put a journal in standby state if the journal is on a backup system. This can give you the following advantages:
  - Eliminate the processing overhead of journaling the objects on the backup system while in standby state
  - Reduce switchover time by having journaling already started for the objects on the backup system

  Note: When a journal is in standby state, you cannot use commitment control either explicitly or implicitly (for example, when using referential constraints).

Chapter 4. Licensed programs

This chapter contains information about individual licensed programs that have been modified or changed for V5R2.

iSeries supported products for V5R2

To find out the most current status of supported products and features for iSeries products, go to the following Web site:

`http://www.ibm.com/servers/eserver/iseries/support/planning/nav.html`

This site provides information on iSeries products or features that may not be supported in future releases of the OS/400 operating system or on future iSeries models, Product Previews, and Statements of Directions. It is intended to provide advanced planning guidance for iSeries customers. You may choose to use this information to plan your replacement solutions as you upgrade your systems to newer releases or models.

The information on this site provides insight into IBM's current plans and directions and is subject to change or withdrawal without notice and may contain errors or omissions.

Backup, Recovery and Media Services for iSeries (5722-BR1)

The following changes were made to the Restore Authority Using BRM (RSTAUTBRM) command:

- The USRPRF parameter was removed.
- The USRASP parameter value was changed from 2-99 to 2-32, and the *NONE special value was removed.
- The RSTAUTBRM command no longer replaces RSTAUT; rather, it can be used in addition to the RSTAUT command.

The OMITASP parameter of the Save System Using BRM (SAVSYSBRM) command was removed. (It was added at V5R1 for consistency with the SAVSYS command.)

Installation time for BRMS

If the size of the QUSRBRM library on your server is large, you could experience long installation times when upgrading BRMS to V5R2. This is because of the conversion of the physical files in the QUSRBRM library to a new file format. The benefits of this conversion are:

- More storage available on your system
- Shorter save times when saving the user libraries on your system
- Less time to save the BRMS media information after each backup

The following is a summary of the install time when performing a BRMS upgrade from V5R1 to V5R2 where the size of the QUSRBRM library before the installation was 27 gigabytes consisting of 8,570,000 records.

```
*PGM installation time 00:01:51
*LNG installation time 01:00:06
```

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QUSRBRM storage size after installation was 7.6 gigabytes. The physical file conversion rate for the above installation was approximately 175,000 records per minute.

The physical file conversion occurs during the post processing phase of the primary language install. The time required to convert the files in library QUSRBRM will vary depending on the system model, storage configuration, number of active jobs, and number of records in the physical files in the QUSRBRM library. If the size of the QUSRBRM library on your system is significantly larger than the example above, you need to plan for the extended installation time.

You should estimate the conversion time to plan for your upgrade of BRMS to V5R2. The best conversion performance can be achieved with little or no other system activity on the system when you upgrade BRMS. You can obtain an estimate of the conversion time by running the steps of the following procedure. For more precise estimates, always run this command in the same system environment used to install BRMS.

1. If you are upgrading from V5R1 and have BRMS PTF SI08485 installed, run the following command to determine the estimated conversion time.

   ```
   CALL  QBRM/Q1ARMLT  PARM('ESTCONVTIM')
   ```

   Review the job log or the BRMS log for the following message:

   ```
   BRM402B: ESTIMATED CONVERSION TIME IS nn HOURS AND nn MINUTES.
   ```

   Otherwise, complete steps 2 through 8 to determine the estimated conversion time for your system.
2. Use the Display File Description (DSPFD) command to determine the ″Current number of records″ and the ″Number of deleted records″ for these files in the QUSRBRM library:
   - QA1ADI
   - QA1ADI2
   - QA1AHS
   - QA1AHH
   - QA1ALI
   - QA1ALI2
   - QA1AMB
   - QA1AOD
   - QA1AOQ
3. If the ″Number of deleted records″ for any file is large, then use the Reorganize Physical File Member (RGZPFM) command to remove the deleted records before completing the remaining steps.
4. From a command line, use the following command to create a duplicate of one of the larger files listed above to the QTEMP library.

