RSM PARTNERS

z/VM Admin Tool Ideas

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z/VM Admin Tool Ideas

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Introduction

So you have z/VM.

What else can you do with it?

How can you make z/VM more self maintaining.

The aim of this presentation is to show that some useful tools are available and can assist with maintaining the system so you don’t have to.

Agenda

- Introduction
- Tools and Utilities freely available
  - WAKEUP MODULE
  - VMARC MODULE
  - SFPURGER Module
  - GETSITE EXEC
- Practical application ideas for these tools
  - ARCMSTR (CMS file level backup of key files)
  - LOGMSTR (archiving of various log files)
  - CRON (Simple Unix/Linux style scheduler)

Tools and Utilities Freely Available

WAKEUP Module

- Documented in CMS Commands and Utilities Manual
- Available on the MAINT 193 minidisk
- For Linux/Unix People similar to CRON
  - wakeup to schedule tasks/commands
  - wakeup on receipt of a file and act on it
  - wakeup to an IUCV/SMSG message received

This tool is extremely versatile, I have used it many times over the years to solve problems, automate tasks and be the core of a CMS server application.

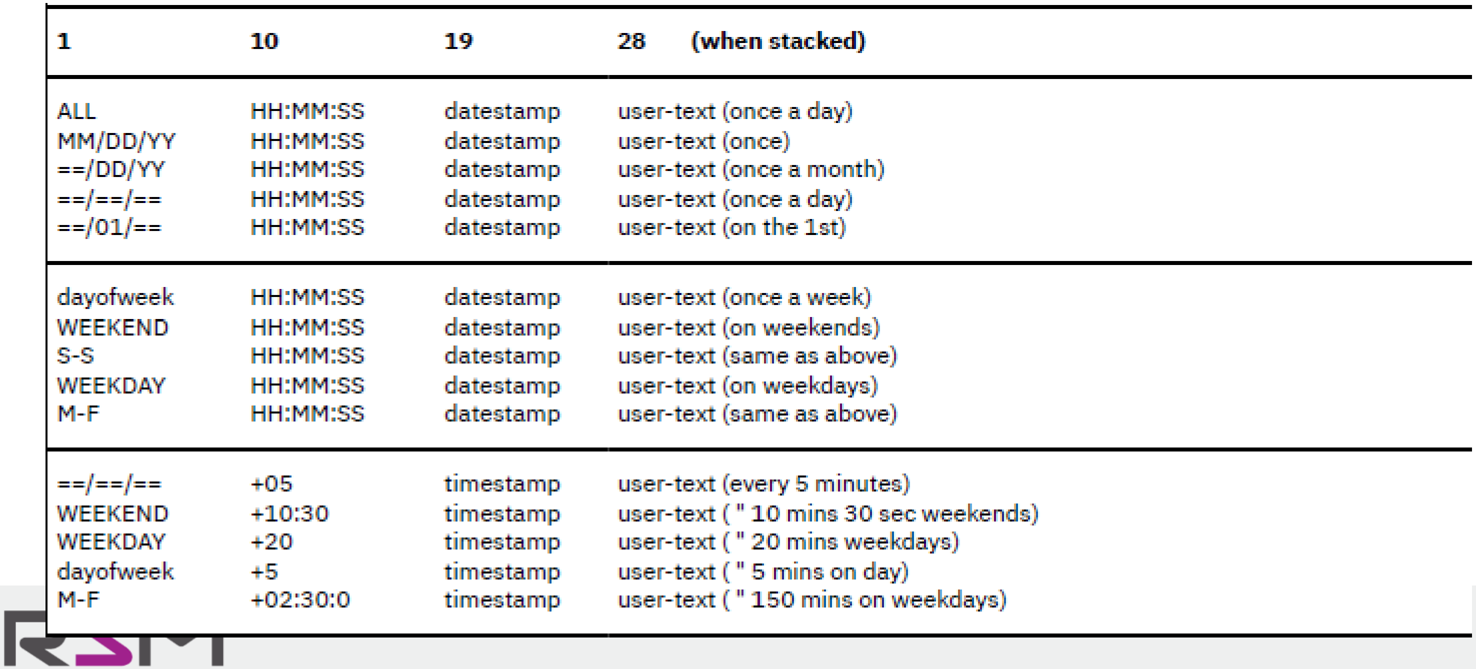
It is return code based, so each interrupt file, message, schedule is a different rc.

Tools and Utilities Freely Available

WAKEUP Module

Wakeup times are set in a cron type file

Each line can specify time/date/day/month etc and command to run.



