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WRKSYSAC2

Precosis PTY Ltd.

Work with System Activity
Version 2.1.0

An Alternative to WRKSYSACT

V.081002

1. Introduction

WRKSYSACT II provides an alternative to the Work with System Activity (WRKSYSACT) command that is only available with Performance Tools.

Basically it does the same job as WRKSYSACT, showing all the jobs and tasks that were active in a time period, and sorted by reverse CPU%. The list may be refreshed either manually or automatically.

It also has benefits over the standard command:

- Has both F5=Refresh and F10=Restart - like WRKACTJOB, so as to get a better average.
- Can be run simultaneously from multiple sessions (WRKSYSACT can be used on one only).
- Shows more useful job info, like Type, Status, Function and Total CPU time.
- Allows jobs to be Held, Ended and Changed.
- Allows information to be filtered by CPU percentages and job and user names.
- Allows output to display, print and database file.

2. How to Install

1. On the AS/400, sign-on as QSECOFR or a user profile having *ALLOBJ authority. Then create a save file, e.g. CRTSAVF QGPL/SAVF

2. On your PC start a DOS session, then transfer WSA.SAV to the AS/400 using the following FTP commands:

cd c:\temp	(or the directory where wsa.sav resides)
ftp sysname	(where **sysname** = your AS400 System Name – see footnote)
	(enter user id, then password, as prompted by ftp)
bin	(selects binary image transfer)
put wsa.sav qgpl/savf replace	(copies file to AS400 save file)
quit	(exit ftp)
exit	(exit DOS session)

3. On the AS/400, check that the save file contains information:

      DSPSAVF SAVF

4. Restore the objects into any chosen library:

      RSTOBJ *ALL QTEMP *SAVF SAVF(SAVF) RSTLIB(*yourlib*)

  where *yourlib* is your utility / programming tools library, eg. QGPL.

Note for v5r1 users:
  If you are using V5R1 (or higher) of OS/400, then before restoring the objects you will need to change the system value QVFYOBJRST to '1'. This new system value can prevent programs from being restored unless they have a 'digital certificate'. This product has no certificate because it is compiled to an early target release that doesn't allow them. After restoring, you may change QVFYOBJRST back to its default value of '3', or leave as is.

- - -   End of procedure.   - - -

(Continue with section 'How to use'.)

Footnote: If you don't know your 'system name' you can instead use the direct TCP/IP internet address of your AS/400. Do a CFGTCP then take option 1, then select an address which has a line type *ELAN. So the above ftp command would have the form of e.g. **ftp 192.168.10.30**

3. How to use

To use this product, run the command: **WRKSYSAC2**

This will bring up the main display as shown below. Use F5 or F10 to refresh/restart the CPU % calculations, or F19 to do it automatically.

```
                        Work with System Activity II                PRECOSIS
                                                            24/06/01  11:16:32
 Automatic refresh in seconds . . . . . . . :     5     OFF
 Elapsed time . . . . :   00:00:12        Overall CPU util % . :   28.7
 Active/Total CPUs  . :   1 / 1           Interact util/limit %:  19.6   18.2

 Type options, press Enter.
   2=Change   3=Hold   4=End   5=Work with   6=Release

     Job or                                  CPU   CPU
 Opt  Task          User        Number  Typ  Pty  %     total   Sts   Function
  _   DSP01         QUSER       011581  INT  10   17.2  1995.5  RUN   CMD-RUNQRY
  _   CFINT01                                0    8.1  4426.6
  _   DSP02         QSECOFR     011582  INT  20    2.4   126.1  DSPW  *  -CMDENT
  _   QPADEV0003    QPGMR       011593  INT  20     .9    66.8  RUN   CMD-WRKSYSAC2
  _   RMTMSAFETASK                             0     .1   370.2
  _   QPFRADJ       QSYS        010835  SYS   0     .0   253.4  EVTW
  _   VTMTS0013                                0     .0   211.8
  _   QINTER        QSYS        010929  SBS   0     .0    29.9  DEQW
  _   SK-ASC001                                0     .0    7.95

                                                                        Bottom
 F3=Exit   F5=Refresh   F10=Restart   F12=Cancel   F19=Auto Refresh   F21=Cmd
```

This main screen shows a list of active jobs and tasks that had some CPU activity since the last display. From this list, jobs may be selected for certain actions. An explanation of fields follows:

Automatic refresh in seconds

When automatic refresh is active, this is the time in seconds that the product will wait until a refresh is done. The refresh will effectively be done via the F10 option.