   ```
   CRTDUPOBJ OBJ(QA1ALI) FROMLIB(QUSRBRM) OBJTYPE(*FILE)
      TOLIB(QTEMP) DATA(*YES)
   ```
5. Review the job log to determine the time (in minutes) required to complete the file duplication.
6. Divide the number of records in the file by the duplication time to determine the number of records duplicated per minute.
7. Calculate the total number of records by summing the ″Current number of records″ for each of the files listed in step 2 above.

8. Determine the approximate conversion time by dividing the total number of records (from step 7) by the number of records duplicated per minute (from step 6).

To ensure that BRMS functions correctly after you complete the installation, load and apply PTF SI04321 to 5722-BR1.

Performance Tools for iSeries (5722-PT1)

BEST/1 withdrawn

BEST/1 is being withdrawn from the Performance Tools effective with this release. Alternatives that you might consider for sizing your capacity requirements include, but may not be limited to, the IBM Workload Estimator (integrated with PM/400) and the BMC product, PATROL® for iSeries (AS/400) – Predict.

Support for the following commands is withdrawn from the Performance Tools licensed program effective with V5R2:

STRBEST (Start BEST/1)
ANZBESTMDL (Analyze BEST/1 Model)
CRTBESTMDL (Create BEST/1 Model)
CVTMDLSYSF (Convert MDLSYS File)
DLTBESTMDL (Delete BEST/1 Model)
PRTBESTF (Print BEST/1 File)
QCYCHKV (Check Version of Specified Performance Data Member)
QCYCVTBD (Convert S/36 Files from MDLSYS to BEST/1)
QCYFLDT (Find First and Last Date of Specified Perf Data Member)
QCYRSNDM (Receive Msgs from Previous Layer and Resend to Invoking Layer)
MDLSYS (Start MDLSYS)

All displays, files, programs, and messages related to BEST/1 are deleted.

Recommended replacement for BEST/1 is BMC PATROL for iSeries – Predict

Starting with V5R2, BMC PATROL for iSeries - Predict provides performance analysis and capacity planning support and is the recommended performance tool for Models 800, 810, 825, 870, and 890. To get the most current information on BMC PATROL for iSeries - Predict , refer to the BMC software Web site:

www.bmc.com/

Select the link for products and services.

Print Performance Explorer Report command changes

The public authority for the Print Performance Explorer Report (PRTPEXRPT) command is changed from *USE to *EXCLUDE.

To use PRTPEXRPT, you must now have either *SERVICE special authority or be authorized to the Service Trace function of Operating System/400 through iSeries Navigator's Application Administration support. The Change Function Usage Information (QSYCHFUI) API, with a function ID of QIBM_SERVICE_TRACE, can also be used to change the list of users that are allowed to perform trace operations.

Content Manager OnDemand for iSeries (5722-RD1)

Values for LGLREL parameter of FNDKEYOND command changed

In V5R1, the Find Key for OnDemand (FNDKEYOND) command has the values *AND and *NO for the Logical relationship (LGLREL) parameter.

In V5R2, *OR was added as a valid value and *NO was removed from the list of valid values. If you had coded LGLREL(*NO) for the FNDKEYOND command, you will need to change the command string to specify LGLREL(*OR).

DB2 DataPropagator for iSeries, V8.1 (5722-DP4)

Control tables for Capture and Apply programs

When using 5722-DP4 in an independent auxiliary storage pool (ASP) environment, you have a choice of creating the control tables for the Capture and Apply programs either in the base ASP or in independent ASP groups. Creation of the control tables in both the base ASP and the independent ASP is not supported. If you choose to create control tables in an independent ASP group, you must remove all Capture and Apply control tables from the base ASP first. Source tables and journals referred to by these control tables must be in the same base ASP or independent ASP group as the control tables.

Migration from an earlier release of DataPropagator

If you are using a previous version of DB2 DataPropagator™ for iSeries (either 5769-DP2 or 5769-DP3), you can upgrade your operating system to V5R2, including the installation of 5722-DP4, without affecting your existing replication environment. Operating an earlier version of DataPropagator on iSeries or other supported platforms in conjunction with the new version is also supported.