1	10	19	28 (when stacked)
ALL	HH:MM:SS	datestamp	user-text (once a day)
MM/DD/YY	HH:MM:SS	datestamp	user-text (once)
==/DD/YY	HH:MM:SS	datestamp	user-text (once a month)
==/==/==	HH:MM:SS	datestamp	user-text (once a day)
==/01/==	HH:MM:SS	datestamp	user-text (on the 1st)
dayofweek	HH:MM:SS	datestamp	user-text (once a week)
WEEKEND	HH:MM:SS	datestamp	user-text (on weekends)
S-S	HH:MM:SS	datestamp	user-text (same as above)
WEEKDAY	HH:MM:SS	datestamp	user-text (on weekdays)
M-F	HH:MM:SS	datestamp	user-text (same as above)
==/==/==	+05	timestamp	user-text (every 5 minutes)
WEEKEND	+10:30	timestamp	user-text (" 10 mins 30 sec weekends)
WEEKDAY	+20	timestamp	user-text (" 20 mins weekdays)
dayofweek	+5	timestamp	user-text (" 5 mins on day)
M-F	+02:30:0	timestamp	user-text (" 150 mins on weekdays)

Tools and Utilities Freely Available

VMARC Module

Available from the VM downloads site:

http://www.vm.ibm.com/download/

For Linux/Unix people, think of VMARC as a tar archive for CMS

The VM download packages are downloaded in tersed vmarc format.

http://www.vm.ibm.com/download/packages/

But, beware there is no support for these packages. Some may also be VM release dependant, especially some of the older ones.

Tools and Utilities Freely Available

VMARC Module

VMARC in its simplest form

PACK	fn VMARC ft ifn ift ifm	– Create an archive
UNPK	fn VMARC ft	– Extract and archive
LIST	fn VMARC ft	-- List Contents

Tools and Utilities Freely Available

SFPURGER Module

Used to automate the clearing down of the RDR/PRT/PUN/DMP files

Can be run from Operations manager schedule, zVPS schedule, using Wakeup or just a simple CMS user which executes sfpurger tool. There are two input files:

- OPTIONS File
  - The defaults are usually ok, so not always necessary to have one, if not found will use system defaults anyway.
- CONTROL File
  - Should be tailored to site requirements. Sets what happens to the spool files.

Tools and Utilities Freely Available

SFPURGER Module

Different un Modes

TEST tests SFPURGER, *without actually performing spool file maintenance*.

RUN Executes SFPURGER for normal operation.

FORCE Executes SFPURGER, which reads the SFPURGER CONTROL file and does spool file maintenance, *regardless* of the time it is invoked or whether it has run successfully earlier the same day.

There are others, check the manual, but these are the main modes.

Tools and Utilities Freely Available

SFPURGER CONTROL example

```
* Purge listing output with 1000 or more records
RECORDS 1000 FTYPE LISTING ACTION PURGE
* Keep spool files owned by maintenance user IDs
USERID MAINT* ACTION IGNORE
* Ignore dump files that have an origin of SYSTEM. Purge any other
* dump files after 4 weeks. Ignore the rest
TYPE DMP ORIGINID SYSTEM ACTION IGNORE
TYPE DMP DAYS 29 ACTION PURGE
TYPE DMP ACTION IGNORE
* Purge files awaiting transmission after 2 weeks. Ignore the rest
QUEUE RDR USERID RSCS DAYS 15 ACTION PURGE
QUEUE RDR USERID RSCS ACTION IGNORE
```

Tools and Utilities Freely Available

SFPURGER CONTROL example cont’d

```
* Purge files received through RSCS after 4 weeks. Ignore the rest
QUEUE RDR ORIGINID RSCS DAYS 29 ACTION PURGE
QUEUE RDR ORIGINID RSCS ACTION IGNORE
* Change console logs to system hold after 1 week
TYPE CON DAYS 8 ACTION SYSHOLD
* Purge any reader files in USERHOLD after 4 weeks. Ignore the rest
QUEUE RDR DAYS 28 HOLD USER ACTION PURGE
QUEUE RDR ACTION IGNORE
* Purge any other print files after 2 weeks. Change the rest to USERHOLD
QUEUE PRT DAYS 15 ACTION PURGE
QUEUE PRT ACTION USERHOLD
```

Tools and Utilities Freely Available

GETSITE exec

Published on a xephon z/VM Update some years ago

Used to call a parsed value in a file and return contents.

Parsed value can be a list of items or single value.

Can be used to setup default values for the system from which all EXEC's query. **Only one place to make variable changes.**

Tools and Utilities Freely Available

GETSITE exec example input file zARCH INFO

```
*-------------------------------------------------------------------
* CURRENT VERSION
*-------------------------------------------------------------------
ZARCH.VER      1.0.0
*-------------------------------------------------------------------
* VM/OPERATOR CONSOLE
*-------------------------------------------------------------------
ZARCH.OPTR     OPERATOR
*-------------------------------------------------------------------
* SERVER NAME
*-------------------------------------------------------------------
ZARCH.SERVER   ARCMSTR
```

```
optr =  getsite(ZARCH, ‘ZARCH.OPTR’)
```

Returns OPERATOR in variable optr

ARCMSTR

Note: There is no undelete on z/VM, if you delete a file it's gone.

