



OBJAUDIT

iSeries Object Auditing Facility

Version 1 Release 0

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iSeries Object Auditing Facility

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Version 1 Release 0 Modification 2

This edition applies to Version 1 Release 0, Modification 2 of the Object Auditing Facility

Unless otherwise stated, all pages in this edition are to Version 1.0.2 and refer to the iSeries Operating System i/OS, Version 7.3 or greater.

Any references in this manual to Navan Utilities or NUTIL refer to standard Navan Utility products.

Most functions in this facility will work without the NUTIL program product being installed. Any product restrictions or limitations that do exist (where NUTIL is not installed on the same machine) are documented in this manual.

Information on these products can be obtained from your nearest Navan agent.

Object Auditing Facility - An introduction

The Object Auditing Facility was created as a means of keeping track of where all of your disk space is being used. Also, when it all seems to have disappeared, you can use the facility to track down the culprits.

As supplied it can provide a lot of meaningful information that you can start to use, and act upon, straight away. As an added extra you are provided with all source code for the facility, so you can build in your own corporate requirements.

The facility has 3 functional areas:

1. Building the object auditing database, which takes a snapshot of your system
 2. Reporting functions that read the data in the audit database and print standard exception reports
 3. Cleaning utilities, to act on the information in the auditing database.
-

Installation Procedures

Please read this section of the document thoroughly before commencing the installation.

General

All steps in this installation procedure must be performed using the System Security Officer user profile, or by using a user profile assigned *ALLOBJ special authority.

Certain programs in the Object Auditing Facility adopt authority when in use. This authority adoption must be retained if the system is to operate as intended.

Prerequisites

As supplied, the utility expects to be able to use objects from the NUTIL (Navan Utilities) program product. This is to ensure the latest versions of callable utility procedures are used, rather than the ones supplied in this utility.

However, with minor program modifications, this dependency can be removed.

Installing the Object Auditing Facility

The downloaded product is a complete replacement product; if you already have the facility installed on your iSeries you must first delete the old OBJAUDLIB library before installing (restoring) the new version on to your machine.

To install the Object Auditing Facility, you must have the file OBJAUD.EXE on your LAN or local hard drive.

From Explorer or File Manager, double-click on the .EXE file to unpack the following files:

- 1: OBJAUD.SAV The Object Auditing Facility program product
- 2: Any other release specific documentation

For the remainder of this procedure, you must be signed on to your iSeries with the user profile of QSECOFR, or a user profile with object management rights. After verifying that you are signed on as QSECOFR, create a save file QGPL/OBJAUD on your iSeries. This file will only be used temporarily for the installation process. To create the file, use the following command:

```
CRTSAVF QGPL/OBJAUD
```

The OBJAUD.SAV file must now be uploaded to your iSeries. It should be uploaded to save file OBJAUD which you just created in the previous step. We prefer using FTP to transfer the file. However, you can use any method with which you are comfortable. If you wish to FTP the file, open a DOS command window on your Windows PC and type the following:

```
FTP ip-address-or-host-name-of-your-iSeries
your-username (when prompted for it)
your-password (when prompted for it)

BIN

PUT pc-dir\OBJAUD.SAV QGPL/OBJAUD

CLOSE
QUIT
EXIT
```

Now go back to your iSeries workstation session (signed on as security officer, or user with *ALLOBJ authority!) and restore the Object Auditing Facility product library:

```
RSTLIB SAVLIB (OBJAUDLIB) DEV (*SAVF) SAVF (QGPL/OBJAUD) OUTPUT (*PRINT)
```

Once that has completed, the product is installed and ready for use.