To upgrade your existing replication environment to support this compatibility mode, a PTF is available for 5769-DP3, and a save file is available from your service provider for 5769-DP2. The new release, 5722-DP4, will remain unusable as long as the previous version exists on your system. At a convenient time, you can use the migration tool to migrate your replication environment to the new release. At the completion of the migration process, the new release will become usable, and the previous release will be removed from your server.

Earlier releases of DataPropagator for iSeries can be used in V5R2 for a short time to allow you to choose your own date for migrating to 5722-DP4. However, there will be no PTF support for these earlier releases in V5R2, so you are encouraged to migrate as soon as possible.

For information about migrating to DB2 DataPropagator for iSeries, Version 8, including software prerequisites and coexistence of product versions, refer to the migration information on the DB2 DataPropagator Product documentation page:
`www.ibm.com/software/data/dpropr/library.html`

DB2 Universal Database™ Extenders for iSeries V7.2 (5722-DE1)

During a software upgrade, files within QSYS2 and QSYS are deleted and re-created. Any views that are created over those files are also deleted. Therefore, Option 1 (Text Extender for iSeries) views need to be re-created after the upgrade.

1. Delete the Text Extender views manually by using an interactive SQL session with an SQL naming convention. One or more of the views might not exist. Ignore any corresponding `File not found` messages.

```
STRSQL NAMING(*SQL)
drop view db2tx.textcolumns
drop view db2tx.textindexes
drop view db2tx.columnindex
drop view db2tx.tableindex
drop view db2tx.tables
drop view db2tx.columns
drop view db2tx.functions
drop view db2tx.funcparms

leave SQL session
```

2. Re-create the Text Extender views:

```
SBMJOB CMD(RUNSQLSTM SRCFILE(QDB2TX/QADESDDL)
       SRCMBR(DESCVIEW) NAMING(*SQL))
       JOB(TECRTVIEW) USER(QDESADM)
```

   Check the DESCVIEW (user QDESADM) spooled file for successful completion.

XML-enabled columns must be migrated

Because the XML column storage method has been enhanced in V5R2, schemas that contain columns enabled for XML in V5R1 must be migrated.

To migrate database files that contain XML columns, use the migration program available with PTF 5722DE1 V5R2M0 SI05666 to migrate your columns automatically or use the following steps for each enabled column after V5R2 installation of the XML Extender product.

Before you begin: Retrieve the DAD files used to enable the columns in this database; the DAD file is stored in the DB2XML.XML_USAGE table. See the DB2 UDB Extenders for iSeries XML Extender Administration and Programming Version 7.2 documentation for detailed information about completing XML Extender enablement steps.

1. Use SAVOBJ to save the data in the side tables.
2. Disable the XML column by using one of the methods described in the DB2 XML Extender documentation.
3. Enable the XML column by using one of the methods described in the DB2 XML Extender documentation.
4. Use RSTOBJ to restore the data to the side tables. If your side tables have long names, you must first drop the side tables before restoring them.
5. Re-create any indexes.

IBM HTTP Server for iSeries (5722-DG1)

Prior to V5R2, the HTTP Server for iSeries (powered by Apache) was based on version 2.0.18 of the Apache Software Foundation's HTTP server. In V5R2, the HTTP Server is based on the Generally Available (GA) version of Apache 2.0. However, Apache 2.0 GA introduced changes that are not fully compatible. This means that server configurations or Apache user modules that were written based on Apache 2.0.18 may require modification when V5R2 is installed. If you had previously configured IBM HTTP Server (powered by Apache), configuration changes may be required when you install V5R2. For further details on HTTP server compatibility, refer to the following Web site:

www.ibm.com/servers/eserver/iseries/software/http/product/compatibility.html

Port directive was removed

The port directive is no longer supported in Apache configuration files; you should use the listen directive instead. If you used the HTTP Server configuration and administration GUI to create and configure Apache servers, there is no impact. If you updated Apache configuration files by directly editing the Apache configuration file, you will need to analyze your configurations. The Apache server will not start if the port directive is found in the configuration file. Job log message HTP803C will indicate that the port directive must be changed to listen.