I wrote the ARCMSTR server to save my blushes for just such an occasion. A client used this and it has saved them too. It does happen!!

Yes, there are IBM and/or ISV tools available to perform this more extensively, but many sites still do not have these chargeable software products installed.

It is very simple to setup and is self maintaining, ie old archives dropped when archive minidisk is 80% full.

ARCMSTR

ARCMSTR is a CMS server making use of the VMARC tool to create archives of key files around z/VM. Such as:

System Config

TCPIP settings

RSCS Config

USER DIRECT

Sysprog 191 mdisks

Maint CF1 mdisk with CP Module

ARCMSTR

ARCMSTR input file:

```
*user id    disk  filename    filetype    archive     append
PMAINT      CF0   *           CONFIG*     CF0ARCH     N
 MAINT      CF1    *          LOGO        CF1ARCH     N
 MAINT710   CF2   CPLOAD      MODULE      CF2ARCH     N
 MAINT      CF3   *           LOGO        CF3ARCH     N
 MAINT710   1198  *           *           OPMARCH     N
 RSCS       401   *           CONFIG      RSCARCH     N
 TCPMAINT   198   *           CONFIG      TCPARCH     N
 TCPMAINT   198    *          TCPIP       TCPARCH     Y
 TCPMAINT   198   SYSTEM      DTCPARMS    TCPARCH     Y
 RSMXX      191   *           *           AXXARCH     N
LOGMSTR     191   *           *           LOGARCH  N
 ARCMSTR    191   *           *           ARCARCH  N
```

ARCMSTR

ARCMSTR Profile exec

Runs an exec to check the archive minidisk is not full

If the archive mdisk is over threshold of 80% it runs clean exec to remove oldest archives (120 days old), so self maintaining.

It then runs the ZARCH exec which reads the input file, links to the users minidisks and creates the archive with a ft of todays date.

Each run on same day will replace same days archive.

An exec ARCHLOGS can be used to list the archives. An archive can be extracted to current user by running ‘vmarc unpk’ against an archive on the list to extract them to the current user. Or ‘vmarc list’ to list the contents.

Archives can be appended to have multiple file selctions for same mdisk, excluding unwanted files.

LOGMSTR

A Server to archive LOG files for a set number of days for future diagnosis.

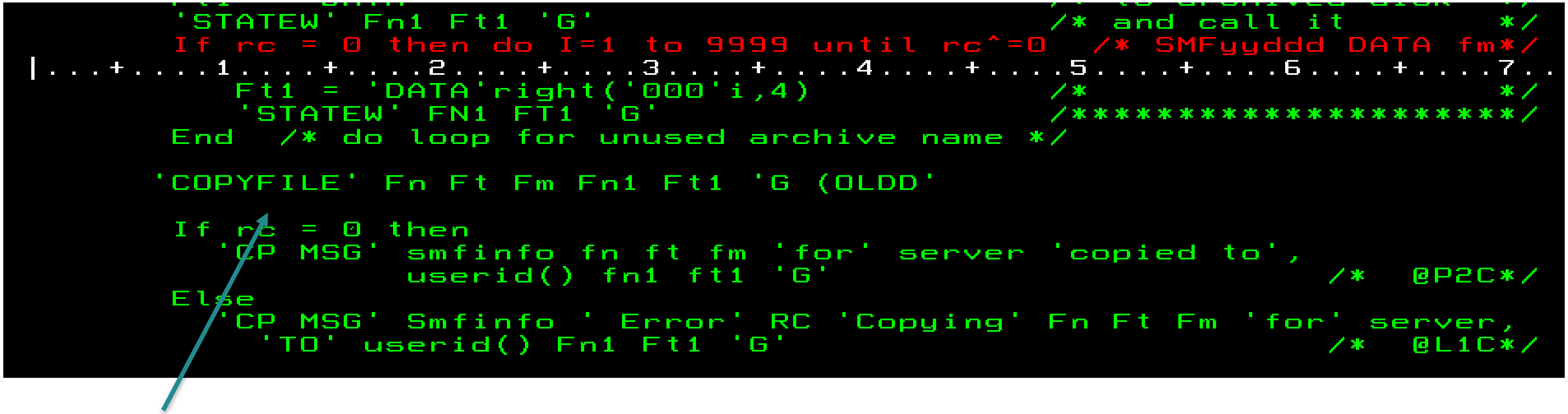
These LOGS can be Operations Manager console logs, SMF Logs if RACF is installed (needs a modified SMFPROF exec), EREP Logs. Or any others.