The Object Audit Facility in use

All Object Auditing functions can be accessed by the menu provided:

```
ADDLIBLE OBJAUDLIB
GO AUDMNU
```

```
AUDMNU                Object Audit Facility menu                System: NAVAN

Select one of the following:

    1. Generate the object auditing database                AUD001
    2. Run the audit reports                                AUD003

    11. Cleanse (remove) old objects                        AUDCLNOBJ
    12. Move user objects to user libraries                MOVUSROBJ

    21. Compress unused objects                            AUD101
    22. Reorganize database files                          AUD102
    23. Reclaim unused storage                             AUD103

    31. Print the user profile audit reports                AUD201
    32. Print the DLO document audit reports                AUD202
    41. Print job description key information                AUD091

    51. Change job description logging levels                CHGJOBLOG

Other options
    90. Sign off

Selection or command
===>

F3=Exit   F4=Prompt   F6=DSPMSG   F9=Retrieve   F12=Cancel   F14=WRKSBJOB
F18=WRKSPLF

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```

The Object Auditing Database must have been generated (by using menu option 1) before any of the other menu options will work.

Please note that batch jobs are always submitted from this menu in STATUS(*HELD); you must manually release the job before it will start processing.

Building the Object Audit database

Taking option 1 from the menu will build the main audit database for your system.

Depending on the size of your system, this can take a long time and it is suggested that the processing be performed when there is little activity on your machine.

The files built (in the OBJAUDLIB library) are:

- @DSPOBJD - a list of all user objects on your machine
- @DSPMBRLST - a list of physical database files on your machine
- @DSPSRCF - a list of physical source files on your machine

Based on these files, you can then take the other options on the menu to print reports or process the objects.

Note that the files do not contain references to *all* objects on your machine, only ones that the auditing facility is interested in.

Printing the audit reports

Option 2 from the menu prints the audit reports, as follows:

<i>Report name</i>	<i>Query name</i>	<i>Description</i>
LIBSIZES	LIBSIZES	A summary total of object exceptions, by library
OBJTOT	OBJTOT	Object totals, by object type
FILEEXC	FILEEXC	Database file exceptions
PGMEXC	PGMEXC	Program object exceptions
FILEEXCP	FILEEXCP	Display/Printer file exceptions
FILEEXCS	FILEEXCS	'Special' file (DDMF, CMNF, etc) exceptions
MSCOBJEXC	MSCOBJEXC	Miscellaneous object type (MSGF, PNLGRP, etc) exceptions
LSTDFU	LSTDFU	A list of DFU (Data File Utility) objects found
LSTQRY	LSTQRY	A list of query definitions found
LSTMSGQ	LSTMSGQ	A list of message queues found
LSTSAVF	LSTSAVF	A list of savefiles found
LSTJRNOBJ	LSTJRNOBJ	A list of journals and receivers found
LSTSRCF	LSTSRCF	A list of source physical files found
DUPOBJECTS	DUPOBJECTS	A list of possible duplicated objects
CPYOBJECTS	CPYOBJECTS	A list of possibly copied objects
SRCOBJEXCP	SRCOBJEXCP	A list of source/object exceptions (potential mismatches)
OBJNOUSE	OBJNOUSE	A list of objects that haven't been used since a specified date
USROBJS	USROBJS	A list of user objects owned by users

The audit reports are processed using standard Query definitions included in the OBJAUDLIB library. These definitions can be manipulated using the IBM WRKQRY (Work with Query Definitions) command. For more details on using the IBM Query product refer to the *IBM Query for iSeries* manual.

Note that not all reports may be useful to your installation; this is a collection that has been built up over a period of time using different installations and installation types. As an example, the USROBJS list can help to show where users have created physical files from using the IBM Query product - these files are usually of a temporary nature and can be considered likely candidates for removal.

Removing old/unused objects from user applications

Option 11 on the menu provides a function that can generically move, or remove, old objects from user libraries. This is very powerful and dangerous function and should be used with extreme caution. The program will only allow QSECOFR, or a user with *ALLOBJ authority, to use the command.

```

                                Cleanse old objects (AUDCLNOBJ)

Type choices, press Enter.