SuffixCaseSense directive valid only at server context

The SuffixCaseSense directive is now valid only at server context. If it was configured in a container (for example, a directory container), you must change the configuration. If SuffixCaseSense is found anywhere other than the server configuration context, diagnostic message HTP8012 will be sent to the HTTP Server job log and the server will not start.

HTTP Server Administration interface enhanced

In V5R2, the IBM HTTP Server Administration interface is changed significantly. The GUI for HTTP Server Administration is modified to meet accessibility requirements and to be more usable. Both appearance and navigation through the HTTP graphical user interface are significantly different in this release. The changes required for accessibility span the entire GUI interface. The changes for usability are being focused on improving general navigation and usability when administering and configuring the IBM HTTP Server Powered by Apache.

HTTP Server compatibility with Java CGI programs

The HTTP Server product will continue to support Java Common Gateway Interface (CGI) programs using JDK 1.1 only. JDK 1.1 continues to ship with OS/400 in V5R2. However, there are no plans to update the Java CGI support to use a later JDK level. If, in a future release, JDK 1.1 is no longer shipped with OS/400, the HTTP server product will no longer support Java CGI. If you have Java CGI applications, you should migrate those applications to Java servlets using WebSphere Application Server or the integrated ASF Tomcat servlet engine.

Proxy serving on HTTP Server

If you had previously configured IBM HTTP Server (powered by Apache) to perform proxy serving, a configuration change is required when you install V5R2. The new version of Apache 2.0 introduces two new container directives called <Proxy> and <ProxyMatch>. In the past, proxy directives were enclosed in a <directory> container. However, in V5R2, the directives specific to the proxy configuration will need to be enclosed in an Apache 2.0 <proxy> container to take effect.

User-written modules must be recompiled in V5R2

The Apache APIs have changed between Apache 2.0.18 beta (shipped on V4R5 and V5R1) and the version of Apache shipping with V5R2. Some API calls have changed (modified parameter list) and the structures defined by the Apache Software Foundation have changed (added fields, redefined fields, renamed fields, and so on). An Apache user-written module that was compiled with the 2.0.18 header files will need to be recompiled using the new header files shipped in V5R2.

iSeries Access for Windows (5722-XE1)

iSeries Access for Windows does not support Windows 95

The V5R2 version of iSeries Access for Windows (previously named Client Access Express) no longer supports the Windows 95 operating system. Be aware that if you are using Check Version to keep your PCs running Client Access Express at the latest level, you could have a problem if you are using Windows 95. If those PCs are automatically upgraded to V5R2 iSeries Access for Windows, you may no longer be able to make connections. Upgrading TCP/IP on the PC (moving from Winsock 1.1 to Winsock 2.0 or later) may resolve this problem, but it will still be an unsupported environment.

MAPI support removed

The V5R2 version of iSeries Access for Windows does not include the MAPI component, which was a set of interfaces for accessing some types of mail. If you are upgrading from an earlier version, the MAPI component will be uninstalled from your PC.

Connection errors from V5R1 clients connecting to V5R2 servers

If you are using a V5R1 client to connect to an iSeries server at V5R2 and receive an error, you need to install the latest Client Access Express service pack on the client system. This problem occurs any time the Remote Command server is required, including all iSeries Navigator use. This affects only V5R1 clients that are accessing a V5R2 iSeries server.

Data Access methods that use cursors may experience changed behavior

This applies to data access methods provided by iSeries Access for Windows, including OLE DB, ODBC, and JDBC.

When a cursor is opened with one of these data access methods, the calling application can request a cursor type, such as Static, Dynamic, or ForwardOnly. Prior to iSeries Access for Windows version V5R2, however, there was no way to specify the cursor sensitivity. Cursor sensitivity is an attribute that indicates whether changes made to the base rows used to build the cursor are visible *within* the open cursor, *are not* visible, or *may or may not* be visible, depending upon the iSeries host algorithms that are used to perform the query.