These LOG files can also be forwarded on elsewhere. For example SMF logs to z/OS via RSCS link to JES. SMF logs are the same format (almost) as z/OS so can be analysed by z/OS based tools. There is a tool to

The server wakes up weekly to check each type of LOG file and remove those over a set number of days, so it is all self maintaining.

LOGMSTR

SMFPROF EXEC



```
        'STATEW' Fn1 Ft1 'G'                     /* and call it       */
        If rc = 0 then do I=1 to 9999 until rc^=0  /* SMFyyddd DATA fm*/
|...+....1....+....2....+....3....+....4....+....5....+....6....+....7..
           Ft1 = 'DATA'right('000'i,4)           /*                   */
           'STATEW' FN1 FT1 'G'                  /*********************/
        End  /* do loop for unused archive name */

       'COPYFILE' Fn Ft Fm Fn1 Ft1 'G (OLDD'

        If rc = 0 then
          'CP MSG' smfinfo fn ft fm 'for' server 'copied to',
                   userid() fn1 ft1 'G'                       /*   @P2C*/
        Else
          'CP MSG' Smfinfo ' Error' RC 'Copying' Fn Ft Fm 'for' server,
            'TO' userid() Fn1 Ft1 'G'                         /*   @L1C*/
```

Need to insert a line after copyfile:
‘Sendfile’ fn1 ft1 ‘G to LOGMSTR’
And possibly run smfconv against it prior to sending it to reformat for analysis on MVS.

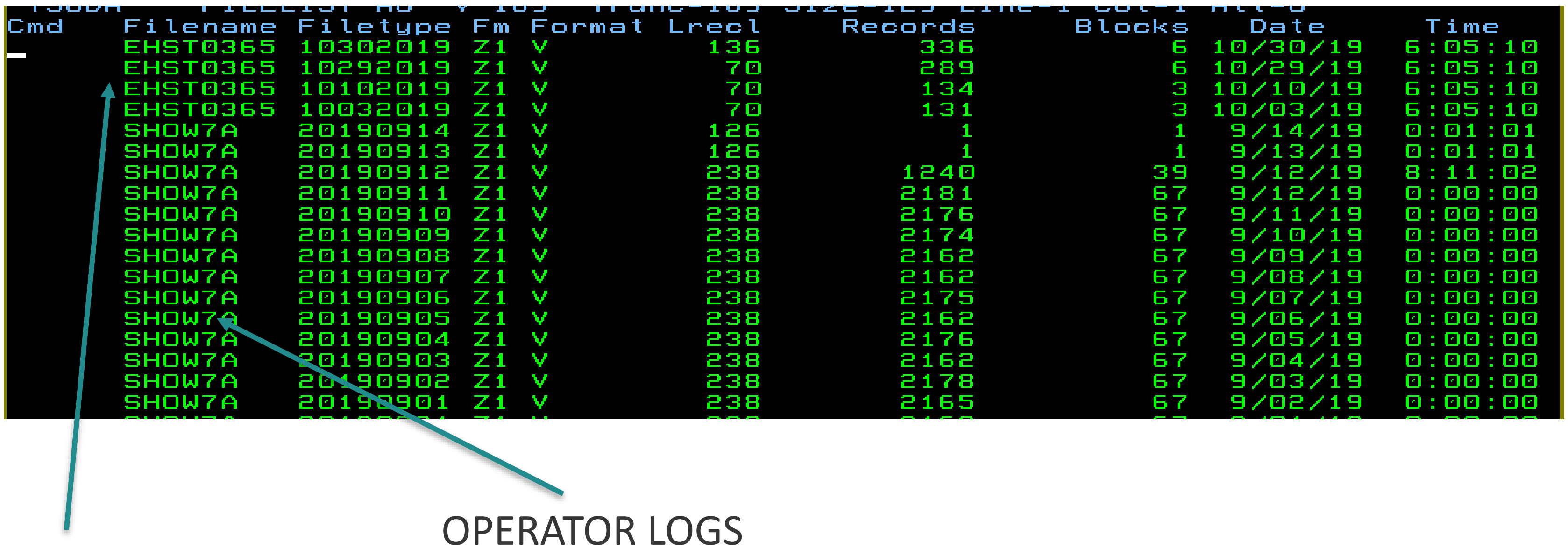
LOGMSTR

Profile EXEC

```
do forever
 'CP SET EMSG OFF'
 'WAKEUP +1 (RDR NOEXT SMSG QUIET FILE (WAKEUP TIMES A)'
 sr=rc
 Say "Retcode:" sr 'AT' date() time()
 select
   when sr=1 then EXEC 'LG$CMND'
   when sr=2 then iterate
   when sr=3 then do
     parse upper pull asterisk reqno field1 field2 field3 field4 Args
     if field4='CMD' then address command Args
                end
   when sr=4 then address command 'EXEC LG$RECV'
   otherwise signal exit
 end
end
exit:
exit rc
```