To start and end automatic mode, press F19. The status of automatic mode is shown to the right as either OFF or ON.

Elapsed time

The time in hours, minutes and seconds that the CPU data relates to. This will be the time since the command was called, F10 was pressed or automatic refresh did an update.   The initial delay is one second. Longer elapsed times with give better averages.

Overall CPU utilization %

The amount of CPU time used by the system in total, as a percentage of elapsed time. This should be a sum of all the percentages shown in the list. Note that due to rounding and time measurement errors, this may sometimes be greater than 100%.

Interactive utilization / limit %

There are two values given here:

The value on the left is the amount of CPU time used by all interactive jobs on the system, as a percentage of elapsed time.

The value on the right is the maximum limit of interactive usage allowed by the system, which is fixed for the system model and its feature codes.

These values indicate when interactive usage is exceeding, or is close to reaching its limit, which may cause performance degradation. On earlier releases of OS/400 (v4r3 and below(?)), the interactive limit (second value) is not easily retrievable, so it always displays as zero.

Active/Total CPUs

There are two values given here:
   The value on the left is the number of processors available on the machine and the value on the right is total number of processors installed. The first value is used when calculating CPU % usage, by dividing CPU usage by this value. These two values are usually the same, however when the 'Capacity on Demand' feature is operating, the first value may be less than the second.

Option

   The option field allows for actions on jobs. Note that this may only be used against jobs and is not valid for tasks.

Valid actions are:
   2   Change job. A CHGJOB prompt will display.
   3   Hold job.
   4   End job. An ENDJOB prompt will display with the *IMMED option selected.
   5   Work with job.
   6   Release job.

Job or task

   The name of the job or task.

Job type

   The job type. See the help text in the WRKACTJOB command for a full list of these.

Priority

   The run-time priority of the job.

CPU percentage

   The amount of CPU time used by the job or task, as a percentage of elapsed time. The list will automatically sort by the descending value of this column.

CPU total

   The amount of CPU time in seconds used by the job or task since it started. This column has a floating decimal point and may display more decimal places for smaller values. For large values this column will show an exponential result in the form N.NNNeX which is $N.NNN * 10^X$. E.g. 1.234e7 = 12340000 seconds.

Job status

   The job status. See the help text in the WRKACTJOB command for a full list of these.

Job function

   The job function. See the help text in the WRKACTJOB command for an explanation of this.

Special feature: When the function is a program, as in 'PGM-xxxxx', this product will try to instead show another program: the highest program in the call stack (higher = more recently called) that is in a user library. Doing this will make the function description more meaningful since the program displayed by WRKSYSACT is normally the menu driver rather than the actual application program being used.

Function keys:

Enter Select jobs for action. See above for list of valid actions.
F1   Display help.
F3   Exit product.
F5   Refresh the list - the time interval in which data is collected is extended to include new job/task activity.
             This is similar to the way F5 works in WRKACTJOB.
F10   Restart the list - data will be collected from when the list was last displayed - old data is discarded. This
             is similar to the way F10 works in WRKACTJOB and in the standard WRKSYSACT command.
F12   Exit product.
F19   Start/End automatic refresh mode.
F21   Display a command entry window.
Print   Do a standard screen print.

3.1 Auto refresh window

This window is displayed when automatic refresh mode is activated. From here a different refresh interval may be entered.