User Library to process . . . . LIB
Object type . . . . . OBJTYPE          *ALL
Object attribute . . . . . OBJATT       *ALL
Number of months to keep . . . . CLNMTHS
Cleanse option . . . . . CLNOPT         *ARCHIVE
Archive library . . . . . ARCLIB        OBJAUDARC

```

The command works against the @DSPOBJD database data to make decisions about which user objects are eligible to be processed by this command.

Command parameters:

LIB - This parameter defines which user library is to be selected.

OBJTYPE - This specifies the object type, within the specified user library) that is to be considered for processing. An entry of *ALL will ignore object type selection.

OBJATT - this specifies the object attribute (related to the specified object type) that is to be considered for processing. An entry of *ALL will ignore object attribute selection.

CLNMTHS - Specifies the number of months to subtract from the current date, to determine a *cleanse date*. Objects that have not been used since this calculated cleanse date will be considered for processing.

CLNOPT - Specifies the action to perform on selected user objects. An entry of *ARCHIVE will move the selected objects in to a specified archive library. An entry of *REMOVE will delete the selected objects and *should only be used in extreme circumstances*.

ARCLIB - If you specified CLNOPT(*ARCHIVE), this parameter specifies the name of the library which will hold the moved objects. If the specified library exists it will be used; if the library does not exist it will be created.

We cannot stress enough the danger of using CLNOPT(*REMOVE) - please use it with caution. If you archive the object you have the later possibility of moving it back again; if you delete it you are totally reliant upon offline storage for the same recovery.

Command limitations:

Please note that the CLNOPT(*REMOVE) feature can only be used if NUTIL is installed on your machine.

Moving user objects to user libraries

Quite often the use of the IBM query product can get out of hand; users are allowed to create database 'work' files that tend to be left on the system regardless of whether they are still required or not.

Similarly, users are not normally interested in which library they create these work files. This command is designed to allow you to selectively move this type of 'user created' object into libraries that are more appropriate for such transitory objects.

```
Move User objects (MOVUSROBJ)
```

```
Type choices, press Enter.
```

```
Library to process . . . . . LIB
Process objects created by . . . CRTUSER
Object type . . . . . OBJTYPE          *ALL
Object attribute . . . . . OBJATT       *ALL
Move to user library . . . . . USRLIB   *USRDFE
```

The command works against the @DSPOBJD database data to make decisions about which user objects are eligible to be processed by this command.

Command parameters:

LIB - This parameter defines which library (where the objects currently reside) is to be selected.

CRTUSER - This specifies the user profile name (that created the objects) to be processed.

OBJTYPE - This specifies the object type, within the specified user library) that is to be considered for processing. An entry of *ALL will ignore object type selection.

OBJATT - this specifies the object attribute (related to the specified object type) that is to be considered for processing. An entry of *ALL will ignore object attribute selection.

USRLIB - This specifies the name of the target library, to where the selected objects will be moved. An entry of *USRPRF specifies that the library name is the same as the user profile name. If the specified library exists it will be used; if the library does not exist it will be created.

Compress unused objects

Menu option 21 submits a job that will attempt to compress the object size of any user object that has not been accessed in the last 90 days. It does this by using the IBM command CPROBJ (Compress object).

A compressed object takes less storage space on the disk. If accessed by a user the system will automatically perform a temporary decompression of the object to allow it to be used. If the object is accessed often enough the system will permanently decompress the object.

For more details on the IBM CPROBJ command, refer to the IBM CL Reference manual.

Reorganize database files

Menu option 22 submits a job that will attempt to remove deleted records from any user physical file, where the deleted record count is greater than 10% of the total record count. It does this by using the IBM command RGZPFM (Reorganize physical file member).