LOGMSTR

The LOGS exec will display selected archive:



```
Cmd    Filename Filetype Fm Format Lrecl      Records      Blocks   Date      Time
       EHST0365 10302019 Z1 V        136          336           6 10/30/19  6:05:10
_      EHST0365 10292019 Z1 V         70          289           6 10/29/19  6:05:10
       EHST0365 10102019 Z1 V         70          134           3 10/10/19  6:05:10
       EHST0365 10032019 Z1 V         70          131           3 10/03/19  6:05:10
       SHOW7A   20190914 Z1 V        126            1           1  9/14/19  0:01:01
       SHOW7A   20190913 Z1 V        126            1           1  9/13/19  0:01:01
       SHOW7A   20190912 Z1 V        238         1240          39  9/12/19  8:11:02
       SHOW7A   20190911 Z1 V        238         2181          67  9/12/19  0:00:00
       SHOW7A   20190910 Z1 V        238         2176          67  9/11/19  0:00:00
       SHOW7A   20190909 Z1 V        238         2174          67  9/10/19  0:00:00
       SHOW7A   20190908 Z1 V        238         2162          67  9/09/19  0:00:00
       SHOW7A   20190907 Z1 V        238         2162          67  9/08/19  0:00:00
       SHOW7A   20190906 Z1 V        238         2175          67  9/07/19  0:00:00
       SHOW7A   20190905 Z1 V        238         2162          67  9/06/19  0:00:00
       SHOW7A   20190904 Z1 V        238         2176          67  9/05/19  0:00:00
       SHOW7A   20190903 Z1 V        238         2162          67  9/04/19  0:00:00
       SHOW7A   20190902 Z1 V        238         2178          67  9/03/19  0:00:00
       SHOW7A   20190901 Z1 V        238         2165          67  9/02/19  0:00:00
```

OPERATOR LOGS

EREP LOGS

NO SMF LOGS on this system

LOGMSTR

LOGMSTR detects a file arriving (rc=4) and simply reads the file from the reader and stores it onto the archive minidisk.

The file being received should have the correct filename and filetype (with timestamp) to be received in.

The next version will allow me to send a command to LOGMSTR to perform:

- A list of archives or selective list.
- Request a log file to be sent to the requestors RDR.
- Perform a cleanup

CRON

CRON is uses WAKEUP to schedule tasks to run at specific times.

This tasks can be CP commands, EXEC's or modules to be executed.

The Wakeup times file can be very flexible in scheduling tasks, however it is a manual edit to change it.