This is the time in seconds that the product will wait until a refresh is done. The refresh will effectively be done via the F10 option

```
┌─────────────────────────────────────────────┐
│                                             │
│          Automatic Refresh Mode             │
│                                             │
│   Enter refresh interval in seconds:    5   │
│                                             │
│            F3=Exit    F12=Cancel            │
│                                             │
└─────────────────────────────────────────────┘
```

Function keys:

Enter Start automatic refresh mode.
F1 Display help.
F3 Exit product.
F12 Return to previous screen.

4. Using filtering and print/database output options

The WRKSYSAC2 command has parameters that allow output to be alternatively directed to a spool (print) file or database file. It also has parameters that allow jobs and tasks to be selected based on various filtering information, such as name, user and CPU% consumption. These parameters are described below:

```
OUTPUT        Output                    CPUSJOBPC    CPU% filter for selected jobs
INFTYPE       Type of information       ITVLEN       Interval length (seconds)
CPUJOBPCT     CPU job percent filter    NBRITV       Number of intervals
CPUTOTPCT     CPU total percent filter  PRTBLANK     Print blank between results
CPUINTPCT     CPU total interactive     OUTFILE      File to receive output
              percent filter
JOBNAMES      Job/Task names            OUTMBR       Output member options
JOBUSERS      Job users
```

Output (OUTPUT)

Specifies whether the output from the command is displayed at the requesting work station or printed with the job's spooled output.

*	The output is displayed.
*PRINT	The output is printed with the job's spooled output.
*OUTFILE	The output is directed to the database output file specified on the OUTFILE parameter.

Type of information (INFTYPE)

Specifies the type of information that is displayed or written to the printer or database file.

*ALL	Both jobs and tasks are displayed or written to the printer or database file.
*JOBS	Only jobs are displayed or written to the printer or database file.
*TASKS	Only tasks are displayed or written to the printer or database file.

CPU job percent filter (CPUJOBPCT)

Limits the amount of information that is displayed or written to the printer or database file. Only jobs or tasks that consume more than this amount will be listed. This will not apply to jobs/tasks that are selected by the JOBNAMES / JOBUSERS parameters if the CPUSJOBPC parameter is also specified.

CPU total percent filter (CPUTOTPCT)

Limits the amount of information that is displayed or written to the printer or database file. Only when the total CPU of all jobs/tasks consumes more than this amount will any information be listed.

CPU total interactive percent filter (CPUINTPCT)

Limits the amount of information that is displayed or written to the printer or database file. Only when the total CPU of all interactive jobs – jobs of type 'INT' – consumes more than this amount, will any information be listed.

Job/Task names (JOBNAMES)

Limits the amount of information that is displayed or written to the printer or database file. A list of job or tasks names may be given. Only jobs or tasks which match these names will be listed. Generic names may be specified.

Job users (JOBUSERS)

Limits the amount of information that is displayed or written to the printer or database file. A list of user names may be given. Only jobs which match these user names will be listed. Generic names may be specified.

CPU% filter for selected jobs (CPUSJOBPC)

Limits the amount of information that is displayed or written to the printer or database file. This parameter relates only to jobs/tasks selected by the JOBNAMES and JOBUSERS parameters. It has the following effect:

(a) If JOBNAMES and/or JOBUSERS are specified and CPUSJOBPC is specified then jobs/tasks that pass the JOBNAMES / JOBUSERS and CPUSJOBPC parameters are listed. In addition to this all other jobs on the system are listed when this test passes. Those other jobs may be filtered by the CPUJOBPCT parameter. This allows the CPU% consumption to be compared between selected and other jobs.

(b) If JOBNAMES and/or JOBUSERS are specified but CPUSJOBPC is NOT specified then only jobs/tasks that pass the JOBNAMES / JOBUSERS and the CPUJOBPCT and other filtering parameters are listed.

(c) If JOBNAMES and/or JOBUSERS are NOT specified and CPUSJOBPC is specified then the CPUSJOBPC parameter is ignored.