Prior to V5R2 of the iSeries host, there was no way to specify the cursor sensitivity, so the cursor behavior was undefined and could not be guaranteed. Starting with version V5R2, the internal iSeries host algorithms used to return record sets to the client application have changed, and make it more likely that an application may not get the same behavior as when working with previous releases of the iSeries host. Because of this, applications that depend on a certain cursor sensitivity should be examined to see if changes are required.

Starting with iSeries Access for Windows version V5R2, the data access methods have implemented a way for applications to specify cursor sensitivity. For detailed information on this, see Information APAR II13280.

Two names for ODBC driver

In V5R2, iSeries Access for Windows registers two ODBC driver names: *Client Access ODBC Driver (32-bit)* and *iSeries Access ODBC Driver*. There is still only one ODBC driver, but there are now two names for it. As a result of this change, ODBC DSNs (Data Sources) that you create in V5R2 that use the new name of *iSeries Access ODBC Driver* will not be usable by previous versions of Client Access ODBC. This would cause a problem if you create a DSN on V5R2, and then uninstall V5R2 iSeries Access for Windows and install an older version of Client Access Express. To work around this issue, use a tool called `CWBODBCREG`, which is available in the first service pack of V5R2 iSeries Access for Windows, and also at the following FTP site:

`ftp://ftp.software.ibm.com/as400/products/clientaccess/win32/files/odbc_tool/`

iSeries Access for Windows and IBM Personal Communications coexistence

If you are using both V5R2 iSeries Access for Windows and the IBM Personal Communications (PCOMM) products, PCOMM needs to be at version 5.5 with CSD1 or later in order to coexist with V5R2 iSeries Access for Windows.

Since Operations Console is a component of iSeries Access for Windows, V5R2 Operations Console users who have coexisting PCOMM should also be aware of this requirement for PCOMM version 5.5 with CSD1 or later.

iSeries Navigator changes

System File menu and System Context menu changes

The System File menu and System Context menu for iSeries Navigator have been reorganized for V5R2 to improve the usability of the menus. All V5R1 menu items are still present, but the logical order and grouping of several items have been changed.

On the System File menu, **Add Connection...**, **Environments...**, **Create Desktop Icon**, **Verify Connection...**, **Delete...**, and **Change Password...** have been moved within the new **Connection to Server** cascading menu. **Selective Setup** and **Install Plug-ins** also have been moved within the new **Connection to Server** cascading menu.

A new cascading menu for **Application Administration** is provided for any direct-connect system that is an Administration System in V5R2, which results in new **Local Settings** and **Central Settings** menu items; otherwise, **Application Administration** remains unchanged and is not a cascading menu. Also, the **System Status** menu option is new for V5R2. Some of the remaining menu items have been reordered and regrouped.

On the System Context menu, **Create Desktop Icon**, **Verify Connection...**, **Delete...**, and **Change Password...** have been moved within the new **Connection to Server** cascading menu. A new cascading menu for **Application Administration** is provided for any direct-connect system that is an Administration System in V5R2, which results in new **Local Settings** and **Central Settings** menu items; otherwise, **Application Administration** remains unchanged and is not a cascading menu. Also, the **System Status** menu option is new for V5R2. Some of the remaining menu items have been reordered and regrouped.

Sending a user or group to system from a previous release

In V5R1, iSeries Navigator added the capability to send a user or group from an iSeries server or AS/400 system running V5R1 to one or more iSeries or AS/400 servers running V5R1. For V5R2, iSeries Navigator can send a user or group from a system running V5R2 to systems running either V5R2 or V5R1. If you send a user or group to a target system which is at a prior release from the source system (for example, the source system is V5R2 and the target system is V5R1), session-related information associated with the user (for example, the last source file the user edited using Source Entry Utility) is not sent. This session-related information is, however, sent to target systems of the same or newer release from the source system.

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iSeries
Memorandum to Users
Version 5 Release 2 (June 2006 Update)

Overall, how satisfied are you with the information in this book?

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Overall satisfaction	☐	☐	☐	☐	☐

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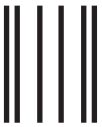

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