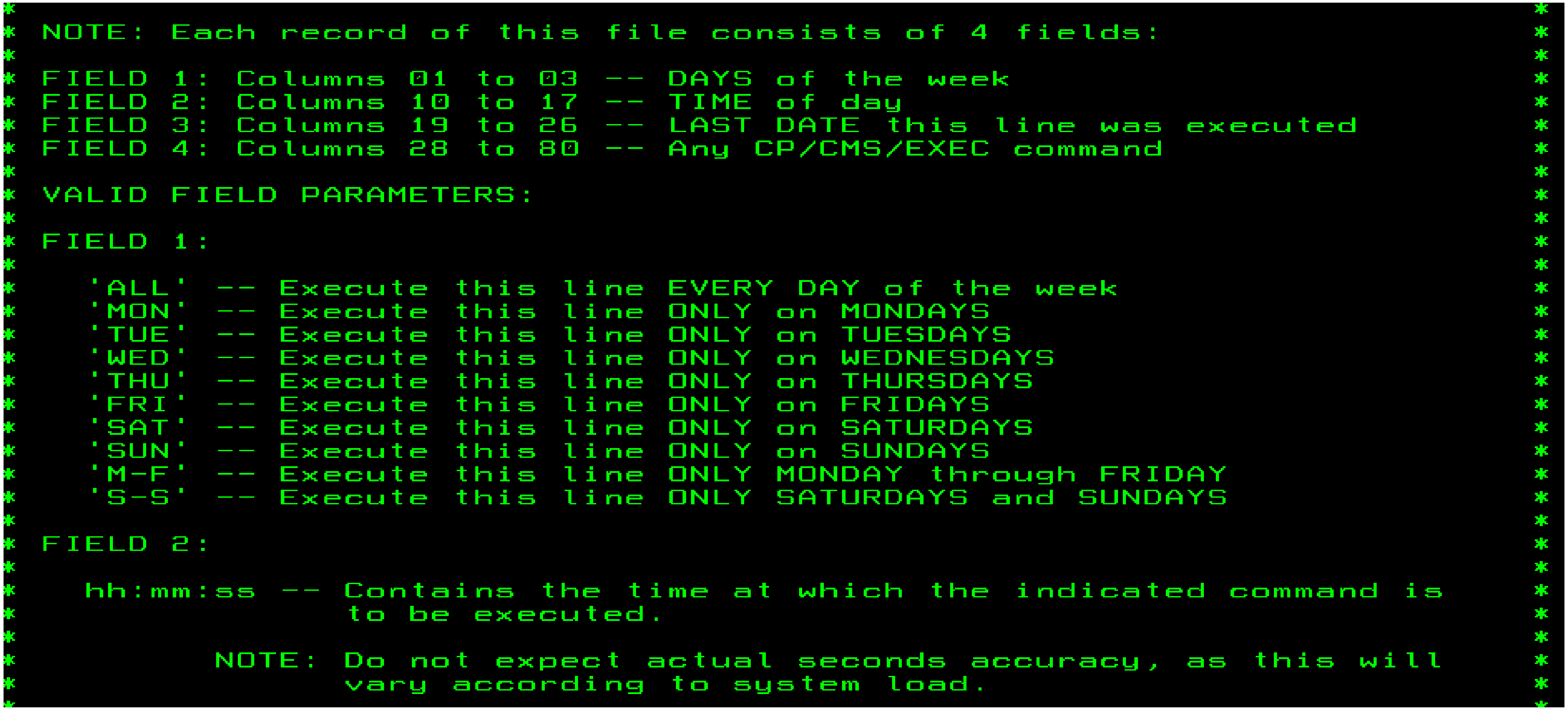
CRON

CRON User DIRECT

```
IDENTITY CRON XXXXXX 256M 512M BDEG
  IPL CMS
  IUCV ALLOW
  MACHINE ESA
  OPTION LNKNOPAS
  CONSOLE 0009 3215 T OPERATOR
  SPOOL 000C 2540 READER *
  SPOOL 000D 2540 PUNCH A
  SPOOL 000E 1403 A
  LINK MAINT 0190 0190 RR
  LINK MAINT 019D 019D RR
  LINK MAINT 019E 019E RR
  LINK MAINT 05E5 05E5 RR
  LINK MAINT 0193 0193 RR
  MDISK 0191 3390 1 20 XXXXXX  MW
```

CRON

Wakeup File Options:



```
*                                                                       *
* NOTE: Each record of this file consists of 4 fields:                  *
*                                                                       *
* FIELD 1: Columns 01 to 03 -- DAYS of the week                         *
* FIELD 2: Columns 10 to 17 -- TIME of day                              *
* FIELD 3: Columns 19 to 26 -- LAST DATE this line was executed         *
* FIELD 4: Columns 28 to 80 -- Any CP/CMS/EXEC command                  *
*                                                                       *
* VALID FIELD PARAMETERS:                                               *
*                                                                       *
* FIELD 1:                                                              *
*                                                                       *
*   'ALL' -- Execute this line EVERY DAY of the week                    *
*   'MON' -- Execute this line ONLY on MONDAYS                          *
*   'TUE' -- Execute this line ONLY on TUESDAYS                         *
*   'WED' -- Execute this line ONLY on WEDNESDAYS                       *
*   'THU' -- Execute this line ONLY on THURSDAYS                        *
*   'FRI' -- Execute this line ONLY on FRIDAYS                          *
*   'SAT' -- Execute this line ONLY on SATURDAYS                        *
*   'SUN' -- Execute this line ONLY on SUNDAYS                          *
*   'M-F' -- Execute this line ONLY MONDAY through FRIDAY               *
*   'S-S' -- Execute this line ONLY SATURDAYS and SUNDAYS               *
*                                                                       *
* FIELD 2:                                                              *
*                                                                       *
*   hh:mm:ss -- Contains the time at which the indicated command is     *
*               to be executed.                                         *
*                                                                       *
*         NOTE: Do not expect actual seconds accuracy, as this will     *
*               vary according to system load.                          *
*                                                                       *
```