The second part of this parameter is the comparison type. This tells whether CPU% for selected jobs should be compared as being less-than (LT) or greater-than (GT) the CPUSJOBPC percentage value.

Interval length (ITVLEN)

Specifies the number of seconds between the times when the display is refreshed in automatic refresh mode or written to the database or print file.

*NOMAX   When in display mode, this will default to having no automatic refresh.
      When outputting to a printer or output file, this special value is ignored and a
      refresh interval of 5 seconds is substituted.
interval-length Specify the number of seconds (1-999) between refreshes.

Number of intervals (NBRITV)

Specifies the number of times the data is collected and written to the display, printer or output file.

*NOMAX   An unlimited number of intervals. When outputting to a printer or output file, it
       will be necessary to stop the process either by SysReq/2 or job cancellation.
number-of-intervals Specify the number of times to collect the performance data and write to the
       display, printer or database file.

Print blank between results (PRTBLANK)

Specifies whether a blank line should be printed between groups of records.

*YES   Print a blank line between lists of jobs on the print-out. This makes the report easier to
     read.
*NO   Do not print a blank line between lists of jobs on the print-out. When monitoring only
     one job via the JOBNAMES / JOBUSERS parameters, this may be a useful space-
     saver since the blank line would not be necessary.

File to receive output (OUTFILE)

Specifies the name and library of the database output file to which the output of the command is directed. If the file does not exist, this command creates a database output file in the specified library.
If the file already exists it must have the same format as the file WRKSYSACO which is part of this product.

Output member options (OUTMBR)

Specifies the name of the database file member that receives the output of the command.

*FIRST   The first member in the file receives the output. If no members exist in the file, the system creates a member with the name of the file specified in the OUTFILE parameter.
member-name   Specify the name of the file member that receives the output. If the member does not exist, the system creates it.

The possible values for how information is stored are:

*REPLACE   The output data replaces any existing records in the specified file member.
*ADD   The output data is added to the end of existing records in the specified file member.

4.1 Examples on using the filtering options

Below are some examples which show how to use the filtering parameters:

1. Produce a print-out of when the total CPU for the system exceeds 80%. Average at one minute intervals for 24 hours.

```
WRKSYSAC2 OUTPUT(*PRINT) CPUTOTPCT(80) ITVLEN(60)
          NBRITV(1440)
```

This can be submitted to batch so that a terminal will not be tied up.

2. Send to a database file, all tasks/jobs which take more than 50%. Average at 30 second intervals. Let this job run until it is cancelled.

```
WRKSYSAC2 OUTPUT(*OUTFILE) CPUJOBPCT(50) ITVLEN(30)
          OUTFILE(QGPL/CPUOUTPUT)
```

Because NBRITV is defaulted to *NOMAX, this will need to be cancelled by ending the job, or by SysReq/2 if run interactively. But the database file may queried at any time.

3. A job is submitted as an overnight process. We want to know when this job falls below 50% CPU. When it does we also want a list of other competing jobs that are using more than 1%. This may show why a job has taken longer than expected. The job name is DAYEND and the user is QSYSOPR. We will monitor it at 30 second intervals for 8 hours and send the results to a print file.

```
WRKSYSAC2 OUTPUT(*PRINT) CPUJOBPCT(1.00)
          JOBNAMES(DAYEND) JOBUSERS(QSYSOPR)
          CPUSJOBPC(50 LT) ITVLEN(30) NBRITV(960)
```

4. We want to know when interactive utilization causes the governor to be triggered. To do this we will monitor for when any of the 'interactive governor tasks' CFINTnn rise above 10%. When they do we also want a list of other jobs that are using more than 1%. From this we can see what jobs are responsible for triggering the governor. We will monitor at 10 second intervals for 24 hours and send the results to a print file.

```
WRKSYSAC2 OUTPUT(*PRINT) CPUJOBPCT(1.00)
          JOBNAMES(CFINT*) CPUSJOBPC(10 GT)
          ITVLEN(10) NBRITV(8640)
```

5. Conditions of use

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