When a record is deleted from a physical file, the actual storage space taken up by the record data is not deleted - it is only marked as 'deleted'. The RGZPFM command removes this 'deleted record' space from the file, in effect compressing the file member.

The procedure works against the @DSPMBRLST database data to make decisions about which user objects are eligible to be processed.

In the case of a multi-member file, each member within the file is processed individually. Only data files are processed; source physical files are not accessed by this procedure.

For more details on the IBM RGZPFM command, refer to the IBM CL Reference manual.

Once all processing has been performed, the @DSPMBRLST database data is rebuilt to reflect the new (current) information about the user physical database files.

Reclaim unused storage space

Menu option 23 submits a job that will attempt to reclaim any temporary storage space currently allocated by the system. It does this by using the following IBM commands:

RCLSPLSTG	Reclaim spool storage
RCLTMPSTG	Reclaim temporary storage

Normally this processing is performed at IPL (system startup) time; as such this processing is only really useful if you do not IPL regularly.

For more details on these IBM commands, refer to the IBM CL Reference manual.

Additional processing performed is as follows:

- The QRPLOBJ library is cleared. This is a system library that stores replaced versions of newly compiled objects - when you specify REPLACE(*YES) on an object creation command (such as create program), the replaced object is moved in to this library (with a system assigned name). QRPLOBJ normally gets cleared at IPL time.
 - The NUTIL command RGZFILES is used to reorganize (compress) the database files in the QUSRSYS library. If you do not have the NUTIL program product on your machine, this step is not performed.
-

Print the user profile audit reports

Menu option 31 will interrogate the user profiles defined on your system and produce additional audit reports about them.

The files built (in the OBJAUDLIB library) are:

@DSPUSRPRF - a list of user profiles on your system

The audit reports generated are as follows:

<i>Report name</i>	<i>Query name</i>	<i>Description</i>
AUDUSRPRF1	AUDUSRPRF1	List of user profiles, by least used (descending 'last signon')
AUDUSRPRF2	AUDUSRPRF2	List of user profiles, by storage usage
AUDUSRPRF2	AUDUSRPRF3	List of user profiles with special authorities defined

The audit reports are processed using standard Query definitions included in the OBJAUDLIB library. These definitions can be manipulated using the IBM WRKQRY (Work with Query Definitions) command. For more details on using the IBM Query product refer to the *iSeries Query Use* manual.

Print the DLO document audit reports

Menu option 32 will interrogate all document library objects defined on your system and produce additional audit reports about them.

The files built (in the OBJAUDLIB library) are:

@DOCLIST - a list of document library objects on your system

The audit reports generated are as follows:

<i>Report name</i>	<i>Query name</i>	<i>Description</i>
DOCLIST	DOCEXC	DLO document exceptions list (not used in 3 months)

The audit reports are processed using standard Query definitions included in the OBJAUDLIB library. These definitions can be manipulated using the IBM WRKQRY (Work with Query Definitions) command. For more details on using the IBM Query product refer to the *iSeries Query Use* manual.

Print the job description key information

Menu option 41 will interrogate all user job descriptions defined on your system and produce additional audit reports about them.

The files built (in the OBJAUDLIB library) are:

@DSPJOB - unformatted data relating to key job description information

The audit reports generated are as follows:

<i>Report name</i>	<i>Query name</i>	<i>Description</i>
JOBDLIB	@DSPJOB	Listing of key job description information

This menu option will only work correctly when using the English language version of the Operating System. You must have English defined either as the primary language, or as a secondary language on your server.

The key information, printed for each job description, is

- Job description name
- Job queue name
- Message logging (Level, severity, text, CL program logging)
- Routing data
- Request data
- Initial library list
- Text (description)

The audit reports are processed using standard Query definitions included in the OBJAUDLIB library. These definitions can be manipulated using the IBM WRKQRY (Work with Query Definitions) command. For more details on using the IBM Query product refer to the *iSeries Query Use* manual.

Change job description logging levels

This command allows you to generically change the message logging levels of every job description in a specified user library:

```

Change JOB description logging levels (CHGJOBLOG)

Type choices, press Enter.

Library to process . . . . . LIB

New Message Level . . . . . LEVEL          2
New Message Severity . . . . . SEVERITY    10
New Message Text . . . . . TEXT          *NOLIST

New CL Logging . . . . . LOGCLPGM        *YES

```

Command parameters:

LIB - This parameter defines which library (where the objects currently reside) is to be selected.

New message logging levels

Specifies the message logging values used to determine the amount and type of information sent to the job log by a job using this job description. The parameter has three elements: the message (or logging) level, the message severity, and the level of message text.

LEVEL - Specify a value ranging from 0 through 4, for the message logging level used for the job's messages.

SEVERITY - Specify a value ranging from 00 through 99, for the minimum severity level that causes an error message to be logged in the job's log. Only messages that have a severity greater than or equal to this value are logged in the job's log.

TEXT - Specifies the level of message text that is written in the job log.

LOGCLPGM - Specifies whether the commands that can be logged and were run in a control language program are logged to the job log by way of the CL program's message queue. This parameter sets the status of the job's logging flag.

For a full description of the message logging level parameters, refer to the IBM CL Reference manual.

The OBJAUDLIB audit database files

The files used for object auditing are, in general, standard IBM 'outfiles' that were created by standard IBM commands. However, to allow reporting to work correctly, the data is manipulated after being created.

The following describes the Object Auditing database files. For information on the file layouts, refer to the description of the appropriate IBM command.

@DSPOBJD - User objects list

This 'outfile' is generated from the DSPOBJD (Display object description) command. In general, only user objects that have not been used in over 12 months will be loaded. Exceptions to this rule are:

- Objects where the owner is *IBM are never loaded
- User Database files and save files are always loaded
- User message queues and journal objects are always loaded
- User DFU's and Queries are always loaded
- The OBJAUDLIB library is never loaded

Data changes (performed by program AUD101R) are as follows:

<i>Field name</i>	<i>Definition</i>	<i>Modification made</i>
All Dates	6A	All month/day/year dates have been converted to year/month/day dates
ODCRTS	8A	If blank, this is set to 'Pre V1R3'
ODUDAT	6A	If blank, this is set to either 'last change' date or 'date created'
ODOBLV	8A	This field is used to store a full 8 digit 'last used' date

@DSPMBRLST - User database files list

This 'outfile' is generated from the DSPFD (Display file description) command. The file will contain one record for each member with each user database physical file defined on the system.

There are no data changes made to the data provided by the command.

@DSPSRCF - User source files list

This 'outfile' is generated from the DSPFD (Display file description) command. The file will contain one record for each user source physical file defined on the system.

Please note that the file data will only be correct if NUTIL is installed on your machine. If not, the file will contain both source and data files.

There are no data changes made to the data provided by the command.

@DSPUSRPRF - User profiles list

This 'outfile' is generated from the DSPUSRPRF (Display user profiles) command. The file will contain one record for each user profile defined on the system.

There are no data changes made to the data provided by the command.

@DOCLIST - DLO documents list

This 'outfile' is generated from the QRYDOCLIB (Query document library) command. Only DLO document objects that have not been used in over 3 months will be loaded.

Note that any DLO objects residing in Q* (system) folders are not loaded in to the file.

Data changes (performed by program AUD202R) are as follows:

<i>Field name</i>	<i>Definition</i>	<i>Modification made</i>
QDLSYC	13A	The document type description is loaded
QDLCDD	6A	The 'date last changed' is loaded

Changing the supplied programs

All relevant program source code is supplied within the OBJAUDLIB program library, allowing you to customize the product to your own installation requirements.

If you do not have the NUTIL program product on your system, please be careful when compiling any changes you make to the supplied source. You must ensure that the correct parameters are supplied to the relevant 'create object' command; you can find these parameters at the top of the program source, under the heading 'compiler directives'.

Source supplied is as follows:

QPNSLRC - Panel group source

<i>Member</i>	<i>Type</i>	<i>Text</i>
AUDMNU	MENU	Object Audit Facility menu

QCMDSRC - Command source

<i>Member</i>	<i>Type</i>	<i>Text</i>
AUDCLNOBJ	CMD	Cleanse (remove) old objects
CHGJOBLOG	CMD	Change JOBLOG logging levels
MOVUSROBJ	CMD	Move user objects

QCLSRC - CL Source

<i>Member</i>	<i>Type</i>	<i>Text</i>
AUDCLNOBJ	CLP	Cleanse (remove) old objects
AUD001	CLP	Generate the object auditing database
AUD001A	CLP	Generate audit database file (DSPFD)
AUD003	CLP	Run the audit query reports
AUD091	CLP	Load DSPJOBLOG data in to a database workfile
AUD101	CLP	Compress unused objects
AUD102	CLP	Reorganize database files
AUD103	CLP	Reclaim unused storage
AUD201	CLP	List user profiles
AUD202	CLP	DLO Document exceptions report
CHGJOBLOG	CLP	Change *JOBLOG logging levels
MOVUSROBJ	CLP	Move user objects

QRPGSRC - RPG Source

<i>Member</i>	<i>Type</i>	<i>Text</i>
AUD001R	RPG	Convert @DSPOBJD dates and remove data not required
AUD091R	RPG	Remove data not related to library lists (ENGLISH)
AUD202R	RPG	Convert @DOCLIST dates and remove data not required

Support Contacts

This program product is supplied as Freeware and, as such, no warranty is implied or expressed. The following contacts (preferably done via email) are provided to assist you in resolving initial installation difficulties.

We are interested in receiving your feedback and comments on the product, which can be sent to either of the addresses mentioned below.

Ideas, additions and enhancements to the product are always welcomed. If you have developed functions that you think may benefit other installations we would be happy to host them for distribution at our website - provided the function (both source code and object code) is released as freeware by the author. But fear not, credit will be given where credit is due!

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The latest version of this product, can always be downloaded from the Navan Internet Website, which can be found at

www.navan.co.uk