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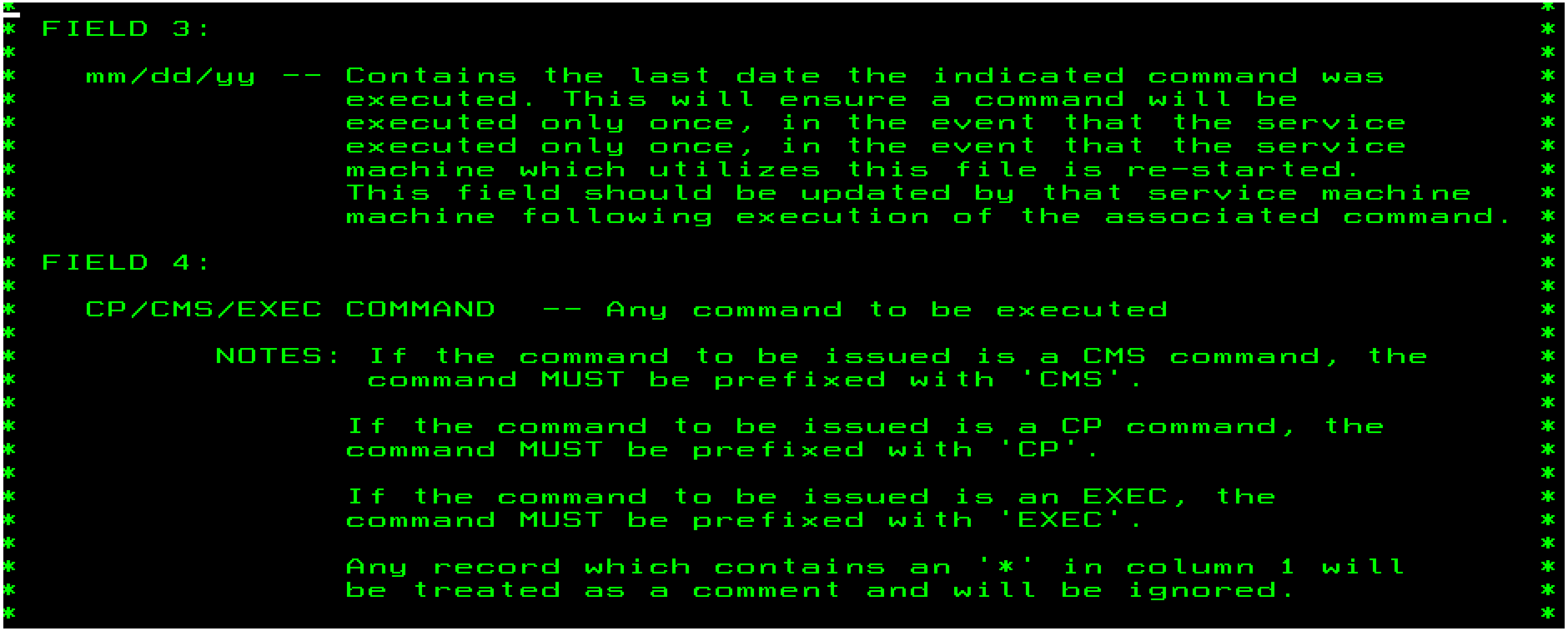
MAINFRAME

CRON

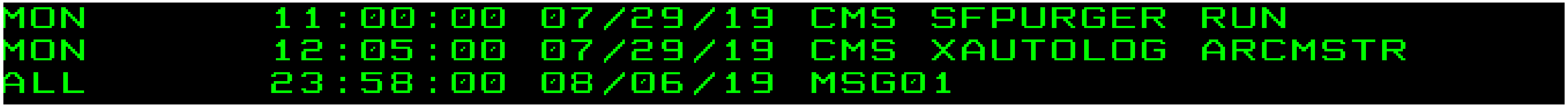
Wakeup File Options:



```
*                                                                      *
* FIELD 3:                                                             *
*                                                                      *
*   mm/dd/yy -- Contains the last date the indicated command was       *
*               executed. This will ensure a command will be           *
*               executed only once, in the event that the service      *
*               executed only once, in the event that the service      *
*               machine which utilizes this file is re-started.        *
*               This field should be updated by that service machine   *
*               machine following execution of the associated command. *
*                                                                      *
* FIELD 4:                                                             *
*                                                                      *
*   CP/CMS/EXEC COMMAND  -- Any command to be executed                 *
*                                                                      *
*         NOTES: If the command to be issued is a CMS command, the     *
*                command MUST be prefixed with 'CMS'.                  *
*                                                                      *
*               If the command to be issued is a CP command, the       *
*               command MUST be prefixed with 'CP'.                    *
*                                                                      *
*               If the command to be issued is an EXEC, the            *
*               command MUST be prefixed with 'EXEC'.                  *
*                                                                      *
*               Any record which contains an '*' in column 1 will      *
*               be treated as a comment and will be ignored.           *
*                                                                      *
```

CRON

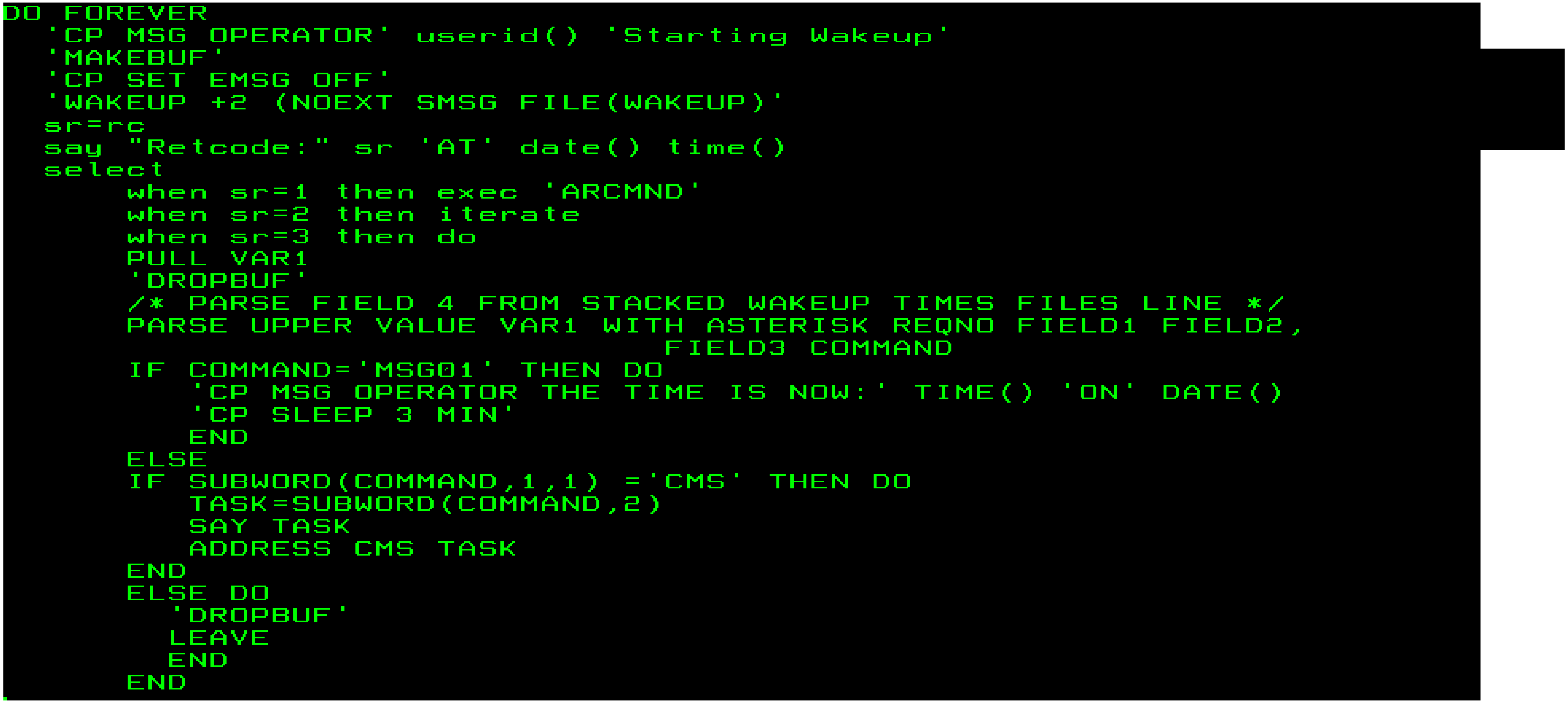
Wakeup File Sample:



```
MON      11:00:00 07/29/19 CMS SFPURGER RUN
MON      12:05:00 07/29/19 CMS XAUTOLOG ARCMSTR
ALL      23:58:00 08/06/19 MSG01
```

CRON

CRON Profile EXEC:



```
DO FOREVER
  'CP MSG OPERATOR' userid() 'Starting Wakeup'
  'MAKEBUF'
  'CP SET EMSG OFF'
  'WAKEUP +2 (NOEXT SMSG FILE(WAKEUP)'
  sr=rc
  say "Retcode:" sr 'AT' date() time()
  select
      when sr=1 then exec 'ARCMND'
      when sr=2 then iterate
      when sr=3 then do
      PULL VAR1
      'DROPBUF'
      /* PARSE FIELD 4 FROM STACKED WAKEUP TIMES FILES LINE */
      PARSE UPPER VALUE VAR1 WITH ASTERISK REQNO FIELD1 FIELD2,
                                FIELD3 COMMAND
      IF COMMAND='MSG01' THEN DO
         'CP MSG OPERATOR THE TIME IS NOW:' TIME() 'ON' DATE()
         'CP SLEEP 3 MIN'
         END
      ELSE
      IF SUBWORD(COMMAND,1,1) ='CMS' THEN DO
         TASK=SUBWORD(COMMAND,2)
         SAY TASK
         ADDRESS CMS TASK
      END
      ELSE DO
        'DROPBUF'
        LEAVE
        END
      END
```

Practical application ideas for these tools

This was just a sample of three kinds of practical uses. Most are covered in my z/VM installation crash course.

In the past I have written entire applications in CMS (REXX and Pipelines)

VSE JCL server

COBOL code server.

Both with front end management tools and security as to who checks in/out. Who can submit to which system, and keeps multiple copies of each member for back out.

Have fun!

If you need any help setting these up on your system, give RSM a call.

Questions

Contact

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